

*SUMMARY VERSION*

# MY GREEN HOME

**Guide to saving money by going green**



Join the family that changed their home to  
help change the world

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# 1. INTRODUCTION

Perhaps you are concerned that your household is adding to environmental problems and contributing to climate change. Maybe you are looking for a way to reduce your spending on electricity and water. You might want to be less dependent on the electricity grid. Or all of the above.

Whatever your reasons, this guide and the lessons of one family that went on the 'My Green Home' journey are for you. The Green Building Council South Africa, with co-funding from the German government through the South African-German Energy Programme (SAGEN) which is implemented by [GIZ – German International Cooperation](#) and a set of sponsors and partners, spent six months working with one suburban family to green their home and show what is possible.

**See the 'Meet the Family' webisode:** <http://mygreenhome.org.za/webisode/meet-the-family>



In that short time, Zwelethu and Bulelwa Ngewana and their children, Lutholuthle (17) and Thulisa (22) made these savings:

- **Electricity consumption:** ↓ **53%<sup>1</sup>**
- **Water consumption:** ↓ **44%**
- **Waste to landfill:** ↓ **81%**

By acting on the ideas in this guide, you can make a difference too.

**See 4 minute summary video/ webisode:** <http://mygreenhome.org.za/>

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<sup>1</sup> The photo on the front page cover shows the family with their interim savings figures after 3 months, which were electricity 48%, water 45% and waste to landfill 81% by July 2014. The savings figures here have been updated at end of September 2014, and show increased electricity saving since July 2014.

### **But I don't have time . . .**

It's true, sometimes doing the greener thing takes time, but often it doesn't. Taking a short shower instead of a long shower or bath can save many hours of your time over the course of a year – and thousands of rands. We'll show you three things you can do in just one hour that would save a family like the Ngewanas about R4 500 in a year.

### **But I can't afford it . . .**

You will start saving right away with some of our No-Cost suggestions. With just a few hundred rands, you can start investing in some of our suggested Low-Cost greener technologies like low-flow shower heads and LED lights. Some of these can pay for themselves in less than a year and continue paying you dividends in lower utilities so that you can invest more. Work your way up to our Invest-to-Save ideas like a solar water heater or heat pump.

If you have money sitting in the bank, earning little or no interest, we have ideas – one of which is a new technology you've probably never heard of – that can pay returns of 20 percent or more. The Ngewanas will save at least R18 000 in the coming year. Can you afford *not* to start saving energy and water?

## **2. GREENING YOUR HOME: WHERE TO START**

What's the level of your appetite for greening your home? Hungry for the full-course meal? If you want to monitor your progress, count your savings and educate the family at the same time, just like the Ngewana family did, start here. You'll learn how to measure your home's consumption and create an easy eco-audit.

**See 'Where to Start' webisode:** <http://mygreenhome.org.za/webisode/where-to-start/>



Just want a nibble? If you would rather jump in and make a change here and there, you can skip ahead to the next section: No-Cost.



## Understand your consumption and costs

To set goals and monitor your progress, you first need to know how much electricity and water you have been using, and how much waste you're generating – your baseline. Gather your last 12 months of water and electricity bills. If your electricity is pre-paid, use your voucher receipts or phone your electricity provider for a record of your purchases. If you always purchase online, the website should be able to show your history.

You are not looking for rands, but rather kilowatt hours of electricity (kWh or “units”) and kilolitres (kL) of water. Add up your one-year total of each, taking note of how consumption shifts with the seasons. It's good to have a record of a few different baselines:

- The annual total
- The monthly average by season
- The daily average (divide by 365)
- The kWh/m<sup>2</sup>/year number

This last number is great for comparing one home with others of different sizes. Want to know how you measure up with the Ngewanas? In 2013, they used 41 kWh/m<sup>2</sup>/year.



They figured this out by dividing their kWh total for the year by the size of the home's usable floor space in square meters. My Green Home has a guide for [calculating your kWh/m<sup>2</sup>/year number](#)<sup>2</sup> or you can use [49M's online calculator](#)<sup>3</sup> even if you only have your kWh info for one month.

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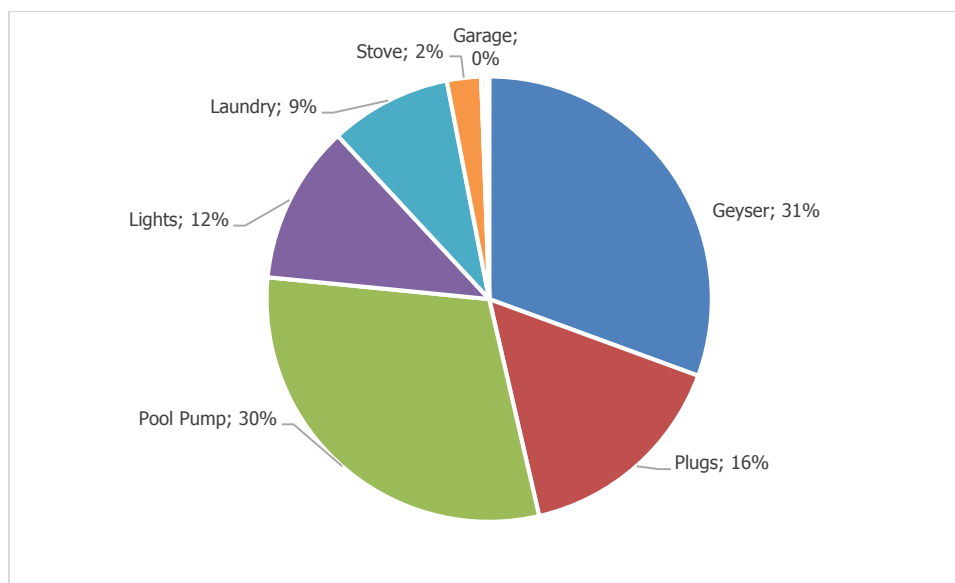
<sup>2</sup> [mygreenhome.org.za](http://mygreenhome.org.za). (Click on Where to Start, then under Useful Tools click “...calculate your home's annual number”.)

<sup>3</sup> [49mil.co.za](http://49mil.co.za)

## Do an eco-audit:

The Ngewana family had the benefit of eight electricity meters installed to monitor every segment of their consumption and a professional consultant to help them with an eco-audit.

The resulting pie chart below shows where electricity was being used in their home and reveals the electric geyser to be the largest contributor, as expected in any home with an ordinary electric geyser.



### *Ngewanas' electricity consumption as a percentage of total – Pre-Intervention Baseline*

You can get a similar analysis for free in a couple of hours. If you enjoy maths, calculators or spreadsheets, you can do a manual eco-audit by following the instructions from page 65 of the [Cape Town Smart Living Handbook](#).<sup>4</sup>

Or you can leave the calculations to Eskom's online [Comprehensive Energy Audit Calculator](#).<sup>5</sup> When you're finished, a pie chart shows how much electricity in your house goes for lighting, geyser, kitchen, laundry, pool, etc. You will also see suggestions for where you can save.

## Set your goals

Once you know how much water and electricity you consume, you can set savings targets.

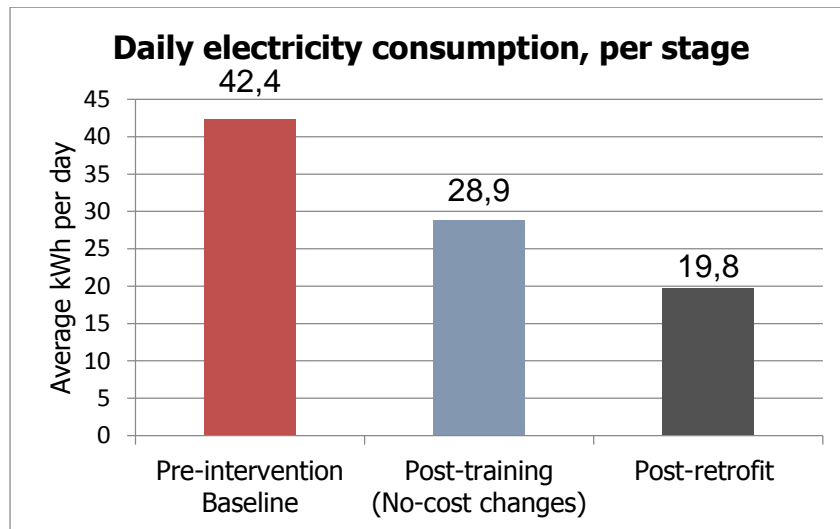
<sup>4</sup> [www.capetown.gov.za/smartliving](http://www.capetown.gov.za/smartliving)

<sup>5</sup> [www.eskom.co.za/sites/idm/Pages/Home.aspx](http://www.eskom.co.za/sites/idm/Pages/Home.aspx). (Click on "Calculate your energy costs".)

The Ngewana family set these goals:

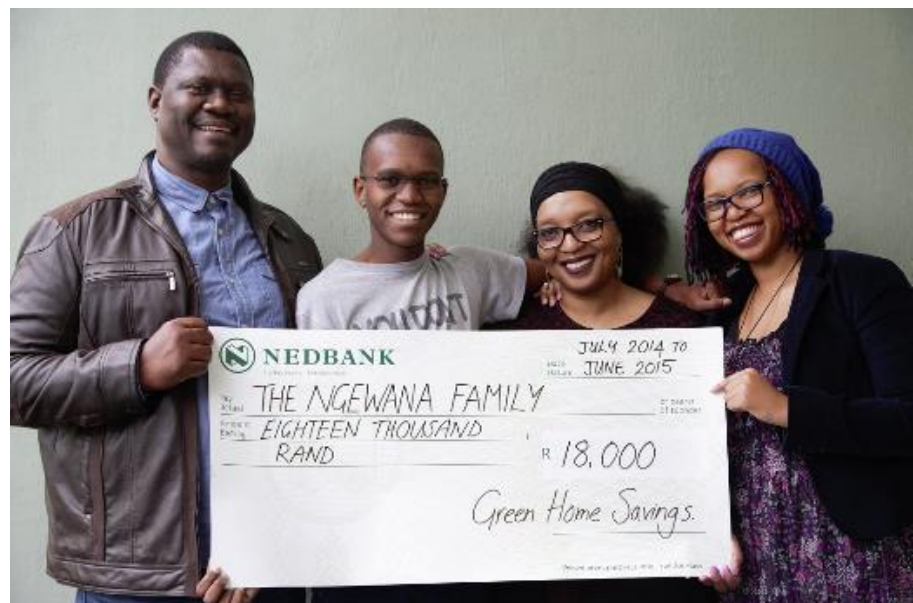
- **Electricity consumption:** ↓40%
- **Water consumption:** ↓20%
- **Waste to landfill:** ↓75%

Sounds ambitious? We believe that over time any household able to follow most of the No-Cost, Low-Cost and Invest-to-Save ideas on the following pages can meet and even exceed those goals. The Ngewana family did.



This graph shows the drop in the Ngewana family's electricity consumption as they made No-Cost behaviour changes only, and then a further drop once efficient equipment and devices were added.

They are set to save about R18,000 in the next year from electricity and water savings.



### 3. NO-COST ACTIONS

Without spending a cent, the Ngewana family managed to cut their electricity consumption by 32 percent in one month, just through changing the way they did things. (The pool pump override switch was on by mistake during the baseline period, and the pump running 24 hours a day. But even if the pump had been running normally, No-Cost savings would have been 27 percent.) They also reduced water consumption by 26 percent and waste to landfill by 81 percent through recycling and composting.

They had the advantage of training sessions with a sustainability consultant to show them how to save, but any family that can act on the following five suggestions should be able to cut their electricity consumption by 20 percent or more. Just the first three ideas had the potential to save the Ngewana family some R4 500 rand over a year for about an hour's effort.

If you would like to see more ideas, click here for the longer, [much more detailed guide](#).

#### **Turn your geyser down to 55°-60° degrees**

Most electric geysers are set to a scalding 65° or higher. Every 5° drop in the thermostat setting saves about 10 percent on water heating – and protects your family from accidental burns.



First switch off electricity to the geyser at the distribution board for your own safety. For some homes, the geyser may need to be set at 60° in winter to provide enough hot water, but test to see if you can drop it to 55° for the summer. To prevent bacteria and possible diseases like Legionnaires', don't set it below 55°. For detailed advice, see this [DIY guide to adjusting a geyser thermostat](#).<sup>6</sup>

Lutho Ngewana climbed into the roofspace and found their geyser set to 70°. He turned it down by 10°. This one action, combined with short showers (see below) helped the Ngewanas to reduce the electricity used by the geyser by 40 percent.

**For more ways to save on Hot Water, see webisode:**

<http://mygreenhome.org.za/webisode/hot-water/>



<sup>6</sup> <http://handytechtips.blogspot.com/2008/05/wheres-my-geysers-thermostat-how-do-i.html>



### **Don't work the pool pump overtime**

Whoever told you to run the pump 8 or 12 hours a day doesn't pay your electricity bill. Such long run times could make your pool one of your biggest power users, as the Ngewana family found out. Research shows that 4 to 6 hours is enough in summer for most pools and just 2 to 3 hours in winter, especially for smaller pools.



Zweli Ngewana usually had his timer set to 10½ hours. He brought that all the way down to 3 hours for winter and will try 4 or 5 in warmer weather. Even if he hadn't switched to a more efficient pump, reducing hours by making two seasonal timer adjustments alone would have saved him R2 500 in electricity over a year. A pool cover can further reduce the number of hours needed, especially if it blocks the light. Every pool is different, so monitor it and adjust the hours if the water does not stay clear.

### **Reduce the ironing pile**

A steam iron is one of the most energy-hungry appliances. The solution is not a higher-tech iron; it's a smaller pile of ironing. Avoid pressing wrinkles that will never be seen anyway. Underwear, fitted sheets, pyjamas and exercise gear don't need the energy wasted on them.



The Ngewanas' domestic worker, Vanessa, used to iron all of the laundry. When the family scrutinized their weekly ironing pile, only about a third of the laundry items really needed to be ironed.

### **Keep your clothes out of hot water**

No matter which model of washing machine you own, selecting the coldest water setting will use just a fraction of the power consumed by a hot wash. Don't be surprised if your whites start to look whiter. That grey look often comes from colours that have bled in hot water.



### **Take a short shower**

A bath typically uses 80 to 120 litres of water. A two-minute shower with a low-flow shower head uses at most 19 litres of hot water, consuming just a fraction of the water and energy needed for a bath or a long shower. That could save a few thousand rands worth of water and electricity per year for a family of four. The Ngewana family



held a shortest-shower competition among the family members; Lutho's two-minute showers won.

## 4. LOW-COST PURCHASES

Major investments like solar water heaters, heat pumps and variable-speed pool pumps yield some of the largest savings, but many kinds of green technology are affordable enough for limited budgets. In fact, some low-cost purchases — such as LED lights and low-flow shower heads — are obvious starting points when greening a house, with savings that will cover your costs quickly. At My Green Home, any investment less than about R1 000, including installation, counts as Low-Cost.

The Ngewana family made a range of low-cost additions to their home. The best five ideas are explained below.

### Replace your bulbs with LEDs



Light-emitting diodes (LEDs) are the lighting of the future, but you can start saving with them today. Though still relatively expensive, they are much cheaper than in the past and can often pay for themselves in less than a year. In fact, our calculations show that investing R100 in a 7 watt LED to replace a 50 watt halogen downlight that is turned on 5 hours a day pays such good dividends that it's like earning 32 percent annual interest over 5 years.

LEDs also last much longer than incandescent or even compact fluorescent lamps (CFLs). And you can now find LEDs in nearly any shape, in most wattages and in warm colours.

The Ngewanas' lighting was switched entirely to LEDs, inside and out. All lighting was sponsored by [Eurolux](#). The results were dramatic, with electricity for lighting falling by 74 percent so far.

**See Lighting webisode:** <http://mygreenhome.org.za/webisode/lighting/>



### Install a low-flow shower head

Replacing your shower head is a cheap and easy way to save both water and the electricity used to heat it. You can do it yourself, with the help of this [YouTube video](#).<sup>7</sup> And with modern, aerated shower heads, you will feel a blast of water, not just a trickle.



To see if you need a more efficient shower head, first do the 'Bucket Test'. Hold a bucket under the shower spray for 12 seconds and see if you collect more than 2 litres. If so, your current shower is using more than 10 litres a minute. Low-flow heads use less than 10 litres.

The Ngewanas did the Bucket Test on their showers and found that the flow rate ranged between 12 and 20 litres per minute. They upgraded to water-efficient models from [HansGrohe](#) using 6 to 9 litres per minute. For a family that showers regularly, reducing your shower water use in half with low-flow shower heads can cut water and electricity bills by thousands of rands a year — all for an investment of a few hundred rands.



### Put heat where you need it

If you must use electric heat in the winter, make sure it goes only where you really need it. An electric blanket, hot water bottle or fan heater all direct the heat to warm you up quickly. Infrared or quartz bar heaters are also efficient as long as you are in front of them. They don't heat the air, so switch them off as soon as you move away. Avoid underfloor and wall heating, which waste by warming indiscriminately. If you need to keep a room warm, an oil-fin heater works well, but make sure you close the doors and windows to keep the heat in. Buy heaters with timers and/or thermostats to avoid wasting energy. For large spaces like a lounge, a gas heater is even better.



**See Heating & Cooling webisode:** <http://mygreenhome.org.za/webisode/heating-cooling/>



<sup>7</sup> <https://www.youtube.com/watch?v=fiv4Zq9v4co>



## Keep your greens in the garden

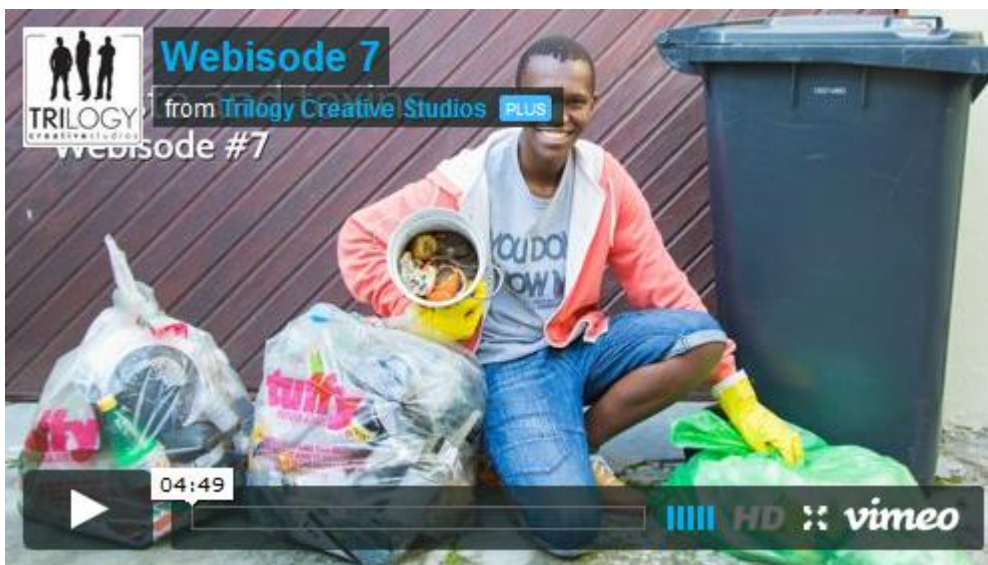
Recycling your paper, cans, glass and plastic is an essential part of any green home, but cooking and gardening can create a lot of waste, too. When you throw biodegradable refuse like food and garden waste in the bin, it goes to the landfill where it breaks down into methane, a greenhouse gas 21 times more potent than carbon dioxide. Rather keep your grass clippings

and other greens in the garden, turning them into fertilizer. You can start a compost heap at home for your kitchen fruit-and-vegetable offcuts and garden refuse. Keep the composting vegetation damp and regularly turned to speed up the process. Or you might let worms do the turning for you in a worm farm.

The Ngewana family reduced their waste to landfill by four-fifths (81%) by recycling and by using their compost heap and a small, R895 worm farm sponsored by [WizzardWorms](http://WizzardWorms).



**For more see Waste & Toxics webisode:** <http://mygreenhome.org.za/webisode/waste-toxics/>



## Stay secure with motion-sensor lights outside

Outdoor lights burning overnight will certainly lead to higher utility bills, but studies suggest they may also light the way for criminals to do their deeds, particularly if high walls shield the property from public view. Infrared motion-detector light fittings, which switch on for a pre-set time when something moves, are more likely to surprise unwanted visitors, while using less electricity. The Ngewanas replaced their exterior lights with LED motion-sensor floodlights.





## 5. INVEST-TO-SAVE PURCHASES

Some greening options might cost more up-front, but still save you money over time. Such expenditures should be seen as an investment, in both a future of lower utility costs and a healthier environment.

### Install a solar water heater

The question is not: “Can I afford solar?” It’s: “Can I afford to keep paying 40 to 60 percent of my electricity bill for a job the sun can do very well for most of the year?” The Ngewanas’ old geyser — and old water-wasting showers — would have used about R9 000 worth of electricity in the coming year. But judging from their September measurements, their new solar water heater has helped cut those costs by more than half.



The solar water heater was sponsored and installed by [SolarTech](#), but would have cost about R28 000 after a R9 000 Eskom rebate advanced by the installer. That expense would have been covered by savings within 4 to 6 years, a normal range for a family of four or more. The system carries a 10 year warranty.

The Ngewanas have a high-pressure system consisting of two 2.5m<sup>2</sup> flat panels with a 300-litre tank, mounted horizontally, immediately above the panels. The water is heated indirectly, using a glycol solution that flows to the tank without an electric pump, using the thermosiphon effect. It’s a system that would work well for many South African families. To learn more about how to choose a solar water heater, click here for the [My Green Home Step-by-Step Guide to Solar Hot Water](#).<sup>8</sup>

### Or consider a heat pump for hot water

If your home is shaded by large trees or the roof is not north-facing, it may not be suitable for a solar water heater. A great alternative is a heat pump, which works like an air conditioner in reverse, using less than half the electricity of a normal geyser. The cost is similar to or slightly cheaper than a solar water heater, and it also pays for itself in a few years. Bear in mind that a heat pump needs annual maintenance, doesn’t last as long as most solar panels and makes some noise. With both solar and heat-pump options available, almost no home should have to use an old-fashioned geyser.



The Ngewanas’ house has a heavily shaded outbuilding that now has an [Alliance](#) heat pump sponsored by Fourways Air Conditioning.

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<sup>8</sup> mygreenhome.org.za. (Click on Hot Water and then on Guide to Solar Water Heaters under Resources at bottom of page.)

### Buy a more efficient pool pump

The best-kept secret in home energy savings is a variable-speed pool pump. While most pool owners use 750w and 1100w pumps, these new models use only 150w to 300w at their lowest settings. Expect to pay R7 000 to R14 000 up front, compared to R2 000 for an ordinary pump, but you should earn all of that money back with a few years of electricity savings. Variable-speed pumps are also whisper-quiet and long-lasting.



The Ngewanas' old pump was one of the largest users of energy in the house. The combination of reduced hours and a new Speck Badu Eco Touch variable-speed pump has made this one of the most dramatic improvements in efficiency at the Ngewana household. Compared to their old pump running 10½ hours a day, they will save about R3 500 in the coming year.

### For more see Outdoor & Transport webisode:

<http://mygreenhome.org.za/webisode/outdoor-transport/>

### Give your fireplace a window

Open fireplaces may look charming, but you don't see the heat and pollutants whooshing up the chimney. Modern, closed-combustion fireplaces and wood stoves retain the charm while vastly improving efficiency by controlling the flow of air and keeping heat inside the home. Wood pellets, made from scrap wood and sawdust, or firewood from suburban tree fellers are also renewable fuels. Choose a wood-burner if the romance of building a fire inspires you; pellets are for those who value convenience.



The open fireplace in the Ngewanas' lounge was replaced with a Calore Piazzetta closed-combustion pellet fireplace. With the warmth from the fire and new insulation, the Ngewana family never needed their electric heaters this winter and greatly reduced their use of the gas heater.

### Protect your home with adequate ceiling insulation

Poke your head into the ceiling. If you don't see a thick coat of insulation, you're losing too much heat in the winter through the roof — and gaining too much in summer. A layer of glass wool or blown-in cellulose made from recycled paper saves energy and improves comfort.

Previously, there was no insulation in the Ngewanas' house. The entire ceiling was fitted with [Saint-Gobain Isover](#) fibreglass batts 135 mm thick. (R-value: 3.38) The family reported that their home was noticeably more comfortable this winter.



### Go green with gas

Whether heating a room or a pan on the stove, gas has the edge over electricity in supplying instant heat and defying load-shedding. Its green advantage is that switching from electricity to gas cuts the carbon footprint of those appliances about in half. Operating costs using bottled LPG in 2014 are similar to electricity for those paying about R1,50 per kWh; the lucky few in Johannesburg who can connect to Egoli Gas can save much more and have the convenience of not needing to replace gas bottles. Note that a gas installation needs to be done by an accredited service provider; comply with safety regulations.



### Choose an efficient refrigerator that makes the grade

Refrigerators and freezers vary widely in efficiency, so when buying a new appliance make sure you check the energy label. Labels are still voluntary in South Africa; if you don't see a rating, assume it's not efficient. SA labels max out at A, but with EU labels, aim for an A+ or A++ fridge. Also look at the estimated annual consumption in kilowatt hours, which matters even more. The cost of a much more efficient refrigerator will ultimately pay for itself in electricity savings in most cases, so it's like getting a new appliance for free! In the Ngewanas' kitchen, a new [Hisense](#) refrigerator has an EU energy rating of A+ and estimated consumption of 310 kWh per year.



**For more on Appliances see webisode:**

<http://mygreenhome.org.za/webisode/appliances/>



## 6. YOUR GREEN HOME

No home is perfectly green, but if each home is more efficient than it was the year before, we are making progress. This guide has been kept brief, but there are many more ideas for saving energy and water and reducing waste — and more detail on the ideas above — on the My Green Home website, [www.mygreenhome.org.za](http://www.mygreenhome.org.za), and in the longer version of this guide. And if you would like to multiply your impact, share this guide with others and spread the word about your steps to create your own green home.

### **If you're building a new home . . .**

Make it a certified green home by using the green building rating tool called EDGE all the way from the design through the construction process. It will also help you calculate upfront costs and potential long-term savings. The EDGE residential tool is available on the IFC website [www.ifc.org/edge](http://www.ifc.org/edge). [Contact the Green Building Council SA](mailto:edgepilot@gbcsa.org.za) on [edgepilot@gbcsa.org.za](mailto:edgepilot@gbcsa.org.za) if you wish to have your home certified.



# PRODUCT & SERVICE SPONSORS

The following sponsors have assisted in making this My Green Home possible:

- Eurolux – Lighting with LED products and ceiling fans - <http://www.eurolux.co.za/>
- Hisense – Efficient fridges and LED televisions - <http://www.hisense.co.za/>
- Breathecoat – Eco-friendly paints, varnish and waterproofing - <http://breathecoatpaints.com/>
- Calore – Wood pellet fire place - <http://www.calore.co.za/>
- Solartech - Solar water heaters - <http://setsa.co.za/>
- Saint-Gobain / Isover – ceiling and geyser insulations - <http://www.saint-gobain.co.za/>
- HansGrohe – Efficient showerheads, and aerators for taps and mixers - <http://www.hansgrohe.co.za/>
- Speck Pumps – Energy efficient pool pump and LED pool light - <http://www.speck-pumps.co.za/>
- Citrine Energy – Rooftop solar photovoltaic system - <http://www.citrine.co.za/>
- Snappy Chef – Induction and gas stove - <http://www.snappychef.co.za/>
- Water Rhapsody – Greywater and pool-side tank systems - <http://www.waterrhapsody.co.za/>
- Alliance / Fourways – Heat pumps - <http://www.allianceheatpumps.co.za/>
- Homebug – Real time home energy management system - <https://www.homebug.co.za/>
- Lecico – Dual flush toilets - <http://www.lecico.co.za/>
- Cycology – electric bicycles - <http://cycology.biz/>
- Vineyard Hotel – Accommodation - <http://www.vineyard.co.za/>
- Botanical Society of South Africa – Indigenous plants - <http://www.botanicalsociety.org.za/>
- Saint-Gobain/ Weber Tylon – Tiling - <http://www.weber-tylon.co.za/>
- Aquatrip – Home water management system - <http://www.aquatrip.com.au/>
- Cape Contours – Landscaping service - <http://www.capecontours.co.za>
- Green African Initiatives – mobile solar chargers-<http://www.greenafricaninitiatives.co.za>
- Woolworths – Efficiency related household products - <http://www.woolworths.co.za/>
- Reliance Compost – Compost and mulching - <http://www.reliance.co.za/>
- Skylite Concepts – Skylights - <http://www.solatube.com/>
- Geyserwise – Thermal control geyser management systems - <http://www.geyserwise.co.za/?page=1>
- Eco Smart – biodegradable cleaning products - <http://www.ecosmart.org.za/>
- Notre Energy – Electrical Services – <http://ne-solutions.co.za/>

- Natural Balance – Wonderbag heat insulation cookers - <http://nb-wonderbag.com/>
- Postwink – Recycling bins - <http://www.postwink.co.za/>
- Better Earth – biodegradable cleaning products - <http://www.betterearth.co.za/>
- Tierhoek Organic Farm – Organic produce - <http://www.tierhoekorganic.com/>
- City of Cape Town – Fleece blankets – <https://www.capetown.gov.za/>
- WizzardWorms – Worm farm for turning organic waste into compost - <http://www.wizzardworms.co.za/>