



Carbon Reduction Plan – Stage 1 “Preliminary Carbon Reduction Options” Summary Statement, March 2011

Prepared by Z. Wallage
The Low Carbon Innovation Centre
University of East Anglia
Norwich
NR4 7TJ

Background:

The combustion of fossil fuels (coal, gas and oil), for power generation, heating and transportation releases greenhouse gases, such as carbon dioxide (CO₂), into the Earth's atmosphere. Fossil fuels are finite resources and as reserves decline, prices increase and become more volatile in nature. In recent years there has been an increasing demand by communities to ascertain the benefits of using energy efficiency measures to reduce CO₂ emissions, supplemented by the installation of renewable energy technologies. The Suffolk parish of Wenhaston with Mellis is one such community; and in their quest for enhanced sustainability the “Wenhaston Energy Support Group” (WESG) commissioned the Low Carbon Innovation Centre (LCIC) to undertake a study to appraise a range of carbon reduction options for the village.

Baseline:

Earlier surveys revealed an annual baseline emission of 4,200 tonnes CO₂ for the community in 2009, which equates to approximately 11 tonnes per household. This figure is useful as it can be used as a benchmark against which the success of future actions taken to reduce emissions can be gauged.

Carbon Reduction Plan – Options Appraisal:

A summary of the review is provided below, the key outcomes of which follow a hierarchical structure:

1) Demand Reduction:

Although fuel prices are rising, many households still unwittingly waste substantial amounts of energy and thus needlessly emit CO₂. First and foremost therefore, it is essential that the issue of demand reduction is addressed (e.g. via draught proofing, insulation and smart metering) before any new technologies are considered. Data suggest there is also potential to reduce emissions through behavioural change, such as switching off unused appliances and unnecessary lighting. The report identified that if all households successfully implemented just one action to reduce demand, annual CO₂ emissions could be reduced by as much as 15%; and if all demand reduction actions were implemented emission reductions could be in the region of 25%. Thus, although it is generally seen as a rudimentary low-tech measure, demand reduction is still one of the most effective and, in most cases, cheapest options.

2) Energy Efficiency:

The next step in a carbon reduction plan is to install new energy efficient technologies and appliances to optimise the remaining energy demand, powered from conventional sources. Heating energy can, for example, be optimised by installing a new energy efficient condensing boiler, or double or even triple glazing, whilst electricity can be optimised through the use of new low-energy lighting, automated controls and by a commitment to upgrade equipment with energy efficient A++ rated appliances. The study identified that the use of energy efficiency measures in domestic properties could contribute an additional 15% reduction to emissions. Thus, it may be possible for residents to achieve a 40% reduction in CO₂ emissions through a combination of demand reduction and energy efficiency alone.

3) Renewable Energy:

The final step would be to de-carbonise the energy supply by installing renewable energy technologies. Householders can often be intimidated by the uncertainty regarding the suitability and reliability of individual technologies. Therefore, this report provides a comprehensive overview of options and includes data relating to likely costs and carbon benefits, as well as more technical issues relating to planning and the environment. The review outlines that ground/air source heat pumps and biomass boilers are likely to be the most attractive heat-based options in a rural “off-grid” community, whilst solar panels are likely to be the most reliable and readily available technologies for electricity generation. Obviously, these options require greater financial investment from residents. However, if households use MCS certified installers they are eligible for financial support from two government schemes promoting the installation of domestic-scale renewables – namely the “Feed in Tariff” and the “Renewable Heat Incentive”. These would provide investors with a minimum 8% annual rate of return.