

# Heating and the Environment

## - a practical initiative

There are many reports on the television and in the papers about how we must stop the changes to the world's climate caused by burning fossil fuels before they get completely out of hand.

But it is quite unusual to hear about a local group of ordinary people spending their own money to do something about it by installing heating using renewable energy resources.

St Mary's Church of England congregation in Welwyn, Hertfordshire is one such group determined to take action now. They are convinced that caring for the environment is part of the responsibility that their faith demands and also that seeking to help the poorest people in the world not only requires action on debt relief but also on climate change.

In a debate in the House of Lords in June 2005 the Bishop of Liverpool put it very clearly:

*"The Prime Minister rightly wants to place at the top of the G8 agenda both Africa and climate change. Dealing with poverty in Africa calls for debt cancellation, good governance and fair trade - but it also calls for action on climate change, which will increase Africa's poverty through droughts and floods. That is already happening. What is the point of G8 taking steps to reduce poverty with one hand but, by refusing action on climate change, to increase poverty with the other hand? Both problems need to be tackled. "*



At the same time St Mary's is raising money to add a much needed building attached to the existing church.

St Mary's has been at the centre of the village for centuries serving the people of Welwyn, expanding and changing to meet new needs down the years.

The new building attached to the back of the church is now needed to continue that service.

This bold project will provide attractive, safe and accessible rooms for the activities of all ages to strengthen the life of the church in worship and fellowship and serve the wider community.

The combination of both projects puts considerable strain on local fund raising but, for practical reasons, the new heating system has to happen at the same time as the building work or not at all.

## Fossil Fuels and Greenhouse Gases



When fossil fuels are burnt - coal, gas or oil - the carbon captured hundreds of million years ago by growing plants is released back into the atmosphere in the form of carbon dioxide. Carbon dioxide is a 'greenhouse gas' - which means it lets through the sun's heat but blocks heat leaving the earth towards space. The result is the earth heats up and that causes climate change and, probably, more extreme weather conditions. Fuels like wood, straw or anything which has grown recently, do not release 'fossil' carbon.



## St Mary's Plan

St Mary's now uses a gas boiler to heat the church and it is big enough to heat the new building too - but that would emit 44 tonnes of carbon dioxide annually into the atmosphere. The hope is to avoid this by using the gas boiler only as back up to ground source heat pumps. Extensive calculations have shown that, although the plan will be expensive, it will save money in the very long term as fossil fuel prices rise. But it is certainly not 'an investment' in the financial sense - it would be better to put the money in the Building Society than spend it this way - that is if you don't care about the environment.

## Ground Source Heat Pumps

Electricity is 'high-grade' energy which can be used to run motors and do work. Just burning it in an electric fire wastes its full potential - although it can be very convenient. Using electricity to pump heat out of the ground and into buildings is 3 to 4 times more efficient than burning it - but it costs a lot of money to drill the 'thermal boreholes' to get the heat out of the ground. St Mary's will need about 18 boreholes going down about 30m under Welwyn churchyard. The heat pumps will go in the existing boiler house, but they are not cheap either. Once installed, there will be nothing to see above ground, no fumes, no smell, no noise and no carbon dioxide. However, we are aware that most electricity is generated using fossil fuel energy and although we will be using it very efficiently we will also try to buy it from exclusively 'green' sources like wind turbines. That way we could get our total fossil carbon dioxide output down to an absolute minimum.

## Why use any gas at all?

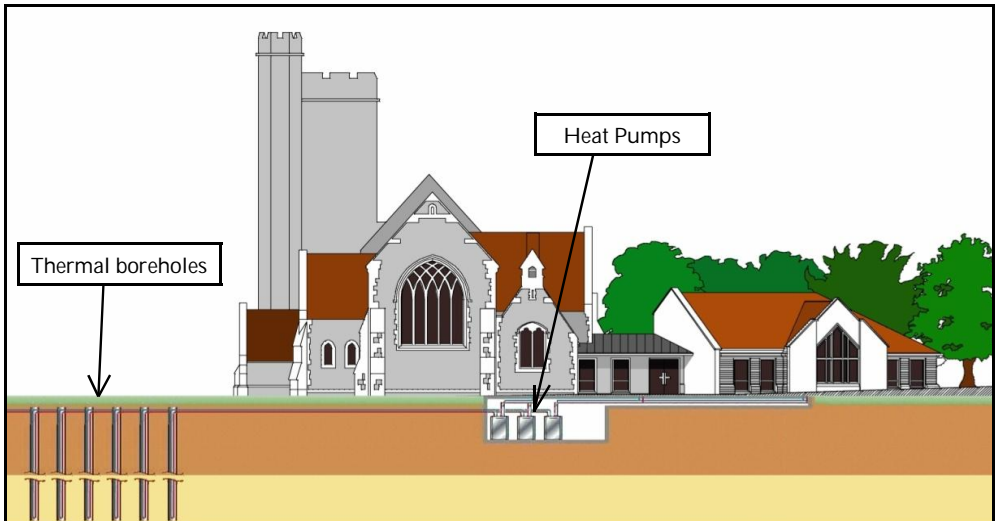
At St. Mary's we plan to heat both our new building and our historic church from a Ground Source Heat Pump (GSHP) system in order to reduce carbon emissions. However, we also plan to use a gas boiler as well in the coldest weather.

Expert opinion, and our own measurements over two winters, show that getting all the heat from ground source heat pumps could save the last few percent of carbon emissions, but would also increase the system size and lead to its inefficient use. In any case it is doubtful if we could find space in the churchyard for more than the planned number of boreholes.

Installing a GSHP system to give around 80% of the maximum heating load of our buildings will provide more than 90% of our actual heating need. In the past winter we should have needed to use the gas boiler for only 10 days, in the previous year, for none at all. It all depends on the vagaries of the winter weather and as the climate is warming we shall use less gas each year - in a perverse way a 'benefit' of global warming!

## Why what St Mary's is seeking to do is important

First we will reduce our carbon dioxide emissions considerably - see the next page. But, just as important, we will demonstrate that it is possible to heat an old, listed building with renewable energy. Everybody will be able to see what we're doing - we're going to provide environmental displays and we're involving everyone we can, especially young people, in the planning.



## The Bottom Line

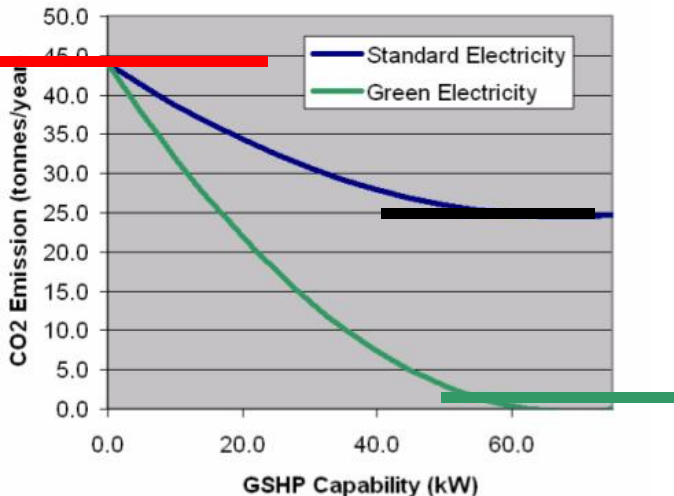
We'll really have two 'bottom lines'.

First the money. St Mary's needs to raise a great deal of money for the new building and is well on the way to achieving the target through local support. For the environmental heating we will need an extra £40,000. To do this we are seeking support from trusts and charities working in the environmental field to supplement local efforts; and that is the reason for this brochure. Any money raised for the new heating system will be kept separate from the main building fund.

Second the environment. This is best illustrated with a graph showing our annual carbon dioxide (CO<sub>2</sub>) emissions with and without the extra £40,000.

- Without GSHP: the **Red Line: 44 tonnes of CO<sub>2</sub>** a year
- With GSHP and 'ordinary' electricity: the **Black Line: 25 t of CO<sub>2</sub>** a year
- With GSHP and 'green' electricity: the **Green Line: 1½ t of CO<sub>2</sub>** a year.

**Carbon Dioxide Emission v GSHP Capability**



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