Eco-new build fact sheet

If you are building a new home you have the opportunity to build a house that impacts as little on the environment as possible, both in terms of the energy it uses and construction materials. The Ecology Building Society encourages you to minimise the environmental impact of any building work you undertake, from an extension to a complete house. This fact sheet sets out the main ways to do this.

Design issues

Aim to build a well insulated, air tight building and design to make the best possible use of daylight and sunlight, whilst ensuring that the building will not overheat in summer. Remember that the Building Regulations are a legal minimum and do not represent best practice, so aim to exceed their parameters. Follow the Good Practice Guides to energy saving available from the Energy Savings Trust on www.est.org.uk/bestpractice or 0845 120 7799. The choice of design will depend mainly on your budget and local planning requirements. If you employ an architect ensure they have experience in designing environmentally sustainable dwellings.

- Site the building to make as much use of solar gain as possible
- Light weight construction responds quickly to heating but can overheat in summer if poorly designed
- Use the thermal mass of a heavyweight construction to store passive solar energy
- A timber, straw bale, earth or cob building can use natural, locally sourced materials
- Underground housing can be less obtrusive in sensitive areas
- Ensure there are plenty of openable windows for fresh air
- Pressure test your building once the external envelope is completed

Reduce energy and CO_2 emissions in use

Unless you are completely self sufficient from the grid and have an on-site renewable energy system sufficient for all your needs, you will be producing CO_2 when heating or lighting your home and using appliances. You can reduce the energy consumption of your home by building a highly insulated and airtight dwelling with controlled ventilation. Use energy efficient lights and appliances. CO_2 emissions can be reduced further by careful choice of heating system. Use a condensing gas, oil or LPG boiler or an efficient wood pellet boiler. Never be tempted to heat your home by electricity as this has a very high environmental impact because of the increased carbon load of the electricity produced in the UK. Over twice as much CO_2 is produced per kWh of electricity as opposed to a kWh of heat from a gas condensing boiler.

- Insulate the building envelope as much as possible
- Use passive stack ventilation or mechanical ventilation with heat recovery
- Fit timber framed double or triple glazed windows with low E glass to as high a specification as possible

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A condition of any mortgage offer we make will be that you do not install any uPVC window frames or doors.

- If using gas oil or LPG install a condensing boiler. The SEDBUK rating of all boilers can be found on www.boilers.org.uk
- If considering wood for heating an efficient pellet fed boiler is the most energy efficient choice
- It is important that your heating system and hot water system is controlled well and can take advantage of milder weather conditions or localised solar gain. Ensure that controls meet CHeSS best practice standard
- Install a radiant heating system (usually under-floor heating); due to the low flow and return temperatures of this type of heating system, a condensing boiler will always be working in condensing mode, thus optimising its efficiency
- Locate the boiler, hot water store and hot water outlets near to each other
- Ensure the primary pipe work between the boiler and hot water cylinder is insulated throughout its entire length
- Install low energy light bulbs
- Buy A-rated appliances e.g. washing machines, fridge freezers etc
- Sign up to a green electricity supplier to stimulate the growth of renewables in the UK electricity generating industry. However, do not be tempted to think that this means you can install electric space and water heating. 3% of the UK's electricity comes from renewables. 20% of the UK's electricity is needed for lights and appliances
- Install a solar water heating system, or ensure that the building is "solar ready", i.e. a south facing roof with no dormer windows, and a cylinder cupboard big enough to house the solar cylinder and all necessary controls
- Consider installing photovoltaics and/or a wind turbine
- Grants are available via the Low Carbon Buildings programme for the installation of some zero or low carbon energy systems

Conserve water and reduce storm water run off

Demand for water in the UK is rising steadily. Over 60% of treated water supplies are used in dwellings and the average person in the UK uses 140 litres of water a day. Although we have less hosepipe bans than we used to this rising demand is a problem, especially during times of low rainfall. Building new reservoirs and treatment plants is not a sustainable option. At the same time flooding in the UK is increasing, as a result of building on flood plains and also because of the increased rainfall intensity. A sustainable water strategy addresses both these issues.

- Fit low flush dual flush WCs
- Fit aerated heads on basin taps and shower heads
- Install a shower fed from the boiler. Do not install a power shower

- Collect as much rainwater as possible during the autumn and winter for the garden whilst designing a garden that requires minimum water; use drought resistant species and plenty of organic mulches. This reduces your water demand and also reduces the strain on surface water drains during storms
- Run surplus rainwater to soak ways if ground conditions permit. This recharges the groundwater and prevents localised flooding
- Consider using rainwater in the building to flush WCs and for washing machines only if the supply of rainwater is greater than the demand for garden watering
- If the Environment Agency specifies a packaged sewage treatment plant instead of a septic tank and leachfield, consider a reed bed to treat the sewage. A reed bed provides a habitat for certain types of wildlife. However, if the ground conditions are suitable for a leachfield this is the best environmental option
- Reusing greywater on the garden for sub surface irrigation can reduce the strain on the sewage system used and is useful in rural situations. Greywater for WC flushing is a poor environmental choice as chemicals have to be added to the water before re-use

Reduce pollution and resource depletion in the external environment

Every material you use will have had some sort of environmental impact during its manufacture, some more than others. Use local, renewable or natural materials and resources wherever possible. When looking at a particular material choice always ask "Does its unique positive function over-ride its environmental impact?"

- Choose only zero ozone depleting materials (Zero ODP)
- Minimise the use of chemicals or products that use a lot of chemicals in production
- Choose materials that are natural and from a renewable resource
- Use materials that have a low embodied energy and are not polluting in their manufacture, use or disposal
- Use second hand materials where possible
- Use locally grown or Forestry Stewardship Council (FSC) accredited timber for all timber work
- Use durable timber species externally to reduce the amount of preservatives that are needed, e.g. English oak, sweet chestnut and European larch
- Use materials or products that are reclaimed or recycled
- Choose durable products that have a long life span and are low maintenance
- Avoid PVC where possible
- Source materials from manufacturers with a proven environmental management record who can readily supply environmental and health data

Reduce pollution in the internal environment

It is now quite common to find that the internal environment in many buildings is more polluted than the external environment. Many different chemicals are found in our homes and the effect on our health of these cocktails of chemicals is unclear. Allergies such as asthma are on the increase, as are cases of multiple chemical sensitivity. Some materials, for example, many paints and carpets, give off gas synthetic chemicals once in the house.

- Use hard flooring and avoid carpets/coverings that will harbour dust mites and chemicals
- Use linoleum instead of vinyl flooring
- Use low emission paints and finishes
- It is not necessary to treat internal timbers if basic good design principles are followed
- Consider reducing the effect of electromagnetic fields when designing the electrical system

Biodiversity

As more land is built on wildlife is displaced. A garden can be a haven for wildlife.

- Retain existing trees and hedgerows wherever you can, ensuring these are protected adequately during the building works
- Create wild areas using native trees, shrubs and wildflowers
- Encourage wildlife by installing bird/bat boxes
- Build dry stone walls
- Put in a pond
- Consider using turf roofs and roof gardens in urban areas

This fact sheet was written by the **Association for Environment Conscious Building (AECB).**

Established in 1989 the AECB is a non profit making organisation that exists to encourage greater environmental awareness within the UK construction industry. It promotes the use of products that are safe, healthy and sustainable. Its diverse membership encompasses all aspects of building design and construction as well as individuals with a keen interest in environmental issues. Visit www.aecb.net for details of how to join, other useful websites to back up this fact sheet, and a recommended reading list.

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