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## Lincoln DAC Environmental Guidance

### Practical Steps to Achieving Net Zero

*“Caring for places of worship (buildings and land) with environmental integrity.”*

The Lincoln DAC is committed to encouraging best practice in all matters relating to church buildings and, increasingly, this includes environmental sustainability and energy efficiency. The DAC works within the [Lincoln Diocesan Environmental Policy](#).

The guidance notes on these pages have been prepared by the Lincoln DAC to encourage parishes to think about how they might apply best practice and do their part in moving towards net zero carbon by 2030. The DAC will expect parishes to have considered the [Church of England’s environmental target](#) before submitting future applications.

It is worth remembering many of our church buildings have stood for hundreds of years and, with regular maintenance, they will stand for hundreds more. They already embody significant amounts of carbon and resources in their fabric. It is important to note that the construction industry is one of the UK's biggest carbon emitters. So, it is essential, therefore, that we care for our existing historic buildings, with an increasing awareness that **the greenest building is the one that is already there.**

It is also worth remembering that churchyards are often biodiversity ‘hotspots’, and have become refuges for rare plants and animals. Even if they are not already assets of this type, they can become such hotspots with the introduction of simple management programmes and small-scale interventions.

Environmental improvements to churchyards are sometimes also grant-aidable, by many of the same funding bodies that grant-aid works to church buildings, such as the National Lottery Heritage Fund (NHLF), as well as by a range of charities that specialise in the natural environment.





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### Quick Wins

It doesn't matter whether you are a small rural parish or a large urban one there is always something you can do to save energy and reduce your impact on the environment. Here are a few suggestions to start:

- Regular maintenance of roofs, gutters and drains, this is a really important first step for all church buildings.
- Deal with draughts but remember that old buildings also need adequate ventilation, so please consult your architect. There is an interesting document, containing more information, produced by the [Society for the Protection of Ancient Buildings](#).
- Replace existing light fittings with LED lamps where suitable (see Frodingham example).
- Switch to 100% renewable energy tariffs and make sure you have not been paying the climate change levy (CCL) or more than 5% VAT on your fuel bills. Parishes may be entitled to refunds going back 6 years. Parishes may also be able to take advantage of the C of E [Parish Buyers Scheme](#) for energy suppliers.
- Match heating times to usage.
- Insulate heating pipes where appropriate.
- Clean and dust heater units ideally once a year.
- Add anti-freeze and anti-sludge filters to your radiator system.
- Behaviour changes – remember to switch things off and make sure timers are set correctly. Consider switching off wet heating systems 15 minutes before the service ends.
- Consider moving service and meeting times to suit weather/seasons. If they cannot be moved ask people to wear more suitable clothing.
- Use the Energy Footprint Tool as part of the online Parish Returns. There is a short [YouTube video](#) produced by the Diocese of Manchester to help you.
- Use A+++ rated electrical appliances.
- When felling trees in the churchyard a new tree can be planted in its place or as part of a tree planting scheme through the [Woodland Trust](#). You also need a plan for the disposal/reuse of any waste timber. Some of the wood could be stacked in a suitable area to help encourage biodiversity.
- When caring for your churchyard and its biodiversity please consider mowing schedules, hedgerow trimming (ideally once every 3 years), chemical usage, masonry care and planting of native species only. We recommend you look at the [God's Acre Project](#) for useful advice. Such works can attract grant-aid in some circumstances.

### A little More Thought

After the quick wins there are still plenty of areas where improvements can be made. The DAC are happy to assist with early advice on the following:



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- Improve zoning, install space thermostats and frost-stats (or 2 stage frost protection in large churches).
- Install thermal or motion sensors on external lights or walk-in storage cupboards.
- Get timers, smart controllers and smart meters.
- Replace gas or oil portable heaters with electric pew or panel heaters.
- Draught proof windows, replace broken glass and make sure hopper windows are repaired, if they don't fit correctly.
- Solar PV panels or small wind turbine where appropriate.
- New modern efficient gas boiler if nothing else is viable. FOR MORE INFORMATION ABOUT HEATING AND LIGHTING SEE NOTES BELOW.
- If considering floodlighting please question whether this is a suitable use of resources, how much light pollution it will cause and the impact on local wildlife?
- Offset some of your carbon footprint by means of [Climate Stewards](#).
- Positively encourage biodiversity within your churchyard. There are useful tips on the [God's Acre](#) website.
- Provide bike racks and shoe scrapers to encourage people to cycle or walk.

### **New Development Schemes**

For major works to a church building, we do advise that you contact the DAC at the earliest possible opportunity, so that we can assist and work with you to achieve the optimum outcome.

- Extensions or new buildings will have to follow current building regulations which will include all current eco requirements as a minimum standard. Your architect should ensure that all building materials and practices are as sustainable as possible.
- When considering new heating or lighting schemes **ensure that these are appropriately designed to give suitable heat output and lighting levels.**
- Under floor heating, if lifting floors, which can be left on a constant low temperature where the building is regularly used.
- Heat pumps (Air or Ground Source) or Biomass can be considered for larger buildings that are used frequently.
- Include measures to minimise waste water which will reduce pressure on local sewers.

Do remember that many grant-givers these days (including the NLHF) will ask you to consider making your larger development environmentally sustainable, and they will usually be willing to fund any extra costs that doing this might entail.

The following detailed information has been provided by our heating and lighting adviser who will be happy to discuss any issues raised as you develop your scheme. He can be contacted through the DAC Secretary.



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## HEATING SYSTEMS

Lincoln Diocese DAC supports and recommends the Church Building Council Guidance [“Review of Heating Guidance – January 2020”](#).

Parishes considering new heating systems or alterations and/or improvements to existing systems may find the following additional information of assistance:

1. Where new “wet” heating systems, heat pump or electric panel heater systems are being considered the designs and heat loss calculations must be based on data from the CIBSE Guide to Good Practice.
2. Designs for pew heating and radiant quartz systems should be designed by electric heating companies specialising in church heating.
3. Consideration should be given to low surface temperature systems.
4. Underfloor, radiant quartz and pew heating systems are easiest to zone.
5. Pipework for “wet” heating systems should be screwed steel or crimped steel.
6. Where new electric and/or heat pump systems are considered, the parish should check that their existing electric supply is adequate, making allowance for all other electrical requirements in the building. Where supply upgrades are required that should be agreed with the supply company prior to proceeding.
7. Where existing gas or oil boilers are to be replaced with modern efficient equipment, installers should check that the output of the new boiler is suited to the existing installed heating surface, with allowance made for pipework losses, heat-up etc.
8. When installing new boilers on existing systems the installers must follow boiler manufacturers advice with regard to plate heat exchangers, strainers, mag filters and system additives.
9. If the parish consider the heating system in the church to be inadequate a heat loss calculation (as in 1. above) should be carried out to establish if installing additional heating surface is necessary and practical. The additional load should be added to the boiler output.
10. Where visible pipework systems are altered new pipework should match the existing. (If cast iron pipework is amended then the new pipework should be screwed steel).
11. All pipework not providing useful heating surface should be insulated. However, where new high efficiency gas boilers are installed in damp basements some pipework could be left unlagged to help protect the boiler.
12. Parishes should check that all programmers, time switches, thermostats, boiler thermostats etc are set correctly to suit the occupation times of the building.



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13. Frost thermostats should be set to 4°C to protect heating and other piped services. In very large churches (say, boiler power 180kW plus) 2 stage frost protection might be considered. Stage 1 – pumps operate at 4°C. Stage 2 – boilers operate at 2°C).
14. Where temporary electric heating has to be used, beware of trip hazards and high surface temperatures. Temporary Calor Gas heaters are not acceptable.
15. Faculty applications should include sketch plans indicating plant and equipment locations, flue arrangements and pipework routes. The DAC may also request copies of the heat loss calculations.
16. **The key to modern efficient heating systems is good design.**

## LIGHTING SCHEMES

Lincoln Diocese DAC supports and recommends the [Church Building Council Guidance Note for Church Lighting](#).

**Parishes considering new lighting schemes may also find the following of assistance:**

1. Prior to discussing any new lighting scheme, or improvements to existing systems, parishes should have a clear idea of their requirements prior to discussions with designers. For example, do they require a basic lighting scheme or something more elaborate?
2. For basic schemes the light levels should be in the order of 200lux in the Nave, 250lux in the Chancel and 300lux in the Sanctuary. Task lighting may then be appropriate for the Font, Pulpit, Lectern, Organ etc, plus lighting to special features.
3. Modern lighting systems would normally be based on LED fittings and lamps, with separate circuits and dimming facility to allow flexibility of use.
4. Many churches have high and ornate roofs, so uplighters can create a feeling of space and draw attention to the roof.
5. Consideration should be given to emergency lighting, particularly churches which have regular concerts or community use. This allows safe exit from the building in the event of power failure. Emergency lighting also allows safe exit from Ringing Chambers and the like. Ideally, on new schemes, emergency light fittings should be incorporated into the standard fittings. Hideous battery-operated car headlights are not acceptable on new schemes.
6. If some form of “theatre lighting” is required for concerts and the like, consideration should be given to ensuring power is available for temporary lighting rather spending on infrequently used lighting.



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7. Parishes should avoid where possible LED fittings which do not have replaceable lamps. Apart from the cost of fittings, styles and fashion change and replacement fittings may become a problem.
8. It may be possible to replace tungsten or similar lamps with LED lamps. Prior to purchasing the LED lamps parishes should check the suitability of the existing fittings.
9. On new schemes parishes should request sample fittings to be temporarily installed to check suitability and parish satisfaction.
10. It is essential that new lighting schemes are correctly designed to allow satisfactory light levels and ease of maintenance. Lighting designers and consultants are available but, particularly on smaller churches, well designed schemes can be achieved from light fittings manufacturers thus saving the cost of design fees.
11. External access lighting should be operated by PIR controls.
12. The need, design, operation and colour of external flood lighting should be carefully considered to avoid light pollution with operation limited to 11.00pm, subject to local Planning Consent requirements.
13. Lighting schemes must conform in all respects to current Electricity Regulations.
14. Internal wiring to be carried out in “FP200” cable, or similar approved. The installation must be installed by commercially registered “Full Scope” electrical contractors. Architect’s advice may be required for cable routes.
15. When applying for a faculty the DAC will require a sketch plan indicating light fittings location and cable routes. Indication of light level to be achieved in the various areas together with illustrations of the fittings.
16. **LED fittings will substantially reduce running costs. The key to modern, efficient and effective lighting installations is good design.**

**Below are links to other information that you might find useful:**

[Historic England guidance on Energy Efficiency in historic buildings](#)

If you need specialist advice for heating and lighting schemes you can look on [CIBSE Find A Specialist](#).

We encourage you to register and get involved with [A Rocha’s Eco Diocese & Eco Church Awards](#) scheme (as mentioned in the Lincoln Diocesan Environmental Policy Document) and you might like to look at their [questionnaire](#) as a toolkit for change in your church.

[SPAB Briefing Energy Efficiency in Old Buildings](#)



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For contractors with relevant experience in dealing with old buildings:

[Building Conservation Directory](#)

or

[Institute of Historic Building Conservation Directory](#)

### **Any Other Ideas?**

The DAC would welcome any energy saving or eco tips that our churches would like to share with others. Who knows, your church may even feature on the diocesan website as an example of good practice! We aim to keep our guidance under constant review and we hope to share examples of good practice and innovation.

If you have any queries or ideas that you would like to share with us please contact, in the first instance, the DAC Secretary on 01522 504069 or email:

[Steven.sleight@lincoln.anglican.org](mailto:Steven.sleight@lincoln.anglican.org)

### **What will the DAC be doing to reduce its carbon footprint?**

We will be holding more of our meetings on Zoom to cut down on travel costs and fuel as well as sharing car journeys when attending site visits. Where possible we may incorporate meetings during visits if there are appropriate facilities. We have also been printing less paperwork and reading documents online instead.

Finally, a pause for thought:

‘ it is...likely that we will have either to live within our limits, within the human definition, or not live at all. And certainly the knowledge of these limits and of how to live within them is the most comely and graceful knowledge that we have, the most healing and the most whole.’

*(From an essay entitled The Use of Energy – in The Art of the Commonplace 2002 by Wendell Berry)*

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