

Church of Scotland energy issues

Improving the energy performance of a church is an attractive proposition in terms of keeping a congregation physically comfortable and willing to use its facilities, prudent management of running costs and also ecologically responsible in the use of energy resources. However, many traditional church buildings present practical challenges that can be virtually insurmountable, and the introduction of energy controlling materials and features can be damaging to the fabric and aesthetically compromising. The capital costs of adaptation or installations can be high and the value may take many years to recoup. Careful evaluation of options should be considered holistically. The best environment for both people and the building's fabric is achieved where temperatures are maintained with limited fluctuation and this can also be the most efficient use of energy.

New heating systems

New or changed systems may include upgrade or new energy supply, and the most effective systems require good zoning and control with thermostats and time clocks. To install new radiators or underfloor systems can be destructive during installation with adaptation of floors and pews and change to the appearance of the interior.

Ventilation

Management of ventilation and draughts is essential for the health of users and the fabric of the building. Reducing ventilation behind wall / floor / ceiling linings can cause condensation resulting in catastrophic problems with timber decay and rot. Understanding the airflow in and around the building will help manage healthy ventilation and comfort levels.

Insulation

Introduction of insulation products can greatly reduce heat loss, improve the warming up of spaces and reduce energy consumption. Complete wall and ceiling lining can be achieved with insulated plasterboards; however, the installation has to be carefully managed to ensure condensation does not occur and it can change a building's aesthetics dramatically with the loss or hiding of original architectural detail and features, which many people may find unacceptable.

Lighting

Low energy light fittings can greatly reduce energy costs and with longlife bulbs can be of great benefit for health and safety of access for maintenance. Good quality lighting can now be achieved with LED bulbs, which can be used with existing light fittings. A new lighting scheme may be the most aesthetically pleasing solution to improving light quality and energy performance, but the cost of fittings and installation can be expensive and may take many years to pay for itself.

Windows

Traditional leaded and stained glass windows are often very large and cause heat loss from the church. However, they cannot be double glazed effectively and secondary or protective glazing can cause considerable harm to old lead and glass. Replacement of leaded glass windows with sealed unit double glazed windows is likely to be aesthetically unacceptable, but may be suitable in situations with casement or sash windows.

Alternative Technologies

The use of alternative technology, such as photovoltaic panels, can be attractive with the promise of free electricity and the benefit of earning an income from the Feed In Tariff scheme. It is important to assess how efficient this will be in relation to the orientation of the building and whether the visual impact of "clip on" technology is acceptable, particularly for a listed building or in a sensitive heritage location. Maintenance of high church roofs and panels can be expensive as these may be difficult to access. Capital costs of installation may not pay for themselves in their lifetime. Other technologies such as biomass boilers and ground or air source heat pumps require space for installation, are expensive even with grant assistance and output performance is often unpredictable.

Management strategies

For many churches, the most cost effective method of reducing energy use and controlling a building's environment may require no physical alteration of the church fabric but an improvement in the management of the existing energy systems, switching provider, pattern of use and servicing and maintenance to improve efficiency.