

# The ecohouse, Leicestershire

This house is designed to minimise its impact on the environment and make the most of renewable energy sources. By facing south it benefits from *passive solar design*. Large windows to the south allow sun to heat the house but thick dense walls prevent heat loss. Heavy-weight in its design the house has a high thermal mass so that it should not require any additional heating, thus it is a *zero-heat house*. Overall, the whole house is designed to significantly reduce energy use in its construction and daily living.

## Summary of environmental specifications

<i>Energy generation</i>	Currently limited to solar thermal water heating (see below) and use of main grid wind-turbine powered electricity. In future hope to have photo voltaic on the roof.
<i>Energy use</i>	Reduced by A+ rated electrical appliances, low-energy lighting, and all batteries are solar recharged.
<i>Roof</i>	Ardesia recycled tyre roofing (i.e from old car tyres) on FSC (Forest Stewardship Council) wood rafters resting on a steel beam, with 250mm of sheeps wool insulation
<i>Floors</i>	A 100 mm concrete slab over 100 mm polystyrene insulation, then reclaimed pine floors, tile or carpet made from jute and wool. [First floor acoustic insulation, mineral insulation]
<i>Walls</i>	Enviroblock EV11 (Masterblock, Aggregate Industries, Croft) – dense [1950 kg/m <sup>3</sup> ] 100% recycled aggregate blocks for internal and external walls. 200mm mineral wool insulation. Outside half covered with red cedar weather board
<i>Doors</i>	Internal doors from old pine, external doors to similar spec of windows (see below)
<i>Windows</i>	Double-glazed, softwood frames, low-emissivity glazing to reflect radiant heat back into the building with Argon gas fill and high thermal insulation. BFRC (British Fenestration Rating Council) A rated timber energy window. Also Velux.
<i>Space Heating</i>	Need substantially reduced by significant insulation. Designed to suit site. Large windows to south, few and smaller to north enables passive solar heating, even in winter with low sun elevation. Additional heating (if required) provided through wood fired stove with back boiler feeding five panel radiators and hot-water cylinder. Fuel to be sourced from off-cuts and through log making. Electric powered under floor heating in bathrooms
<i>Hot water</i>	Approx 4m <sup>2</sup> of (Two) Solar thermal evacuated tube arrays (Rayotech) on roof with a back up electric emersion
<i>Water use</i>	Low flow shower. Rainwater harvester collecting run-off from roof to flush low- flush toilets and fill washing machine and outside tap. Toilets IFO Cera from Green Building Store
<i>Cooking</i>	Electric induction cooker reducing energy use
<i>Lighting</i>	Low-energy lighting, compact fluorescent bulbs.
<i>Ventilation</i>	Background ventilation via trickle vents in windows, and direct ventilation is mechanical extraction vents (fans) in the kitchen and bathrooms.
<i>Paints and finishes</i>	Organic non-toxic eco-paints and varnishes used throughout. ECOS internally and Osmo externally.