

GUIDELINES ON REDUCING THE CARBON FOOTPRINT OF YOUR CHURCH

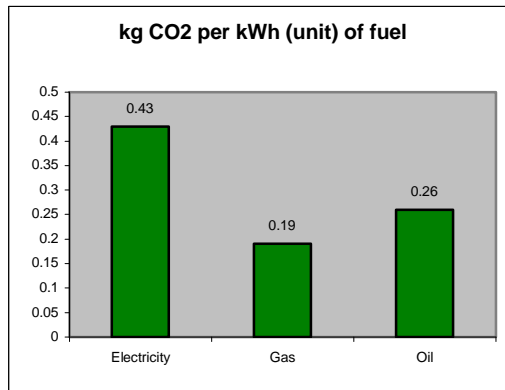
This briefing note is intended to provide some initial guidance for churches wishing to install renewable energy systems or take other measures to reduce their carbon footprint. The idea is to help you identify the right starting points for projects and reduce the time it takes to research different options.

This side of the sheet puts renewable energy options in context and the reverse provides more technical guidance and also has contact details for organisations that can provide further help.

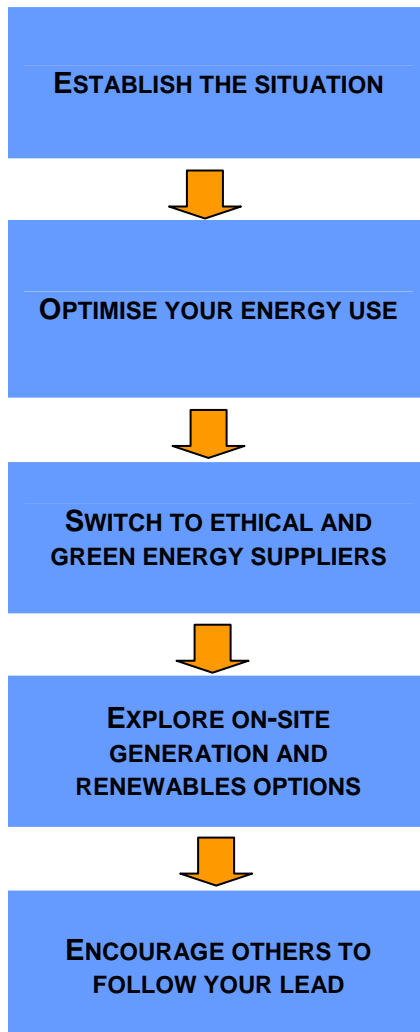
What difference can churches make?

Churches can potentially make a huge contribution to tackling climate change.

They have a position of symbolic leadership in many communities; the largest churches have carbon emissions tens of times those of a typical family home; and every church has a congregation who can be encouraged to reduce their personal carbon footprints through church leadership.



Where should you start?



Once you know your starting point – how many tonnes of carbon dioxide does your church emit each year at the moment – you have a way to track progress and to prioritise different technical options. You can calculate the carbon footprint of your church from last year's fuel bills. The graphic above shows how much carbon dioxide is emitted for each unit (kWh) of energy you use for different fuel types.

Switching lights off when not in use and making sure you heat only areas that need heating costs nothing. It can usually reduce carbon emissions and fuel bills by 10-25% very quickly. By reducing energy use you also reduce the size and cost of any renewable energy system you decide to install, so you gain twice.

Lighting can be a heavy energy user in churches. Energy efficient lightbulbs usually pay for themselves quickly.

There are several power companies in the UK that only supply electricity from green sources, and are much more open about how they generate power and the environmental impact this has. Buying from them supports the development of a more ethical and low carbon economy. Three to look at are Green Energy; Good Energy and Ecotricity.

The extent to which you can use on-site renewables to reduce your carbon footprint will depend on the characteristics of your site, whether you can match supply to demand, and how much funding you can attract. If you can develop a good quality renewables project you will be making a high-profile impact on the environment that should last several generations.

Many churches and congregations want to engage with climate change and make a difference, but relatively few have succeeded as yet. If you manage to implement a successful project you should share your experiences across the community, and can use the project to bring more people into your church.

ON-SITE RENEWABLE ENERGY FOR CHURCHES






There are many different kinds of renewable energy system. Costs and benefits are highly variable and depend very much on specific site circumstances. For example, if you currently have no gas or electricity supply, renewables projects may be much more attractive than the paybacks indicated below suggest.

This briefing provides you with general guidance so you can orient yourself in the field and take the first steps to scoping out a viable project. Like any engineering project, you will almost certainly need expert advice at some stage, and this is usually worth taking once you are clear what it is you want to achieve.

How to think through a project

The steps below assume you have already taken all possible measures to improve energy efficiency (see over).

What renewable resource have we got?		What energy demand do we plan to meet?
Water	If you have a river or stream that drops more than 1.5m on your land, water power is the most attractive of all renewables.	<p>It helps to split your energy use into manageable chunks.</p> <p>Lighting and appliances – always electricity and often predictable</p> <p>Heating – often fossil fuels, seasonal, with large peaks</p> <p>Hot water – usually quite a small demand</p> <p>Try to establish total annual energy demand in each of these categories. For renewables projects you normally start by matching total annual energy demand to total predicted annual energy supply – this sets the size of the system. You should plan to use backup systems or grid supply to manage peaks and troughs in on-site supply.</p>
Wind	Wind resource is dramatically reduced near to buildings or trees. If you have an exposed site you can usually size a wind system to meet your needs.	
Solar	Unshaded roofs in the UK receive around 700-1000 kWh of solar energy per square metre a year, depending how far north they are and the direction they face.	

Which technologies should we choose?			
	Hydropower Generating electricity from water is very economic, has minimal environmental impact, and installed systems can last for 100 years. The challenge is that every site is different – each project is a bespoke engineering design.	Typical project Cost £40 000 + Payback 5-12 years	
			Wind power Wind systems come in all sizes. Building mounted turbines can be cheap but are much less efficient than pole or mast mounted systems and you shouldn't buy one of these without taking independent advice – benefits can be oversold by a factor of 10 or more.
	Solar hot water Solar hot water (or thermal) systems heat water by routing it through pipes or plates on your roof. They are efficient and simple, and can easily be integrated into an existing system by replacing the hot water tank with a new one with two coils.		
			Solar electricity Solar electrical (PV, or photovoltaic) systems generate electricity from sunlight with an efficiency of 8-12%. Solar systems work when it is cloudy, but don't like solid shadow (for example from spires or chimneys). Solar PV is less economic than wind for most sites, but also less obtrusive.
	Ground source heat Solar energy is stored in the ground as heat. This is extracted by the heat pump and brought into the building. The electrical energy used for pumping the heat is less than the heat energy extracted, which makes heat pumps an efficient heating option where fuel is expensive. They work best with underfloor heating systems.		
		Other options include using wood or biomass for heating, which is considered lower carbon than fossil fuels because the wood can be replaced relatively quickly. In the right situations you can also consider combined heat and power , where you use your heating system also to generate electricity. This only works where you have a relatively constant heat demand (such as a pool or residential home) but can provide opportunity to link a church into neighbouring buildings and the community.	

Where to go for more information and impartial advice

Encraft Ltd	Independent professional advice (fee basis). Encraft are a firm of consulting engineers specialising in low carbon technologies and small projects.	0845 6 022 874 www.encraft.co.uk
Carbon Trust	Free government advice for organisations with annual energy bills more than £50 000.	0800 085 2005 www.carbontrust.co.uk
E S T	Free generic government advice from the community action for energy programme.	08701 261 444 www.est.org.uk