GETTING ENERGY SMART

In the last 8 years, residential electricity prices have increased at a faster rate than escalating petrol prices, so how can we use less and maximise energy efficiency?

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With petrol now costing over $2 per litre, there is widespread uneasiness over the price of oil. But it's not just oil costs that have been increasing; the price of all types of energy has been going up. Electricity prices were 66% higher at the start of this year than they were 8 years ago (based on prices from the Ministry of Economic Development's website). Even considering that general prices have been increasing, electricity supplied to your home is costing 39% more in real terms.

These price increases have taken the amount spent on residential electricity in 2007 to $3,000 million. But electricity provides only about 69% of residential energy use (the rest includes natural gas, LPG, wood and coal), making the total amount spent on residential energy use higher still.

Opportunities for savings

BRANZ's HEEP project (see *Build* October/November 2006, pages 46–48) has increased our understanding of how energy is used in households. The two big components, or end uses, of residential energy are space heating and water heating. Both these areas offer great opportunities to save energy.

People are less interested in 'energy use' as such; what they want is a warm house and a good supply of hot water. So the best place to start saving energy would be by cutting out wastage in the system, thus minimising the amount of energy required. The next stage would be to ensure that the energy is delivered as effectively as possible, by maximising efficiency.

Insulate to a high level

High levels of insulation and good building design can go a long way towards minimising the need to use energy for space heating. Although house insulation became mandatory in 1978, and the levels required have been revised upwards a number of times since, they only represent the base level. Well-performing buildings should aim higher. There are many examples of new houses that can achieve comfortable indoor conditions through high levels of insulation and good design without needing heaters. One example is Beacon Pathway's Waitakere NOW Home® (see www.nowhome.co.nz).

The best time to deal with these issues is at the design and construction stage, but there are many existing houses with little or no insulation, and because insulation is part of the 'bones' of the house. it's hard to know whether it's sufficient. Retrofitting existing buildings provides challenges and Beacon Pathway also has a programme looking at these issues (see www.beaconpathway.org.nz).

An important step to having high insulation levels is the widespread use and recognition of 'star ratings' for houses. Most of us are familiar with appliance star ratings (the more stars, the more efficient the appliance), and EECA are piloting a similar scheme for houses (see information on HERS at www.eeca.govt.nz).

Efficiency is the key

Most houses do need some form of heating; therefore, efficiency is important. There are various improved technologies such as clean-burning wood pellet heaters or electric heat pumps. Heat pumps have increased in popularity: 19% of houses had them in 2007 compared with only 4% in 2002 (see *Build* February/March 2008, pages 38–39, or BRANZ study report 186). More information is also available on the LEVEL website (www.level.org.nz) or in the recently released *Energy* book in the new BRANZ sustainable building series.

Of the $3,000 million spent on residential electricity, approximately $950 million is for water heating. Reducing the wastage in water heating systems can include ensuring that low-flow showerheads are installed and that hot water cylinders are well insulated.

Even when such measures are implemented, water heating still requires a source of heat. Efficient ways to do this include using solar radiation as part of solar water heating systems or environmental heat (either from the air or the ground) in heat pump water heating systems. Over the last 3 years, BRANZ has undertaken research into how well these systems work in New Zealand (see pages 58-59, this *Build*).

Appliances and lights

There are many opportunities for energy savings within the remaining 37% of residential energy use, much of which is electrical. Many appliances have standby modes that use energy even when the appliance is switched off. When buying new appliances, consider those with low standbys and look out for the energy star label (www.energystar.co.nz) as well as appliances with a high number of stars on their star rating labels (www.energyrating.gov.au).

The price of compact fluorescent lamps has reduced considerably in recent years, so their use is becoming more widespread. There are even moves afoot here to outlaw standard incandescent light bulbs from 2009 (see *Build* June/July 2008, page 75). Refrigerators have improved in efficiency considerably over the years, with new energy-efficient models easily outperforming older ones. EECA has started to trial schemes to encourage people to turn in their old refrigerators.

It is unlikely that energy prices will ease in the future. It will become increasingly important to ensure that our houses are well configured and outfitted to make best use of the energy they are supplied with. Energy efficiency has moved on from being an issue for concerned environmentalists to an issue facing everyone in the community as they deal with increasing energy costs.