The Sustainable Lifestyle House shows how you can live comfortably and save energy and money at the same time. The design intent of the Sustainable Lifestyle House relies largely on passive solar heating in winter and passive cooling in summer. Additional features incorporated into the house to save or offset energy use include:

**Solar photovoltaic system**
A 2.75 kW BYD system has been installed on the north facing roof. This system will generate on average approximately 12kWh of electricity per day which would cover around 60% of a normal household consumption. As the house will require less assistance to heat and cool the house, due to the solar hot water system installed, it is expected that the system will cover nearly all the house’s electricity demand.

This solar photovoltaic system is grid-interactive, which means that any excess electricity generated will be fed back into the main grid, with the occupants receiving a credit on their bill.

System: 2.75kW, with 12 x 215 watt panels with 25 year performance warranty.
Inverter: Aurora, 3kW.

**Solar hot water system**
Water heating accounts for 25% of energy used in an average home. Installing a solar hot water system will not only reduce energy bills as the sun is used to heat the water for zero cost, there are also far less greenhouse gas emissions.

An evacuated tube solar hot water is on the north facing roof. This system is designed to cope with up to 5 occupants and heat around 80% of the water needed, with the remainder heated by the back-up electric system.

System: Apricus evacuated tube split system, boosted by electric system
Size: 30 tube, 315 litres

**Master/Holiday switch**
The house has been fitted with a master/holiday switch. This allows all non essential electrical loads such as lamps, computers, televisions and other appliances to be conveniently turned off from one switch, saving energy when residents are not at home.

**Appliances**
When purchasing new appliances, apart from the initial cost, size and features of an appliance, it is very important to consider the running costs. The energy star rating label for appliances provides a comparison of the energy efficiency of domestic appliances. In addition where possible, alternatives to electrical appliances have been used in the house.

For example, the installation of internal and external clothes lines to assist in drying clothes during different conditions.
**ENERGY EFFICIENCIES**

**Insulation**

Much of the heat in a non-insulated house can be lost through the ceiling. The Sustainable Lifestyle House has polyester bulk batts installed in the ceiling cavity as well as having foil installed under the roof. Polyester batts are recyclable and contain no chemicals or pesticides.

The ceiling cavity is insulated by two layers of R2.5 polyester batts (making an R5.0 total value). The flat roof section is roofed with a Kooltherm foam sandwich panel which has a Colorbond top skin, high performance closed cell extruded foam core, and a foil underside. It has R3.0 batts on the ceiling for a total R5.6 value. The cavity brick walls are insulated with R0.8 15 mm Foilboard, whereas the external timber framed walls are insulated with polyester batts to give a total R3.0 value.

**Lighting**

The lights in the house have been selected based upon differing needs in different areas of the house. T5 fluorescent lighting is used in the kitchen whereas Compact Fluorescent Lights (CFLs) are used throughout the remainder of the house.

T5 lights use 40-60% less power than the equivalent T8 fluorescent lights. CFLs use approximately 25% of the power consumed by a traditional incandescent lamp. They also produce less waste heat, keeping your home cooler in summer. Lighting technology is moving forwards very quickly and even in the short period since the house has been completed different LED lights have become available which broaden the choice of low energy lights dramatically.

**Cooling**

Ceiling fans, with a winter/summer switch, have been installed in all bedrooms and livings rooms as an alternative to air conditioning. In winter the fans are used to push warm air upwards so it spreads out and down again very gently, braking up the stratification effect that otherwise holds the warmest air at ceiling level. In summer, the fans spin fast downward, causing a cooling effect which reduces perceived temperatures by up to 9 degrees Celsius. Fans are the cheapest cooling system to run, with the least greenhouse impact, whereas air conditioners are not only the most expensive cooling system to run but also produce more greenhouse gas emissions.

**Heating**

A Coonara Grange freestanding gas fixed flue heater with 5-star energy rating has been installed in the informal living area. The house also has a warm air transfer system to take hot air from immediately above the heater, and deliver it by insulated ducting to floor level in the other living area. This is regardless of whether the door between the rooms is open or closed.

**Suppliers**

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<td>Heating</td>
<td><a href="http://www.thefireplace.com.au">www.thefireplace.com.au</a></td>
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For further information

www.savepower.nsw.gov.au
Insulation Council of Australia & New Zealand
Tel: 1300 363 742 www.icanz.org.au
Energy Star Rating Labelling for Appliances www.energystar.gov.au

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