Designing a Zero Carbon House

This challenge involves thinking about the energy used in a typical 3 bedroom house by a family of 4. It involves (1) investigating ways of reducing the energy required; and then (2) producing that energy in ways that are **Carbon Neutral,** thereby eliminating the need for conventional heating sources.

If this is to be done in a 1hr time slot it would be best to work as 3 groups so that:

Group 1: investigates the typical energy requirements

Group 2: investigates ways of reducing energy requirements

Group 3: investigates **Carbon Neutral** ways of generating energy

The following notes and examples are intended as a guide to how the challenge could be organised. They are in no way prescriptive and can easily be adapted to suite your own resources and time commitments.

Group 1 Typical Energy requirements

The group needs to first find out what electrical appliances are essential for the house, and then, using the power rating of the appliance, calculate the energy needed to run it for a week based on an estimate of the hourly use per week of each appliance. Remember that the initial premise is that conventional heating systems will be eliminated from the house, so these do not need to be included in the calculations.

Sheet A shows an **example spreadsheet** of how these calculations could be done.

Group 2 Reducing Energy requirements

The group needs to investigate a range of energy saving ideas, and for each one, consider the advantages and disadvantages of adopting them. Some of the group could consider ideas based on improved insulation whist others look at ideas based on reducing usage.

Sheets B & C show a simple ideas selection sheet and examples based on **insulation** and **reduction of energy use**.

Group 3 Generating Energy using Carbon Neutral resources

The group needs to consider how the energy for the **electrical appliances** and **heating water** could be generated using Carbon Neutral sources. Again they should consider the advantages and disadvantages of each system.

Sheets D & E show how the ideas selection sheets could again be used

Sheet F could be used by the Group 3 as an extension exercise to work out the cost and efficiency of their chosen system once they had the yearly energy requirement figure from Group 1.