

Section 11 Environmentally Sensitive Design

A major element of Low Impact based design is to reduce the negative environmental impacts associated with modern home building. By investing a little additional time and thought in the initial planning stages of development, environmental impacts can be reduced and in the long term personal costs such as heating costs can be reduced.

The Council's Energy Agency provide free advise on issues relating to energy efficient design and site layout.

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It is an objective of the Council to promote and encourage the use of environmentally friendly building methods and materials in all new developments within the County.

Specialist architects should undertake energy efficient design, in particular eco-architecture. The Royal Architectural Institute of Ireland can provide details of same.

11.1 Insulation & Saving Energy

- Insulating your home is perhaps the most important, inexpensive and fairly simple means of lowering environmental impact associated with your home.
- Homes can be heated with small amounts of fuel providing the heat produced does not escape once released into the building.
- Good insulation ensures a comfortable and cost effective living environment.
- Environmental costs are reduced through the reduction of emissions and the retention of heat which otherwise escapes to the atmosphere.
- All wall cavities, floors and attic spaces should be fully insulated and air tight to reduce heat loss.
- Doors and windows should be highly insulated and draught sealed. Glass should have as low a U rating as possible.
- Draughts from other areas should be sealed such as letterboxes, between floorboards, around skirting boards, around attic hatches, where floor joists meet external walls and where pipework penetrates external walls.
- All hot water boilers, storage units and pipes should be lagged or insulated; the water will stay hotter for longer saving you energy and money.
- The top and sides of the cold-water storage tank should be insulated, however the area directly underneath the tank should be left uninsulated to allow heat from the house to warm it.
- Insulation comes in many different forms and can be installed in a variety of different ways such as flat board, pumped bead and fibre, fibre rolls, sheep's wool, hemp. The choices available are extensive and information is now widely available to ensure the right choice for your home.
- Timber frame houses are built using wood, a renewable resource, the wooden frame and skin retains heat and they can be erected more quickly than conventional block homes.
- In the most frequently used rooms install CFL light bulbs these use only 1/5 of the energy that an ordinary bulb uses and last up to ten times longer.
- Always fit radiators with thermostatic valves allowing you to set the temperature to comfortable levels and at the same time reduce energy consumption. Fitting reflective foils to the back of radiators will reflect more heat into the room.
- Remember to switch lights and plugs off and pull plugs out of the wall at night, this can result in up to 25% savings on annual electricity bills!

11.2 Heating & Energy Production

- Consider carefully home heating options. An open fire and many gas fires have an efficiency of only about 15 - 30%, meaning that up to 85% of the energy content of the fuel escapes through the chimney.
- By comparison, an efficient central heating system can be up to 90% efficient.

11.3 Solar Energy

- The use of free solar energy is being harnessed more frequently as an energy source for the home.
- Using solar energy reduces the need to burn emission-releasing fuels and lowers electricity usage; it is safe, clean and environmentally friendly.
- Latent Solar Heating: Orientating a house so that glazed areas of the main rooms in use face South allows latent heating of those rooms throughout the year during daylight hours. Thermal mass within south-facing rooms can absorb and store solar energy during the day and release it gradually during the evening saving up to 30% on annual heating bills.
- Active Solar Heating: Solar panels on a south facing roof can provide approximately 60% of a family's hot water requirement. Larger panels can convert sun energy for electricity usage. They can be fixed to non-south facing roofs however harvest less energy; costs for installation can be recouped fairly quickly.

11.4 Alternative Systems

- Geothermal heat pumps convert heat energy available within the grounds of the site, they can be installed in a variety of forms:
 - Shallow horizontal array – pipes are laid out in a yard or garden below ground, much like an under floor heating layout.
 - Water-based geothermal potential -streams, ponds or lakes, shallow high-yielding aquifers or even a steady source of wastewater can be used as a heat energy source.
 - Bore holes - in sites with little or no free ground space and no hydro-geothermal potential, the approach is to use bored holes to insert heat exchanger loops vertically rather than horizontally.
- Wind turbines can provide electricity to utilise for heat energy and appliances. The siting of such structures must be undertaken with care in order to utilise optimum wind levels and to avoid negatively impacting on visual or neighbouring residential amenity.
- Bio fuels such as willow, wood chip/pellet and simple wood burning stoves can be utilised to provide heat for the home. Wood and bio fuels are renewable and intake more carbon whilst growing than they release whilst burning.
- Mixing wood with coal or other burnables in open fires reduces the amount of carbon generated. Landowners could grow their own fuel supply!
- It is important to have a thorough and comprehensive survey prior to installation of any system in order to establish the economic and environmental feasibility of the system.

11.5 Conservation

- Rainwater Harvesting Systems collect and store rainwater. This can then be used for gardening, laundry, cleaning and flushing toilets, saving up to 50% of the average drinking water supply. With added treatment such systems can be used to provide drinking water supply also.
- Reed beds can be used for improved sewage treatment thereby conserving soil quality and reducing pollution of ground and surface waters. They comprise of an area within a garden (approximately 3m x 4m for an average 6 person household) of tall reeds above a gravel filter bed, and a second area for polishing or tertiary treatment of final discharge. This system requires approximately five hours weeding per year and de-sludging every two years.

11.6 Waste

- Reducing the amount of household waste associated with your dwelling will reduce amounts of waste entering landfill sites and will save you money on bin charges and collection fees.
- By recycling those objects suitable and by composting organic waste the amount of waste for collection can be reduced by up to 85%. Compost Bins are now available at all Council Public Services Centres.