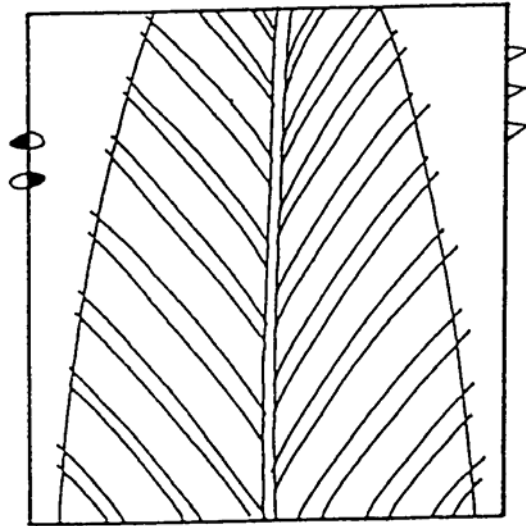


HOUSEHOLD APPLIANCES



Waitakere City Council
Te Taiao o Waitakere

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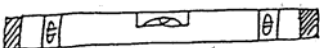
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This chapter is part of the Waitakere City Council's Sustainable Home Guidelines. The complete set can be obtained through most libraries or from the Waitakere City Council, Private Bag 93109, Henderson, Waitakere City 0650, New Zealand, phone (09) 839 0400, email:info@waitakere.govt.nz.

The guidelines are also available on the council's web site: <http://www.waitakere.govt.nz>.



How much energy do appliances need?

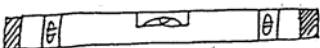
Some of the big users of energy are covered in the separate chapters on *Heating Water* and *Heating your Home*. As a rule of thumb you can assume that mechanical and electronic appliances use electricity reasonably efficiently, but anything which produces heat is likely to be quite wasteful, so there is the potential to achieve significant savings in the way you use it. After space heating and water heating, refrigeration is the next biggest user of energy in most homes. For up-to-date information on the costs of running home appliances, visit the EECA Energywise website: www.energywise.org.nz/yourhome/appliances

Cooling and freezing food

It takes very little electricity to keep a fridge or freezer at its correct temperature - if you keep the door shut. It's the opening of the door - how often, for how long - that sucks up electricity. As soon as you open the door, cold air cascades out like a waterfall onto the floor. The longer you have the door open the more the fridge has to work to cool down the air that drifts in to replace the cascade of cold air.

Other things you can do to achieve significant energy savings - as well as ensuring your fridge and freezer keep the food in best condition - include:

- The fridge temperature should be set at about +4 degrees for the fridge (so the lettuce is crisp but not frozen or soggy) – an extra degree lower on the temperature setting adds 5% to running costs.
- A freezer should be at about -18 degrees – ice cream is a good indicator.
- Keep the seals around the doors clean to prevent cold air leakage.
- Make sure there are air gaps around your fridge – air needs to circulate there to remove the heat generated by the condenser panels.
- Dust the condenser panel at the back if there is one: dust can reduce its efficiency by 5-10%.
- Don't put your fridge next to an oven or drier, and shade it from direct sun.
- Don't put warm food in the fridge – let it cool first.
- Cover food, especially liquids, in the fridge – moisture evaporates rapidly in a fridge, drying out food, condensing on the internal surfaces, and causing unnecessary defrost cycles.
- Defrosting wastes a lot of energy from your microwave or stove – let food defrost naturally in the fridge.
- Finally, if you notice that your fridge motor is running all the time, there is something wrong.



Buying a fridge

When buying a fridge, look for the star rating on the energy efficiency label. This label will also give you an estimate of average annual energy consumption in kilowatt-hours.

Match the size of a fridge or freezer to your needs: too small and cramped will reduce air circulation inside, resulting in uneven and ineffective cooling; too large will waste more cooling energy than necessary.

An energy-efficient fridge - with increased insulation and a high-efficiency compressor - can halve the energy consumption of a standard domestic model. However, the higher price tag of some imported models may make the payback period unattractive.

Make sure your new fridge doesn't contain the ozone-eating CFCs (chlorofluorocarbons) or HCFCs.

Combined-fuel fridges - capable of running on a gas bottle or battery - are designed for remote locations where electricity may not be available. It is very uneconomic to run such a fridge as a backup in your garage.

A top-opening chest freezer uses less energy than an upright freezer with a door since the cold air does not cascade out onto the floor every time you open it.

There's a good discussion of energy-efficiency of fridges and freezers at: www.energyrating.gov.au



Standby consumption

Many appliances have clock displays, permanently-on indicator lights, or the ability to be switched off with remote controls. Unless you switch them off at the power point they use energy continuously. Between 5 and 10 per cent of all New Zealand electricity – the equivalent of the output of the Clyde Dam – is wasted in this way.

Cooking

The conventional stove is a multi-purpose beast with big exposed elements that tend to spread the heat around rather than focussing it into the food you are cooking. A specialist appliance will generally use much less electricity. For example:

- an electric frying pan gets the element closer to the food, instead of being separated by two layers of metal and an air gap.
- an electric jug immerses the element in the water being boiled.
- a toaster puts the right-sized element right alongside the bread.
- a slow cooker surrounds the element and the food with insulation.

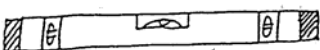
However, you have to use a specialist appliance often enough to justify the initial cost. And with intelligent use a conventional stove can be used in an energy-efficient manner - especially when you are cooking for a family or large group. Make sure the oven is well insulated and has a tight-fitting door that seals reliably all round. A convector fan boosts the efficiency of a conventional oven by about 20%.

Induction hobs offer instant, mess-free cooking that is also energy-efficient. Or, to get the best characteristics of two energy sources, you can combine an electric oven with a gas-fuelled cook top. A modern efficient double-combustion wood burner combines water heating and space heating with the cooking functions. See *Home Heating* for more.

While the effect of microwave ovens on food quality and health is still regarded with suspicion by some people, they can reduce cooking time significantly and use a fraction of the energy of conventional ovens, especially for smaller portions.

Whenever you cook, think of the most efficient way to use electricity:

- Use the heat for more than one dish. This is especially important with the oven, but you can also use steamer pots on the hotplates, or baskets in a pressure cooker (which can also reduce cooking times by two-thirds).
- Match your pots to the size of the elements - minimise the air you heat around the edges.
- Keep hotplates and their reflectors clean.
- Make use of a pressure cooker when you can – they are very efficient.
- Put cold water in saucepans or the kettle. Remember that if you turn on the hot tap the cold water that first comes out has already been heated and must be replaced in



the hot water cylinder by more cold water. It is more efficient to heat the water from cold when you need it. (See the chapter *Heating Water*.)

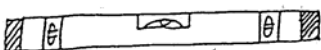
- Heat no more water than you need. Only just cover the vegetables - or use less water and steam them. Measure the cups into the electric jug. Ideally it will have a visible water-level gauge, as well as a thermostat or pressure switch to turn it off as soon as it boils.
- Once the water boils, turn it down. A seething pot is just evaporating faster than a simmering one - the water is no hotter.
- Keep the lids fitted tightly on pots when cooking.
- Keep the oven door shut - every time you open it hot air billows out and the temperature drops by 20 degrees.
- Don't overcook. Cooking food longer than necessary destroys flavour, nutritional value and wastes electricity. Most vegetables and some marinated meats and fish can be eaten raw.
- Slow cooking is an alternative method of enhancing flavour and nutrition. The food is heated up to temperature and then left to self-cook in an insulated container. This is the principle of the slow cooker. Or you can improvise the insulation yourself.
- Turn off the oven well before you're ready to serve up. The food will continue to cook - so long as you leave the door shut.

Washing dishes

Whether you wash by hand or machine, full loads are more efficient.

- Don't turn the dishwasher on till it's full.
- There is no advantage in doing separate loads for different types of dishes.
- If your dishwasher has the ability to heat its own water, use it – it's more economical than using hot water from your cylinder.
- Use the economy wash and economy drying cycles - open the door a bit when the wash finishes to aid drying
- Whatever you do, don't pre-rinse the dishes with hot running water - just two minutes will use up as much electricity as the full dishwasher cycle
- Put the plug in or use a bowl, and rinse the dishes in cold water.

Two-drawer dishwashers save energy as well as being more convenient and flexible in their use. Some dishwashers are more energy- or water-efficient than others. If you're buying a dishwasher, look for an efficient one: *Consumer* does tests and there are databases which rate appliances for energy and water efficiency. See the references.

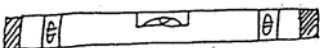


Clothes washing and drying

By far the most inefficient way to use electricity is to produce heat with it. Nothing illustrates this so well as a washing machine. Despite all the noise of agitation, rinsing, pumping and spinning, the mechanics of a washing machine use only 5% of the electricity. The other 95% goes into heating the water. That's if you choose to do a hot wash - most people these days prefer a cold wash, saving a lot of electricity and money in the process. Every few months you should probably do a hot wash to flush out deposits in the pipes.

If you do insist on hot washes buy a front-loading machine. Its tumbling action washes effectively with less than half the hot water of a top-loader; and also produces less wear and tear on the clothes.

Do you really need a drier? If you do, a drier is an appliance with enormous potential for saving electricity. Pay a little bit extra to get a built-in sensor that will switch it off once the clothes are dry. This saves energy and protects your clothes from over-heating damage. And get a model with a vent that you can connect directly to the outside. Otherwise you can end up re-circulating damp air through the drier, which reduces its efficiency and causes humidity, condensation, and mould inside your house.



Of course the best way to avoid the energy drain of a drier is not to use it. Even in winter you can improvise natural drying by using lines under a veranda, or an indoor rack near an open window – but remember the open window, otherwise the moisture from the clothes will increase the indoor humidity and may cause condensation and mould. Your clothes get a fresher and less wearing dry from the natural elements of sun and breeze.

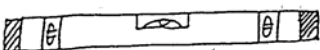
As with most appliances - even more so in the laundry - the greatest opportunity for savings is in the way you use them.

- Use cold water washes (with a hot wash every few months to keep the machine in good running order).
- If you have a smaller load, use a lower water level – or wait till you have a full load.
- Spin on “fast” to dry out the clothes more before you put them in a drier.
- Clean the lint filter every time you use the drier. This allows the air and moisture to escape so the clothes dry quickly. Reflect also on how much fibre the drier is stripping from your clothes.
- Use the lower temperature setting on the drier – although it takes longer it is kinder to your clothes and uses less energy.
- If you don't have the drier vented to the outside, open the nearest door or window and angle the vent grill towards it.
- Use alternatives to the drier: a washing line, lines under a veranda, a rack by an open window.

Other appliances

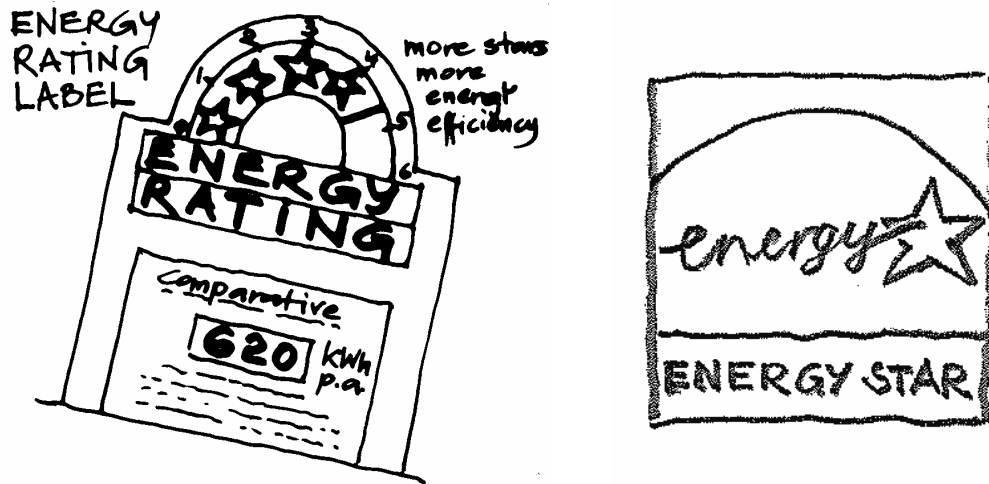
Most of the big users of energy have been covered above and in the separate chapters on *Heating your Home* and *Heating Water*. But there are still useful things to remember about the way we use other appliances:

- Empty your vacuum cleaner's dust bag often - it will suck better and save time and electricity.
- If you must run a waste disposal unit in your sink, then use cold water only. However it's better to compost organic waste than to send it off to the water treatment plant.
- Use electric blankets for pre-heating only - a good duvet will then give you a healthier warm sleep through the night, or use a hot water bottle.
- Insulate a water bed to reduce heat loss during night - use a time switch or a demand switch rather than continuous heating.
- Don't use a faulty appliance - it will generally use more energy as well as being a safety risk.
- Avoid unnecessary appliances like electric-powered toothbrushes, can openers, fitness gear, etc. - it's healthier and more sustainable to use your own natural energy.



Buying appliances

When we buy appliances we compare prices, but the price is only the first cost. The appliance will also impose running costs throughout its life – mainly through energy use – and energy efficiency can vary greatly between different models. You can calculate the energy costs (see table next page), or you can take advantage of the Star Energy Rating Scheme.



The Star Energy Rating label on appliances is a joint government and industry programme for Australia and New Zealand. It compares models in their typical energy use, measured in kilowatt-hours per year. You can use this to calculate running costs (multiply the number in the red box by the current unit price of electricity), or you can take your lead from the star rating. The label features an arc of 1 to 6 stars. The more stars it displays the more energy efficient the appliance is relative to conventional appliances of the same type.

An appliance with the Energy Star logo has been appraised as being the most energy-efficient of its type.

What does it cost to run an appliance?

Calculate your own running costs – or get your kids to do it.

All appliances have a power rating in Watts marked on them. It is often expressed simply as “W,” as in a “60W” light bulb. Large appliances may be rated in “kW” – 1,000 Watts.

A unit of electricity is a kilowatt-hour. This is the equivalent of running a 1,000W appliance for 1 hour, or a 100W appliance for 10 hours. You can find the unit price on your most recent power bill.

So to calculate the running costs of any appliance:

Take the power rating in Watts

Multiply by the unit price in cents

Divide by 1,000

This gives you the running cost per hour in cents.

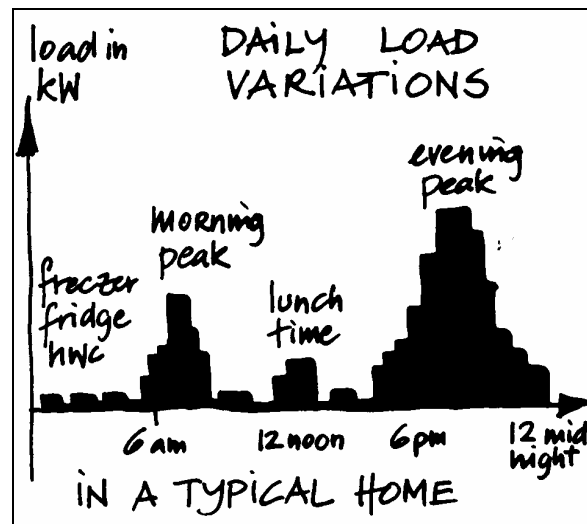
You then estimate how many hours you are likely to use the appliance over the course of a year. Multiply the two figures and you have an annual electricity cost for running the appliance.

Remember that in some cases – e.g. a washing machine – you may have to add on the cost of electricity used in the hot water cylinder for each wash.



Getting cheap electricity

Household power use varies over 24 hours, as illustrated in the graph below. The peaks in power usage are a problem for our national generating system – it is the peak capacity rather than the total energy usage that causes new dams, power stations, and transmission lines to be built. Some power companies therefore offer price incentives to get us to switch electricity use more to off-peak times. These incentives can save us money as well as helping to avoid the need for future dams. Check with your retailer or with Consumer Power-switch whether this is available in your area.



Another option if you use only a small amount of electricity is the “Low Capacity” special price package. You are charged a higher rate for the units you actually use, but a lower daily line charge.

In the rapidly changing market regime for energy companies, you will get a greater choice of tariff options and more sophisticated analysis of your energy usage in the future. Keep an eye on the newsletters you get with your power bill, or check directly with your retailer.

You can also buy devices to help you monitor your own power use. You can use them to identify which appliances are costing you the most, or to alert you to the periods when your demand is greatest.

Further information

Advice at the Waitakere City Council:

Phone the call centre (09) 839 0400
Ask for: Eco Design Advisor
Cleaner Production
Ecowater

In print

Your Home Technical Manual, Australian Government. A comprehensive printed resource, much of it relevant to New Zealand.

On the web

www.smarterhomes.org.nz is a mine of up-to-date and independent information. Designed for the general public, it's easy to use, has case studies, and includes features such as Homesmarts, a calculator you can use to find information relevant to your needs or simply to run a home-health check.

If there are questions you can't find answers to on Smarterhomes, www.level.org.nz goes into more depth and is aimed at the design and building industries, with drawings and links to Building Code compliance documents.

Consumer, www.consumer.org.nz Power-switch, www.consumer.org.nz/powerswitch

Energy Efficiency and Conservation Authority, www.energysave.org.nz. The brochure "Getting warmer by degrees" is available on this site, or from the council.

Australia -NZ rating schemes for an assortment of appliances, fully searchable and updated regularly.

Energy rating, www.energyrating.gov.au

Water rating, www.waterrating.gov.au

Eco-building Products and Services Directory, Building Biology and Ecology Institute, phone Auckland 909) 376 6767, Wellington 0800 223 272. This is updated regularly and can be obtained from the website www.ecoprojects.co.nz.

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