

The suitability of various energy sources for churches

Unless a church is a historic one with frequent visitors throughout the year, or where there are services every day, heating during the week is not needed for comfort. However, if there are any furnishings which must be protected from frost, rot or condensation, it may be preferred to have low heat through the winter. Control of when the main heating is on and in what areas is of vital importance for economy.

Photovoltaic panels, when the sun is shining, convert sunlight into electricity. It is at relatively low voltage but can be stored in a battery to give light or power when it is dull. Alternatively, an "inverter" can be used to give alternating current to run mains appliances or even to feed electricity back into the supply. But this form of heating is very expensive and is really only economic when there is plenty of sun but nothing else is available, such as at a mission hospital or just as a demonstration.

Solar thermal panels look quite similar but they actually use radiant *heat*, not light, and a tank of warm water in the summer is not what a church needs, unless perhaps it is integrated with a school, say.

In principle, since a deep mine is hot with heat from the centre of the earth, that energy can be used for buildings too. Unfortunately there are only a few places where this is economic. However, the ground only a little way below the surface will have been heated by the sun during the summer and will stay at least warm throughout the winter. To be usable, the heat must be raised in temperature and this can be done by means of what is called a heat pump. These are familiar in refrigerators, which take heat from their contents and transfer it to an external coil. Thus a **Ground Source Heat Pump** takes heat from piping buried in the earth and delivers it at a usable temperature. It uses electricity for the pump, but not so much as heating elements would need. It can be done with air as the heat source, too. This heat can be provided during the winter, when a church needs it.

Much the most common form of alternative energy at the present time is a **wind turbine**. It would be good to think that the Christian church was so environmentally-conscious that we were starting to fit turbines to spires! Actually, the stonework of a spire might not stand the vibration. Sadly, a free-standing tower seems not even to be thought suitable for a churchyard. A **Water turbine** should be acceptable, but there are not many suitable streams left. However, if a village community is starting to consider any turbine project, the church should most certainly support it, if not being the initiator.

Turning to actual fuel, **wood** (pieces or chippings) are cheap and sustainable, but not labour-free; wood can be obtained in pellets, which need less effort but are expensive. Gas, oil and electricity can all be easily controlled and present prices usually increase in that order. where gas is not available, oil may be cheapest as a fuel at the moment, but this may not always be so. Incidentally, any appliance in which fuel is actually burnt must certainly have a flue, as the moisture would do a lot of damage. Again, if the surrounding village is considering district heating, the church(es) should certainly be involved. If however, electricity has to be used in a church it does lend itself well to accurate control perhaps zone-by-zone.