

Radiant Heating Trial, St Matthew's, Bristol



This case study considers only one possible approach, which may not be suitable for every church. Always seek professional advice.

Key Points

- A trial of innovative radiant heating and lighting chandeliers which sought to address the shortcomings often associated with radiant installations in churches.
- The trial was the subject of an independent evaluation of performance and impact on fabric, including feedback from the congregation.
- The evaluation confirmed that good levels of comfort can be provided in areas directly heated by the units, reducing energy use and carbon emissions. When positioned correctly they appeared to control the conservation risk to historic fabric. The application has the potential to be a viable heating solution, or part of a heating solution, in similar churches.



1 The view facing east from the organ showing the four chandeliers in operation.

2 A close-up image of a Halo chandelier.

3 Thermographic (IRT) image. Temperatures increased by 10°C to approximately 20°C after only 20 minutes below the units.

The context

St Matthew's is typical of many churches in that its main worship space has a large volume and mass, and low thermal performance, presenting a familiar heating challenge. With a relatively efficient gas central heating system for comparison, the church was a good candidate for the heating trial.

For more information visit the [church's website](#).

The need for change

The need for change was one shared by a lot of churches – the commitment to decarbonise with the aim of achieving net zero by 2030, when the available low/zero carbon options for church heating typically require huge capital investment and often higher running costs (in the midst of an ongoing energy cost crisis).

What were the options?

Prior to the trial St Matthew's had considered heat pumps, solar thermal/PV/PVT, as well as various means of improving thermal performance using convective systems, all proving beyond their financial means. The invitation to host the radiant heating trial was therefore of considerable interest with the prospect of providing a heating solution that might prove to be a viable, affordable way forward.

What was done?

Four of the church's six lighting chandeliers were replaced with 'HALO' radiant heating and lighting chandeliers. The all-new, purpose-designed fittings are based on a standardised format (and hence allow an economy of scale) but with bespoke options for finish (colour, laser-cut detailing, light fittings, etc.). They house 'far infrared' ceramic heat emitters that deliver invisible radiant heat in a diffused manner, at a wavelength similar to the energy emitted by humans. Unlike most earlier church radiant systems, the heating effect is much gentler. They heat the people, objects and floor below the chandeliers, which in turn re-emit heat, giving the sensation of a 'bubble of warmth'.

How well does it work?

The effect is similar to space heating, but without the need to preheat the whole mass and volume of the building. The radiant heat is 'on demand' and almost instantaneous. In the trial, St Matthew's found that turning on the heating was as simple as turning on the lights before a service. The post-installation study identified a benefit of turning the units on, no more than 20 mins before the building was used.

The independent report ([link](#)) found the system performed well in terms of technical comfort levels and perceived comfort by the congregation within the exposed heating cone.

The unexpected outcome of the trial was the reduction in energy cost.

Andrew Wood, Treasurer at St Matthew's, said: "The chandeliers are clearly different, but people have felt warm even throughout the coldest period back in January. For us, the costs can be as low as £10 per Sunday service to run the radiant heaters for one to two hours. In comparison the gas system, which must run on full for many hours in advance of a service, could be costing us up to £100 per service on cold days."

How much did it cost?

The estimated cost of the trial installation was around **£35,000** which is considerable, but not dissimilar to a typical central heating replacement and, for St Matthew's, a fraction of the estimated cost of options such as heat pumps. Unlike most other forms of heating the systems it is 'solid state' with no requirement for annual servicing or gas certification. Being both visible and low/zero carbon, the system is likely to be attractive to grant-giving trusts.

St Matthew's plans to make the installation permanent, and to replace the remaining two light fittings with the new chandeliers.

"In the context of a cost of energy crisis, this could save a lot of money and enable church buildings to stay financially viable. In the context of a climate crisis, this could be a huge step towards net zero - a means by which parishes can act to make a real difference to the planet."

The trial was St Matthew's only heat source for worship throughout the winter, and they have enjoyed comfort and reduced bills as a result. The greater benefit has been carbon reduction and the sense of positive action to care for God's creation.

Canon Simon Pugh-Jones, Chair of the Bristol DAC