

# Watt's

## THE BIG DEAL?

*Making your home energy efficient has surpassed being cool and trendy – it is now essential. By James Retief*

# PROPERTY

**THANKS TO THE TELEPHONE, BAD NEWS CAN BE CONVEYED INSTANTLY. GONE ARE** the days of gaily walking down the garden path to collect the mail, only to open a two-week-old letter announcing the sad demise of Uncle Martin. While the post now seldom carries news of death, it certainly covers disaster ... mostly in the form of our monthly electricity bills.

The substantial 24.8% increase in electricity tariffs announced earlier this year has all of us thinking twice before switching on the lights. And this is just the first of another two approximately 25% annual tariff increases already approved. The average South African suburban household consumes 1 100 kWh of electricity a month. Before the 2010 increase this would have cost R560. The same amount of electricity will now cost R699 a month. Next year this will be up to R879 and the year after that a staggering R1 106.

The writing's on the wall in day-glo green, indelible ink – we need to save electricity and in a meaningful manner. We know about geyser blankets and compact fluorescent lamp (CFL) bulbs and about the Eskom rebates on the cost of installing solar water-heating systems. But what else should we be doing to ensure that we run our homes as energy efficiently as possible?

## THE BASICS

Air quality and climate change specialist, TV presenter and former weatherman Simon Gear, says one of the most fundamental problem areas in the majority of South African homes is insulation. 'Proper ceiling insulation is massively important in terms of regulating the temperature of your house. Using blinds or other window coverings to control the afternoon sun in summer and to retain heat during winter is also important.'

The biggest consumer of electricity (responsible for 30–40% of consumption) in most households is the hot-water cylinder. Insulating this power guzzler with a geyser blanket is easy to do and cheap to boot, says Eskom's general manager for business strategy and integration, Andrew Etzinger. And while you're up there you may as well check that the thermostat is set to the optimum temperature: between 50 and 60°C.

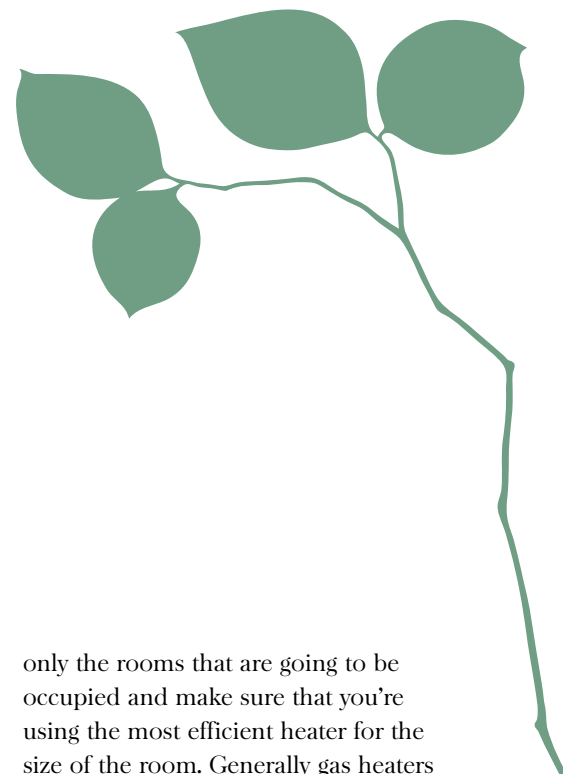
While on the topic of hot-water management, consider installing a low-flow shower head. These will reduce water consumption by 30% thereby lessening the amount of cold water flowing into the geyser. If you are the owner of an Italian designer shower head and are loath to lose it, fear not – the purchase of an R8.50 flow restrictor will convert your existing shower head to achieve just about the same level of saving as a low-flow fitting.

Another easy and relatively inexpensive way to reduce your home's energy demands is by changing your lighting. While CFL bulbs were the answer, their clunky design and size often made them an eyesore. 'Light-emitting diodes (LED) are very, very efficient and last a very long time. And one of their major advantages over CFLs is that they are more aesthetically appealing,' says Gear.

Earth Power in Cape Town imports a vast range of LED lighting solutions, some of which are dimmable, for a variety of applications, from domestic to commercial or outdoor use. Chris Lear from Earth Power says these bulbs offer a far more realistic alternative to the LED bulbs currently available at your local hardware store. The bulbs are available in cool and warm white, and emit varying levels of light. In addition, LED tubes are available to replace conventional fluorescent tubes in offices.

'The bulbs are not cheap. A 50W equivalent LED downlighter bulb will cost in the region of R250, but will have a useful lifespan of 30 000 hours – approximately six times longer than a conventional 220W bulb,' says Lear. Apart from an incredibly long lifespan, these bulbs use a fraction of the energy consumed by conventional and CFL bulbs.

In addition to these basic attempts to reduce your home's demand for energy, you can also use hot-water bottles and electric blankets instead of space heaters. Heat



only the rooms that are going to be occupied and make sure that you're using the most efficient heater for the size of the room. Generally gas heaters are more efficient than electric heaters. Oil heaters are mainly suited for heating smaller, enclosed spaces. Fan heaters are useful for quickly heating a small space but are not very efficient at all. Woolly jumpers are great too.

## MASTERCLASS

If you have the ability to advance from these basic energy-saving practices and technologies, the next step should be the installation of a solar hot-water system.

'Solar geysers are now a complete no-brainer,' says Gear. The cost is determined largely by the size and complexity of the system and the type of collector system you choose – flat-plate versus evacuated tubes, whether you'll be reusing an existing geyser or installing a new one, the size of the geyser, whether you'll be installing a geyser controller and so on. The rebate amount is determined not by the cost or size of the system, says Etzinger, but by the level of savings the system will realise. The greater the saving, the bigger the rebate.

Another technology that's slowly catching on is heat pumps. These make use of an electrically driven process that extracts heat from the air to warm water, essentially performing the reverse function of a refrigerator or an air conditioner.

'The energy saving achieved is comparable to that of a solar-heating system and installation cost is about the same,' says Hendrik Roux of Home Comfort in Johannesburg. This technology is not subject to the Eskom rebate system yet, but Etzinger says the power generator and the South African Bureau of Standards (SABS) are in the process of determining the criteria for certification. As with the solar-heating systems, the rebate will be determined by the energy saving.

Another relatively new technology is the use of thermal insulating roof paint. This paint, only available in white to maximise its reflective properties, contains ceramic beads that perform a similar function to the ceramic tiles fitted to a space shuttle, and could result in a cooling and heating bill reduction of 30-40%.

Now, if you're interested in making a major commitment, you could follow the route that Jon Adams, director of The Power Company, took three years ago when he retro-fitted his Johannesburg home with a full solar water-heating and power-generating system. The set-up consists of a few components. Firstly a roof-mounted 2.88 kW solar panel array is connected to the house's conventional wiring by means of a unidirectional inverter. There is also a bi-directional inverter that is used to charge either the 400 amp-hour, 48-volt DC battery bank, or to invert the battery power and feed it into the house.

And don't think that Adams and his family have to wait 30 minutes for the kettle to boil in a kitchen lit by the electric equivalent of a firefly. 'I run everything - fridge, freezer, tumble-dryer, dishwasher, washing machine, television - and I never have a warm beer and I never have a cold shower. All of our appliances are conventional appliances that you'd find in any normal home,' say Adams.

## *'We're now looking at a pay-back period of about eight years'*

The conversion was undertaken three years ago and cost in the region of R330 000, which included bringing out engineers from Germany (no longer necessary, with the expertise now in the country), the gas stove and gas water-heating backup system, as well as the solar water-heating system. With the more favourable current exchange rate, the components would cost about 30% less today.

Asked whether he'd calculated how long it would take to recoup his investment, Adams replies: 'I did, but that was before we had the recent massive increases. We're now looking at a pay-back period of about eight years. Of course, if the price of electricity goes up further that period will get even shorter.'

### **NEW BUILD**

Being able to build a new home is the ultimate position to be in when it comes to constructing an energy-efficient building.

The experts all agree that the most important step to achieving this goal is orientating the structure to optimise the heat of the sun during the cold winter months, thereby improving the thermal performance of the house and reducing the need for artificially generated heat. In the southern hemisphere this means building your house with its longest side facing north.


By the same token, a house with a northerly aspect should remain cool in summer. When asked about energy-efficient alternatives for air-conditioning systems, Gear says, 'A new building that requires air-con is an indictment of poor planning.' It needs to be said, however, that major advances have been made in

terms of air-conditioning technology, with most famous brands now producing units that use inverter technology to cool air, resulting in substantial savings of up to 60% over conventional systems.

The use of blinds to shield the interior from the afternoon sun, proper insulation and cross ventilation should ensure that the interior of any new building remains at a comfortable temperature. Etzinger also makes mention of the advances being made in new building materials, including the development of high-performance glass (not double-glazing), which has the same thermal properties as brick.

Naturally, the installation of a solar hot-water system or heat pump at this stage is a given. For the ultimate in comfort, have this system connected to an underfloor heating system that makes use of water pipes buried in the screed. This, together with a northerly aspect, should make for supremely comfortable winters.

Remember, when building a new house, to specify the insulation of hot-water pipes. There will be an additional cost, but this will easily be offset by the savings realised on your energy and water consumption.

There are no excuses any more. The technologies to run our lives more energy efficiently exist. As Etzinger says, 'Absolutely every light and appliance in your house has an energy efficient equivalent, and while they may be more expensive, for those wanting an energy efficient home, this is the way to go.' 

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**For more information on the products mentioned above, visit: [www.earthpower.co.za](http://www.earthpower.co.za), [www.homecomfort.co.za](http://www.homecomfort.co.za) and [www.thepowercompany.co.za](http://www.thepowercompany.co.za).**