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 reasonable cost and reasonable environmental impact is to devote sufficient time and effort to understanding the particular needs of your own church.

UPDATE Jan 2021 - Churches closed due to COVID may wish to review their frost protection and ensure it is sufficient and correctly set. Frost protection guidance is attached below.

We are in the course of updating our church heating guidance (as of February 2021). 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.

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.

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.
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 lock 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.

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.

### 11. Case studies

Download and read case studies here for:

- Chalgrove Church case study of electric heating
- Case study St Andrew's move away from oil heating to electric heating
- Case Study St Mary Willesborough successful underfloor heating
- Case Study Ground Source Heat Pump St Mary the Virgin Ashford

You can also find our Net Zero Carbon case studies here, which include electric heating at St Michael's Baddesley (pew heaters), St Michael's and All Angels Withington (pew heaters), and Holy Trinity Church Whitfield (heated pew cushions).

We are always looking for more case studies, so if your church has taken action please get in touch.

**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.

**Other resources to help you:**

- 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.

**Download our guidance**

- Heating Principles
- Heating perspectives
• Heating Checklist
• Underfloor heating
• Chalgrove Church case study of electric heating
• Case study St Andrew’s move away from oil heating to electric heating
• Case Study St Mary Willesborough successful underfloor heating
• Case study Ground Source Heat Pump at St Mary the Virgin Ashford
• Frost Protection guidance

Also of Interest

A diagram showing the outside of a net zero carbon church.

Net Zero Carbon Church Guidance

Find advice on how to move towards net zero carbon at your church

Diocesan Environment Officers holding up banners with the fifth mark of mission

Net Zero Carbon Webinars

Find free webinars on everything from getting started to solar panels

Net Zero Case Studies

Get inspired by churches that have already taken action
Find your Diocesan Environment Officer

Find the details of your local DEO, there to help you

Source URL: https://www.churchofengland.org/resources/churchcare/advice-and-guidance-church-buildings/heating