



General Trustees

The Property Holding Arm of The Church of Scotland

**A PRACTICAL PATH TO
“NET ZERO”
FOR OUR BUILDINGS**



These recommendations aim to help reduce energy use and associated carbon emissions. Not all of the suggested interventions will be appropriate to every building. Seek advice from Presbytery, your Presbytery Buildings Officer (PBO) and the General Trustees (GTs) prior to instructing works. Some of the measures will require a building warrant, planning permission, listed building consent or ecclesiastical exemption. If the interior is of historic, artistic or architectural interest, seek GT advice first. Stabilising the environment for these interiors is important to minimise cycles of treatment, with their inherent carbon cost. This checklist has been produced by the Church of England and adapted for the Church of Scotland. Links to further information can be found at the foot of this paper.

A. Where do we start?

These are actions that nearly all ecclesiastical buildings can benefit from, even low occupancy buildings used only on a Sunday. They are relatively easy, with relatively fast payback.

They are a good place to start, when trying to move towards 'net zero'.

The building itself:

- Maintain roof and gutters, to prevent damp entering the building and warm air escaping. See **SPAB Calendar**.
- Fix any broken window panes* and make sure opening windows shut tightly, to reduce heat loss.
- Insulate around heating pipes to direct heat where you want it; this may allow other sources of heat to be reduced in this area. Note, be careful not to insulate pipes which are designed to emit heat.
- If draughts from doors are problematic, draught proof the gaps* or put up a door curtain*.
- Consider using rugs/floor coverings (with breathable backings) and cushions on/around the pews/chairs.

Heating and lighting:

- Switch to 100% renewable electricity, for example through The Church of Scotland General Trustees Centrally Procured Energy scheme. For details on the scheme contact: GTenergy@churchofscotland.org.uk
- Match heating settings better to usage, so you only run the heating when necessary*.
- If you have water-filled radiators, try turning-off the heating 15 minutes before the service ends; for most churches this allows the heating system to continue to radiate residual warmth*.
- Replace lightbulbs with LEDs, where simple replacement is possible.
- Replace floodlights with new LED units.
- If you have internet connection, install a HIVE- or NEST-type heating controller, to better control heating.
- If your current appliances fail, then replace with A+++ appliances.

People and policies:

- Complete the Energy Footprint Tool each year, as part of your Attestation of Records, and submit results.
- Create an Energy Champion who monitors bills and encourages people to turn things off when not needed.
- Write an energy efficiency procurement policy; commit to renewable electricity and A+++ rated appliances.
- Consider moving Kirk Session meetings elsewhere during cold months, rather than running the church heating. Avoid heating different halls or rooms on the same day. Try to combine usage into a single area.

Offset the rest:

For most low usage "Sunday" churches, once they have taken steps like these, their remaining non-renewable energy use will be very small. For the majority, all they need to do now to be "net zero" is offset the small remaining amount of energy through **Climate Stewards** or other reputable schemes.

- Think about your church grounds. Is there an area where you could let vegetation or a tree grow?

B. Where do we go next?

These are actions with a reasonably fast payback for an ecclesiastical property with medium energy usage, used a few times a week. Perhaps around 50% of congregations should consider these actions. Most actions cost more than the ones above, and/or require more time and thought. Some require some specialist advice and/or installers. They are often good next steps for those churches with the time and resources to move on further towards 'net zero'.

The building itself:

- If you have an uninsulated, easy-to-access roof void, consult with your PBO about insulating the void*.
- If you have problematic draughts from your door, and a door curtain wouldn't work, consult with your PBO about installing a glazed door within your porch, or even a draught-lobby*.
- Consider creating one or more smaller (separately heatable) spaces for smaller events.
- Consider fabric wall hangings or panels, with an air gap behind, as a barrier between people and cold walls.

Heating and lighting:

- Learn how your building heats/cooling and the link to comfort, by using data loggers (with good guidance).
- Improve your heating zones and controls, so you only warm the areas you are using.
- Install thermostatic radiator valves (TRVs) on radiators in meeting rooms and offices, to allow you to control them individually. These can be smart TRVs such as Nest or Hive.
- Consider under-pew electric heaters where applicable and/or infrared radiant panel heaters*, which keep people warm without trying to heat the whole space. Radiant panels are good for specific spaces like chapels and transepts, which you might want warm when you don't need the whole church to be warm.
- If you have radiators, install a magnetic sediment "sludge" filter to extend the life of the system.
- Consider thermal and/or motion sensors to automatically light the church when visitors come in, for security lights, and for kitchens and WCs.
- Get your energy supplier to install a smart meter, to better measure the energy you use.

People and policies:

- Vary service times with the seasons, so in winter you meet early afternoon when the building is warmer.

C. Getting to zero

These are bigger, more complex, projects, which only busy churches with high energy use are likely to consider. They could reduce energy use significantly, but require substantial work (which itself has a carbon cost) and have a longer payback. They all require professional advice, including input from your PBO / GTs.

The building itself:

- Draught-proof windows*.
- If you have an open tower void, insulate or draught-proof the tower ceiling*.
- Double-glaze or secondary-glaze suitable windows in well-used areas such as offices, vestries and halls*.
- Internally insulate walls in well-used areas such as offices, vestries and halls*.
- If you have pew platforms, consider insulating under the wooden platform with breathable materials*.
- Reinstate ceilings, and insulate above*.

Heating and lighting:

- Install a new LED lighting system, including all harder-to-reach lights, new fittings and controls.
- Install solar PV, if you have an appropriate roof and use sufficient daytime electricity in the summer.

D. “Only if....”

These are actions you would do at specific times (such as when reordering is happening) or in very specific circumstances. Nearly all require professional advice, including input from your PBO / GTs.

The building itself:

- If you are reroofing anyway, then insulate the roof, if appropriate for your roof*.
- If you have an uninsulated wall with a cavity (typically built 1940 onwards), then insulate the cavity.
- If the building is regularly used and suitable, such as a church hall, consider appropriate external insulation or render, appropriate for the age and nature of the building*.

Heating and lighting:

- If yours is a well-used church which you want to keep warm throughout the week, then consider an air or ground source heat pump. Ground source heat pumps are more expensive and invasive to install than air source heat pumps, but run more efficiently once installed, depending on ground conditions.
- Infrared heaters may present a better option in buildings which are not used as regularly.
- If you are doing a major reordering or lifting the floor anyway, and yours is a very regularly used church, then consider under-floor heating. This can work well in combination with a heat pump (above). The Better Heating Scheme is available through the GTs.

E. By exception

- These actions are often mentioned in this context, but are generally not recommended, because of the risk of harm to the fabric, energy used, and/or the cost.
- Standard secondary glazing on the main, historic windows (this can be inefficient, expensive, and cause damage).
- Install solar thermal panels to generate hot water (hot water use is generally not high enough to justify it).
- Background space heating at all times unless needed for stabilisation of historic interiors (high energy use).

* If interiors are of historic, architectural or artistic interest, seek professional and GT advice first.

This link provides some case studies of retrofit interventions in a Scottish context; [**HES Case Studies**](#)

The [**HES Short Guides**](#) are a useful reference - guides 1, 8, 9, 11 and the guide to retrofit of traditional buildings are relevant.