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One of the most important challenges facing churches today is providing sufficient comfort for the many different users of the building, from worshippers to staff to visitors. Achieving this whilst cutting our greenhouse gas emissions and conserving historic interiors creates specific technical challenges for church buildings.

A church's heating system affects its fabric, its contents, its congregation and its mission. Heating makes up the vast majority (over 80%) of its energy use and carbon footprint. Heating costs money to run, maintain and replace.

There is no universal solution to making a church comfortable and the key to arriving at a solution that provides reasonable comfort at a



significant time and effort to understanding the particular needs of your own

# About our guidance

We are in the course of updating our church heating guidance. We have divided our guidance into a suite of short stand-alone sections. Pick out the section you need, or read all of them from start to finish. We will add more sections as they are ready.

### **1. Heating principles**

The way our churches are heated is vitally important, for comfort, for the climate, and for conservation. It can also be complicated, with a variety of sometimes conflicting objectives.

To help guide dioceses and churches through this, a set of principles was agreed by the Church Buildings Council in February 2020.

These aim to help staff, both centrally and in the dioceses, develop their heating guidance.

The principles can also help individual churches when thinking about their own heating.

These principles include:

- That there is no one-size-fits all solution.
- To start by optimising what you have and reducing heat loss.
- Balancing comfort, minimising harm to historic fabric, affordability, feasibility, and, last but certainly not least, reducing greenhouse gas emissions, which contribute to the climate crisis.
- The need for an options appraisal, that at least considers options to move away from fossil fuels.
- The need for consultation and advice.

[Download Section 1 Heating Principles here](#)

### **2. Heating perspectives**

When you start discussing replacing your heating, you will find different people within the church community have different points of view, and so may the experts you consult. This can be confusing.

This short guidance note aims to help you think about your heating decisions from different points of view, early on in your planning process. It will help you look at your heating system from the perspective of your church users, churchwarden, and church treasurer, from an environmental perspective, a conservator's perspective, and more.

It finished with a theological perspective, linking choices about heating to our mission to care for creation. *"In the struggle for climate justice, everyone must play their part, through prayer and personal action, but also through the practical choices we make about how to heat our buildings. The decisions made about buildings are just as worthy of prayer as more directly missional issues; they will not only address the comfort of those who visit our buildings but affect those elsewhere whose future will be impacted by how rapidly decarbonisation occurs."*

[Download Section 2 Heating perspectives](#)

### **3. Heating approaches**

There are a wide range of approaches to heating, from space heating the whole church right through to no heating at all. They combine different objectives,

different heat sources (such as oil, gas, and electricity) and different heat emitters (such as radiators, panels, and underfloor heating).

Each combination has different pros and cons, and will be suitable in different circumstances. There is no 'one-size-fits-all'. Before choosing a new system it is vital to think through the possibilities, using an options appraisal.

The usage and nature of some churches will suit pew heaters or infrared electric panel heaters, whilst others might suit heat pumps, perhaps running to underfloor heating, and others might suit conventional space heating with radiators.

This short overview sets out the main heating approaches a church can consider.

### [Download Section 3 Heating Approaches](#)

#### **4. Decarbonising and the future of heat**

When planning a new heating system, you need to keep the future in mind. How will the climate change? Which new technologies will become effective and affordable, and which current technologies will become redundant? What sources of funding might come, if we wait? And what changes will be driven by future regulation?

We know that decarbonising heat is vital. Around a quarter of the total UK's greenhouse emissions come from central heating, so to meet net-zero we need to reduce the emissions released by burning gas, oil, and other fossil fuels.

So, what might be "the future of heat"? There is no one answer to this. Experts see four main approaches to decarbonising heat; electrification of heating (especially using heat pumps and hybrid boilers), a switch from natural gas to hydrogen and/or to biogas, and district heating. The final answer is likely to be a combination of all four, to different degrees, in different locations.

### [Download Section 4 Decarbonising and the future of heat](#)

#### **5. Heating checklist**

Before you go any further with a heating project, you should carefully review your current situation.

Download and use our heating checklist to record your information, and then discuss the results with your PCC. The checklist covers:

- **PEOPLE: What do users need, now & in the future? What causes discomfort?**
- **SYSTEM: What do we have now, and what needs changing? How long will it last?**
- **BUILDING FABRIC: Where is there heat loss and can we reduce it?**
- **PERFORMANCE: How well do the people, systems, and building interact?**
- **LISTING AND INTERIORS: What fragile or precious objects/materials do we have, and what needs special care?**
- **ENERGY USE: What is our current energy use, utility cost, and carbon footprint?**
- **MONEY: What budget do we have for up-front capital, for maintenance over time, for running costs every year, and for future replacement?**
- **CONSTRAINTS: What connection do we have to utilities? What space constraints are there?**
- **ADVICE: Who can we ask or commission for advice?**
- **CONSULTATION: Who do we need to involve, and when?**
- **OBJECTIVES: Overall, how important are factors to us?**
- **CONCLUSIONS**

When using the checklist, only answer those questions which are relevant to you. If you don't know the answer to something, keep going and complete the parts you can, then revisit the trickier parts.

When you commission advice, from a heating advisor or your DAC, show them your completed heating checklist, so they quickly understand your situation, and can give you tailored advice.

## [Download Section 5 Heating Checklist](#)

### 6. Heating pitfalls

This section of our guidance helps you learn from pitfalls that have caused others to make costly mistakes. Hopefully, it will help you chart a smooth path.

Heating systems are a major investment for any church, and so making the correct decisions, both about when to make changes and what changes should be made, are important to get right the first time. The right solution for one church can be totally wrong for another. And once you have a system, running it properly can also go awry.

So, what are common pitfalls, and how can you avoid them? This section of our guidance covers;

- Pitfalls in how church heating is approached, such as not asking the right questions, or not getting the right advice
- Conservation pitfalls: causing more harm than good, such as unstable heating, damaging stonework, or damaging the church organ
- Pitfalls with controls and settings, such as a lack of controls or faulty thermostats
- Pitfalls with particular components, such as pumps and radiators
- Pitfalls with aesthetic decisions, such as flue placement
- Pitfalls with frost management, and finally
- Pitfalls with health and safety.

## [Download Section 6 Heating pitfalls](#)

### 7. Options appraisals, and getting advice

Assessing the options open to you is key to any heating project.

First, you need to work out what you need your heating to **do** for you; the checklist in Section 5 should have helped with this. It may seem obvious, but thinking through where and when you need warmth is vital. We suggest you read the earlier sections of the guidance and complete the checklist **before** starting your options appraisal.

The next step is to narrow down the range of available options to create a shortlist by eliminating the ones that are not feasible.

Then you assess the remaining options to see how well they meet your needs (now and in the future), their environmental impact, their cost both now (installing the heating) and over time (the cost to maintain and run the heating), plus how long the system can be expected to last.

For some projects, you will need expert advice and detailed reports. For some projects, two sides of A4 may be enough. Knowing when to get expert input and from whom is vital.

## [Download Section 7 Heating Options Appraisals](#)

### 8. Heating Permission and Regulations

Carrying out work on heating systems, whether they be electric, gas or oil, needs to meet certain standards. The professionals and installers who you employ to work at your church should have certain qualifications or accreditations, so you can trust their work meets these standards.

Changing to a new heating system will often require faculty permission (from within the Church of England) and sometimes planning permission (from your local planning authority). Particularly large projects may also require Building Regulations sign-off, although most smaller work will be self-certified by the tradespeople involved.

This section of our heating guidance outlines the key points of which you need to be aware. It does not aim to cover how to make a faculty or planning application, but only to alert you as to when it is required. More information on the faculty system is available through our "[How we manage our buildings](#)" webpage

### [Download Section 8 Heating Permission and Regulations](#)

#### **9. Heating Costs and Funding**

This section of our heating guidance aims to help you consider the relative costs of heating projects. It can only talk in broad brush terms, since costs will vary enormously from project to project, depending on the size of the church, the size and nature of the system being installed, the existing gas and electricity grid connections, the fittings chosen, and many other factors.

Instead of putting specific costs against each one, we instead highlight relative costs, and give examples.

After this, some pointers on routes to funding are given. Far more information on this sits on the Church of England [Environmental Fundraising page](#):

### [Download Section 9: Heating Costs and Funding](#)

#### **10. Temporary Heating Options**

When a church's heating system breaks, rushing to replace a broken gas boiler with a new gas boiler may appear to solve the immediate problem, but it is often a missed opportunity to improve the way a building is heated. To ensure low carbon options are at least considered, the updated faculty rules (from July 2022) require an options appraisal and faculty permission for like-for-like boiler replacements. The PCC will need time to think about how the building is used, how it should be heated, and whether there is scope for reducing the building's carbon emissions.

During this period, a temporary heating solution may be needed.

Before committing to any temporary solution:

- Speak to your insurance company about your plans.
- Check with your Archdeacon or DAC Secretary to see if permissions are required. In general free-standing, plug-in units do not require permission, but anything attached to the building may do.
- Many churches are large and with high roofs. Think about temporary solutions which heat the people, rather than the building, in order to keep carbon emissions and running costs low.

### [Download Section 10: Temporary Heating Options](#)

## **Download our guidance**

[Heating Principles](#)

[Heating perspectives](#)

[Heating Approaches](#)

[Decarbonising and the future of heat](#)

[Decarbonising and the future of heat](#)

[Heating Checklist](#)

[Heating Pitfalls](#)

[Heating Options Appraisal](#)

[Underfloor heating](#)

[Frost Protection Guidance](#)

[Heating Permission and Regulations](#)

[Temporary Heating Options](#)

[Heating Costs and Funding](#)

## **Case Studies**

### Heat Pumps

The 'net zero carbon' case studies page includes examples of projects where heat pumps have been fitted. [Newcastle Cathedral](#) opted for air source heat pumps on a section of the roof, whilst [Chorley St Lawrence Primary School](#) installed a ground source heat pump in its playing fields.

To find more heat pump case studies, see 'Further Case Studies' below.

### Biomass

Learn about the work done to install a biomass boiler at [St Stephen's Bowling](#).

To find more biomass case studies, see 'Further Case Studies' below.

### Alternative Electric Heating Solutions

Our case studies cover a range of innovative heating solutions, including; over-head and under-pew heaters at [St Andrew's Chedworth](#), heated cushions At [Marown](#), and infra-red chandeliers at [St Catherine's Preston-next-Faversham](#).

To find more examples, see 'Further Case Studies' below.

### Further Case Studies

To see the full range of examples, please visit the [Case Studies Page](#)

## Other resources



- Our [extensive programme of net-zero church webinars](#), including videos of all past topics, covers church heating.
- [Contact your DAC](#) to ask to speak to your DAC heating or sustainability advisor. More and more dioceses now have them.
- The [Chartered Institution of Building Services Engineers](#) maintains a register of consultants working in the heating industry.
- Contact your [Diocesan Environment Officer](#).

## Send us your feedback

Heating is a complex and rapidly changing topic, so we are very interested in your feedback on our new guidance.

If you spot anything that needs fixing or isn't clear, [please contact us](#).

## Also of Interest



## Net Zero Carbon Church Guidance



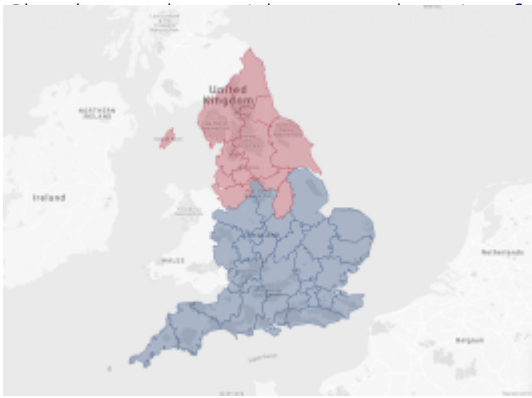
[net zero carbon at your church](#)

## Net Zero Carbon Webinars



[on getting started to solar panels](#)

## Historic England Guidance



[om Historic England](#)

## Find your Diocesan Environment Officer

[Find the details of your local DEO, there to help you](#)

