

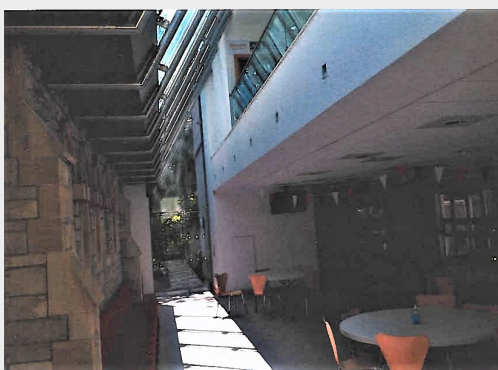
CASE STUDY AIR SOURCE HEAT PUMP PROVIDES PRIMARY HEATING FOR MODERN, ENERGY EFFICIENT CHURCH HALL



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

Key Points

- Within their new, state-of-the-art church hall, Christ Church installed an air source heat pump as the primary form of heating.
- With the building constructed to high energy-efficiency standards, the heating bills are much lower than before, despite increased use.



1 The 20kW air source heat pump runs on electricity to draw warm air from the outside to keep a constant temperature inside the new building.

2 Across 2 storeys, the new church hall consists of 6 rooms providing ample space for community use for a range of activities.

3 The new hall (right) is connected to the church building via a modern glass atrium.

The context

Christ Church was built in 1913 and sits within the Westbourne Conservation Area in Bournemouth. A timber-framed hall was added at a later, unknown date.

For more information visit the church's [website](#) or see its entry on the [Church Heritage Record](#).

The need for change

By 2010, it became apparent that the church hall was no longer fit for purpose and a new building was sought.

What were the options?

The church appointed an architect and a quantity surveyor, and produced a brief outlining the need to consider energy efficient forms of construction and heating.

This led to a number of options, all of which would have their own benefits. However, ultimately air source heat pumps emerged as the most suitable.

The primary reason for this was that, in its relatively urban setting, Christ Church lacked the space within its property for a ground source heat pump to be installed.

The option of a biomass boiler, with the need for additional bulky infrastructure such as a fuel store, was subject to the same issue, as well as higher maintenance requirements.

What was done?

- Although the initial scheme proposed included a higher than expected financial cost, it was seen that the opportunity to create an innovative hub for the community was worth it.
- A six-room, two-storey modern church hall was constructed.
- A 20kW air source heat pump was installed, with a 500 litre buffer cylinder.
- A gas boiler was also added, to provide a back up source of heating during the coldest parts of the year. The heat pump is docked to this, meaning that heat pump can operate up to the peak of its capacity before calling on the boiler for support, achieving optimal efficiency.
- These are both linked up to underfloor heating and traditional radiators.

How well does it work?

Where the previous hall was used two days a week on average, the new building, with its increased size and more comfortable conditions, is used daily.

The gas boiler is only required one or two days per year.

How much did it cost?

- Despite the total project costs amounting to £1,600,000, the church decided to predominantly fund the project internally.
- This funding involved 5-year interest-free loans from members of the congregation.
- A phase I scheme was designed within a budget of £700,000, which would provide the shell of the hall and a completed ground floor. However, when the first day of community collection raised £250,000, it encouraged the church that it would be possible to see the whole project through.
- Christ Church also arranged to borrow £500,000 from Stewardship Organisation.
- The new air source heat pump system cost £21,260.
- In the first year, gas and electricity costs for the church were reduced by £5000, despite the increased use compared to the previous hall.

“The final completed project was considered a great success coming within budget and meeting the fellowship needs. The use of the new heating installation was also well appreciated with so little attention needed, the system being on 24/7 and 365 days a year giving constant even temperature at all times and still very cost effective all year round.”

Richard Hackett, Project Manager