

DIOCESE OF CHELMSFORD

DIOCESAN ADVISORY COMMITTEE



CHURCH HEATING

GUIDELINES TO ASSIST PARISHES

Revised December 2014

CHURCH HEATING

INTRODUCTION

- 1.1 Church heating has been a perennial topic between clergy, PCCs and parishioners for many years as the perfect solution is sought. In spite of the introduction of new methods of heating and new technology to control old ones, this debate seems destined to continue and there is very seldom a perfect solution to meet the diverse needs of individual congregations and building.
- 1.2 Responsible PCCs will wish to consider the costs over the expected life of the system, taking into account the capital cost, running costs and the regular servicing and maintenance required. When considering replacement or modified systems an assessment should be undertaken to determine if any elements of the existing installation are suitable for further use.
- 1.3 Expert advice is always available but care must be taken when assessing information received as there are many vested interests in the market place. It is always wise to seek the advice of an independent specialist, your church architect, or the “in house” DAC Heating Advisor. The DAC will expect the name(s) of professionals consulted to be shown when an application is made for a DAC certificate of recommendation.
- 1.4 Before committing the parish to what might seem the right solution, the PCC should undertake an assessment of the regular patterns of worship and other uses to which the building is put throughout the week.
- 1.5 Many of our churches are listed buildings containing ancient fabric and are, by their very nature, difficult to heat in a way which is not invasive to ancient fabric. Many historic and irreplaceable items including furniture, organs, hatchments, paintings and memorials can be damaged if exposed to excessive heat and the effects of condensation. Condensation can normally be dispersed by adequate ventilation of the building.
- 1.6 During the planning stages the PCC should consider the implications of the proposed installation on the aesthetics of the building.

- 1.7 In considering the costs of installation, running and maintenance, the beneficial effect that regular background heating will have on the building fabric should not be ignored. However, for occasional usage local “small area” heating is often more efficient.
- 1.8 It is acknowledged that there are very rarely easy answers and that, in some instances, a compromise may be the only solution. Consultation with the DAC Heating Advisor at an early point in the planning stage is recommended, as solutions to similar requirements may have been overcome by other parishes. We are also often able to recommend churches that can be visited to see installed systems. The aim of the DAC will be to help the PCC to choose a heating system which provides as comfortable a level of warmth as possible whilst taking account of the particular features of the church.
- 1.9 Portable gas heaters are not recommended by the DAC. They present a significant safety hazard to all, especially the young and old, are expensive to run, and also create condensation.

CHOICE OF FUEL

- 2.1 There are generally four choices available: natural gas, liquid petroleum gas (LPG), electricity, and oil. Renewable sources of heating (woodchip, heat pump, solar panels) may be appropriate in some circumstances.
- 2.2 Not all fuels will necessarily be available to every church, especially in rural areas, and this may restrict the choice of system.
- 2.3 In today’s very competitive marketplace with many suppliers vying to provide the same fuel, prices can be volatile and it is strongly recommended that your needs are discussed with more than one supplier. In some instances better terms can be achieved by aggregating adjacent buildings (**e.g.** church and hall) together. This does not require you to change to one meter.

FUEL/SYSTEM COMPARISONS

| | COST | | ADVANTAGE | DISADVANTAGE |
|---|--|--|---|---|
| | INSTALLATION | RUNNING | | |
| Gas (Natural) | High | Low | Storage not required | Not available in some areas. Regular maintenance required. |
| Gas (LPG) | High | High (linked to oil prices so fluctuate) | Self-contained | Need to maintain stock on site, including rental cost. Regular maintenance required. |
| Electricity | Low (Excluding electrical boilers.) | High | Simple installation with minimal maintenance costs. Suitable for limited hours of use. | Some units unsightly and can be ineffective |
| Oil | High | Medium (prices fluctuate) | Self-contained. Suppliers may offer incentives to install the system | Storage tanks can be unsightly and prone to vandalism and theft. |
| Renewables (wind, solar, wood chip, heat pump) | Depends on system | Low (wind & solar would need standby back up) | Environmentally friendly. | Depends on system |
| Solid (i.e. coal) | High | Low | | Not generally viable High carbon footprint. |

In reality it is expected that the majority of schemes proposed will utilise mains gas or electricity.

HEAT SYSTEMS

4.1 Brief summary of systems in common use with some of their advantages and disadvantages:

- a) Storage (Electric) Suitable to provide background heating. Instant heat not available. Cheaper Economy 7 tariff but only viable for regularly used premises.

- b) Infra Red (Electric) Mounted above head height provides instant heat over a small area. It may result in hot heads and cold feet for the congregation. Often obtrusive, affecting the sight lines of the building. Many types produce a red glow, which is not generally acceptable. Some ceramic heaters do not produce any visible light and are preferable. Mounting heights and spacing between heaters are important and some systems require periods of pre-heating.
- c) Panel/Tubular (Electric) Localised application, typically pew heating. It is often prudent to have such installations wired so that the heating can be zoned throughout the church. Such installations can have separate switches to each pew, giving flexibility for control, depending on the size of the congregation. Tubular heaters are generally not preferred, but if used should be shielded as they run very hot. These systems are best used in premises which have low periods of use.
- d) Underfloor (Electric, Gas and Oil) Suitable for churches in constant use throughout the week. Complex installation requirements are often better undertaken as part of a major church refurbishment. Electric underfloor heating can be connected to heat pumps, preferably air sourced for capital cost purposes, which brings the running cost down similar to a mains gas system.
- e) Waterborne (Electric, Gas and Oil fired boilers) Radiator systems, similar to domestic use, may require more complex control systems and radiators sensitive to the needs of the building. As an alternative to radiators, fan assisted heaters with water heated elements will facilitate a more rapid heat-up period
- f) Ducted Forced Air (Electric or Gas) These heaters are effective in warming the air in the church with minimal heating effect on the fabric. These individual units are available in varying types and sizes and although they can be effective when occasional heating is required, they can present installation problems requiring invasive access holes in the fabric of the building. Such form of installation is unlikely to be compatible with the fabric of many of our churches. The larger units can also present a serious noise problem from the fan units which can sometimes be overcome by running the fans at a lower speed. When larger units are being considered the advice of a heating engineer is considered essential. Un-ducted warm air systems should be avoided as they produce high levels of condensation.

OTHER CONSIDERATIONS

- 5.1 Energy efficiency can be managed by sophisticated controls. Investment in a good control system will save money in the long run. Web-based monitoring and control is becoming increasingly viable and enables temperatures to be linked more closely to occupancy periods and levels. With any control system consideration should be given to zoning to suit building usage, for instance early morning services are often sparsely attended.
- 5.2 There may be an old system which will need to be removed before the new one can be installed. Boiler houses need special consideration if they are to become redundant when the new heating is installed. Applications for a Faculty should also include details of the work relating to the decommissioning of the old system. Often the main requirement is just to replace old boiler plant, retaining the existing distribution and heaters. New boilers whether gas or oil fired are more efficient, but are much less robust than the old boilers they are replacing. Strong consideration should be given to isolating the new primary boiler installation from the old system by means of a plate heat exchanger. This adds to the cost initially, but reduces the danger of early replacement of the new boiler plant. Typically the life expectancy of a condensing boiler is around half that of the boiler it is replacing. Care should be taken in cleaning the old pipework and heat emitters as a power flush can dislodge old scale and deposits, exposing the system to leaks. Filtration should be provided on the secondary side to reduce the deposits of sludge in the heat exchanger, which will need periodic cleaning.
- 5.3 There may be archaeological and structural implications during the installation of some systems. The costs associated with such work should be borne in mind during the costing of the project. This can have significant impact when underfloor heating is being considered.
- 5.4 Consider the implications of the system for future generations. Try to design a system that will have minimal effect on how the building can be used now and in the future, and that can be modified and replaced with the minimum of disruption.

SUMMARY

- 6.1 Expectations regarding the temperature expected in a church vary between congregations. As an indication, an internal ambient temperature of 16/18°C when the external temperature is -2°C, gives sufficient comfort. Once installed it is often difficult and expensive to change to an alternative system. It is essential that the choice of a system is not rushed early in the autumn to satisfy the needs of the coming winter.
- 6.2 The aim of the DAC will be to help the PCC to choose a heating system which provides as comfortable a level of warmth as possible whilst taking account of the particular features of the church.
- 6.3 A Faculty application will be necessary and the details of the system design and details of the equipment to be installed will be required when the application is made for the issue of a **DAC 'Notification of Advice'**.
- 6.4 The selection of the contractor to carry out the work is very important.

If the installation is gas fired then the minimum requirement is a contractor with all Gas Safe qualifications for the type of installation in question.

In the case of a waterborne system it would be preferable to employ a contractor who is a member of the Building & Engineering Services Association.

If it is an electric system then the contractor should be a member of the Electrical Contractors Association.
- 6.5 There are some useful websites which can be used to compare fuel costs or to look at detailed comparisons of different systems, and the links are given below.

REFERENCES

Please note the links below are current at time of printing, we cannot guarantee they are still available or up-to-date.

BUILDING & ENGINEERING SERVICES ASSOCIATION -

<http://www.b-es.org/>

ELECTRICAL CONTRACTORS ASSOCIATION -

<http://www.eca.co.uk/>

OTHER LINKS YOU MAY WISH TO ACCESS: -

<http://www.confusedaboutenergy.co.uk/>

<http://www.churchcare.co.uk/churches/guidance-advice/looking-after-your-church/heating>

<http://www.london.anglican.org/kb/generic-building-solutions/>

(Go to bottom of screen page and click on resources 'options, challenges, solutions, limitations')

POLICY

- 1.** To create an environment in which worship and fellowship can take place without compromising the fabric of the building.
- 2.** To ensure that installed systems are energy efficient and that the future maintenance costs have been budgeted for and can be met by the congregations.
- 3.** The DAC will expect any proposed scheme not to affect adversely the fabric, character or appearance of the building.

FOR YOUR NOTES

This is one of a series of guidelines published by the Diocesan Advisory
Committee

Copies can be downloaded from the Diocesan website:

www.chelmsford.anglican.org/parishes/dac/dac_notes

or can be obtained from the
DAC Secretary at the address below

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