



Australian Government



YourHome

Australia's guide to environmentally sustainable homes

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Appliances

Appliances ([/sites/prod.yourhome.gov.au/files/pdf/YOURHOME-4-Energy-5-Appliances-\(4Dec13\).pdf](/sites/prod.yourhome.gov.au/files/pdf/YOURHOME-4-Energy-5-Appliances-(4Dec13).pdf)) [PDF 5.5 MB]

Household appliances and equipment account for about one-third of energy consumption and about 45% of greenhouse gas emissions in the average household.

Projected average home energy use in 2012 — actual energy use varies from state to state (particularly with climate) and from home to home depending on the appliances in the home and how they are used.

Household energy use	%
Heating and cooling	40
Water heating	21
Appliances and equipment including refrigeration and cooking	33
Lighting	6

Appliances and equipment energy use data	% (of the 33% above)
Fridge freezer	18
Cooking	15
TV	19
Home entertainment	5
Home office	9
Pool and spa	5
Stand-by	10
Microwave	2

Dishwasher	2
Clothes dryer	2
Clothes washer	2
Miscellaneous	11

Source: DEWHA 2008

They make up one of the four main areas of energy usage in your home. The others are covered in: Heating and cooling; Hot water service; Lighting.

Careful selection of appliances and equipment can save money and reduce environmental impact without compromising lifestyle.



Common considerations

Purchase and selection

If you are thinking of buying an appliance, ask yourself: Do I really need it? The sun and a clothesline, and an indoor drying rack for wet weather, have almost no cost. A second fridge or third TV may be unnecessary. Without that extra appliance, think of the savings in buying and running costs, and its environmental impact from manufacture, use and disposal.

If you do need it, choose the right appliance size for your needs. A large model with the same star rating as a smaller model uses more energy and generates more greenhouse gas. Ensure the retailer considers the best size appliance for your needs.

Purchase the most efficient appliance available by choosing the highest rating product — many have appliance rating schemes to help. For detailed reviews of product performance, seek advice from consumer groups, such as Choice (www.choice.com.au (<http://www.choice.com.au/>)).

Operation and running costs

Operate appliances efficiently by closely following the instructions.

Turn appliances off when not in use, preferably at the power outlet. Many appliances continue to draw stand-by power when switched off, which can contribute up to 10% of household electricity use (the estimated average stand-by draw on household energy is 4%).

Consider the full lifetime cost — including ongoing costs of maintenance and operation — when choosing an appliance. Ongoing running costs can easily exceed the appliance's original purchase price.

Energy efficient appliances can save hundreds of dollars each year in running costs.

Energy efficient appliances cost less to run and have less environmental impact than similar appliances with poorer energy efficiency. And they can save hundreds of dollars each year in running costs.

Maintenance

Maintain appliances carefully. Poor maintenance can lead to higher energy use. A poor (leaky) seal on a refrigerator door or a clogged filter in a dishwasher can significantly increase running costs and reduce the appliance's performance (more icing up in the refrigerator, more deposits remaining on dishes).

Disposal

When your appliance or equipment comes to the end of its life carefully consider its disposal. Most appliances are full of valuable materials and some parts can be recycled. Talk to your local council about recycling programs in your area.

Dispose of old fridges and air conditioners properly to avoid release of ozone damaging CFCs. Your local council should be able to offer advice, or visit the ozone depleting substances and synthetic greenhouse gases website [www.environment.gov.au](http://www.environment.gov.au/protection/ozone) (<http://www.environment.gov.au/protection/ozone>).

Whenever possible purchase products that are specifically designed to be recycled.

Building design

Layout and placement of appliances can be used to maximise efficiency in a new kitchen or laundry.

Locate refrigerators and freezers out of direct sunlight and away from other sources of heat such as ovens and stoves. This is an important consideration in kitchen design.

Locate appliances that require hot water as close to the hot water service as possible to reduce heat losses in pipes.

Where possible choose appliances that are not only energy efficient but also have a high rating for water efficiency. (see Reducing water demand)

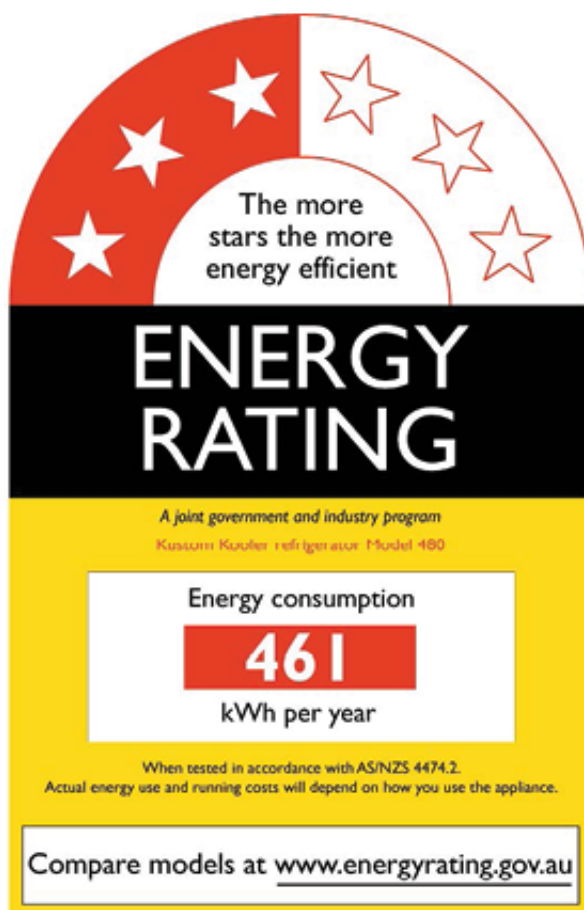
Choose appliances that have high ratings for both energy and water efficiency.

Key sources of information

Energy Rating Labelling Scheme

The Energy Rating Labelling Scheme is a mandatory scheme for a range of appliances including:

- refrigerators
- freezers
- clothes washers
- clothes dryers
- dishwashers
- air conditioners
- televisions
- swimming pool pumps (voluntary only at this stage).



Choose an appliance with a high star rating.

The Energy Rating Label on new appliances shows the star rating and other useful information about energy consumption. Choose an appliance with a high star rating.

For comparable products, appliances with a higher star rating generate fewer greenhouse gas emissions.

For comparable products, appliances with a higher star rating generate fewer greenhouse gas emissions.

The Energy Rating Label must be displayed on the listed appliances when offered for sale. The label's star rating shows 1–10 stars for refrigerators, freezers and TVs; and 1–6 stars for the remaining whitegoods. The more stars the higher the efficiency. Total energy consumption in kilowatt hours (kWh) per year under test conditions is also shown (in the red box). If two suitable appliances have the same star rating, choose the one with the lower energy consumption.

The Energy Rating Scheme website (www.energyrating.gov.au (<http://www.energyrating.gov.au/>)) details additional information such as the energy rating and approximate annual energy costs for all appliances on sale in Australia. Add the purchase cost and the lifetime running cost to get a more accurate picture of the total cost of an appliance.

Use the website to search for an appliance that best meets your needs. And read the tips on appliance selection and background information on how appliance ratings are determined.

Water Efficiency Labelling Scheme

The Water Efficiency Labelling Scheme (WELS) is a mandatory national labelling scheme for a range of products (see Reducing water demand).

The WELS label must be displayed on clothes washers and dishwashers when offered for sale. The label's star rating has 1–6 stars, and the greater the number of stars the higher the water efficiency. Total water consumption per wash cycle under test conditions is also shown (in the blue box). If two suitable appliances have the same star rating, choose the one with the lower water consumption.

Saving water also saves money, reduces greenhouse gas emissions and puts less strain on waterways.

Since 1 November 2012 all new clothes washers must meet a new minimum water efficiency standard. Machines with a capacity of 5kg or more must have a water efficiency star rating of at least 3 stars; and machines with a capacity of less than 5kg must have a water efficiency star rating of at least 2.5 stars.

The Water Efficiency Labelling Scheme website at www.waterrating.gov.au (<http://www.waterrating.gov.au/>) has additional information on the scheme.



The WELS label shows water use efficiency and total water consumption for the appliance.

Choice

Choice, the public face of the Australian Consumers' Association, frequently benchmark tests products, including a full range of appliances. It publishes the results of these tests in its magazine *Choice* and online at www.choice.com.au (<http://www.choice.com.au/>) for a fee. Most

public libraries subscribe to *Choice*.

The tests often provide information on energy efficiency, water efficiency and environmental impact. They also cover features such as price, safety, warranty details and performance. Use all the information to help choose the best appliance for your needs.

Whitegoods

Refrigerators and freezers

Refrigerators and freezers have been energy labelled since the late 1980s and subject to strict Minimum Energy Performance Standards (MEPS) since 1999. The refrigerator or freezer you can buy today is far more energy efficient and cheaper to run than those manufactured before 1999. By 2009 refrigerators were on average using approximately 40% less energy than equivalent refrigerators built in the first half of the 1990s.

Choosing a fridge or freezer

Running costs can be significant for refrigerators and freezers so it's worth purchasing the most energy efficient (highest star rated) refrigerator or freezer you can. A 1.5 star rated 350L refrigerator uses approximately 550kWh/year whereas a 3 star rated refrigerator of the same size uses only 350kWh/year, a saving of 200kWh/year or 36%. That's approximately \$45 in electricity costs a year or \$450 over a 10 year life (based on an electricity tariff of 22.5 cents/kWh, the national average in 2012). A higher rated refrigerator costing a few hundred dollars more is worth the added investment in efficiency over its life.



Today's refrigerators and freezers use about 40% less energy than those of 15 years ago.

Buy appliances no larger than the size you need.

Buy appliances that are the right size, especially freezers as their energy demand is high. A larger model uses more energy than a smaller one with the same energy star rating. A single large fridge is usually more efficient than two smaller ones.

Look for features such as easily adjustable shelving, easy access to the thermostat, simple thermostat controls, separate thermostats for fridge and freezer compartments, a door-open alarm and rollers or castors that make cleaning and operating the fridge easier.

Chest freezers are usually more efficient than upright models as cold air does not escape every time you open the door. Upright freezers with enclosed drawers (not baskets) are a good compromise.

Through-the-door features such as cold water dispensers and ice-makers use more energy and cost more to buy. Upright units with one door above the other are generally more efficient than units with side by side doors.

A cool cupboard keeps many fruits and vegetables well in most climates, allowing you to choose a smaller fridge. Locate the cool cupboard in the coolest part of the house and have good airflow in at floor level and out at the ceiling but be careful to ensure that the cupboard

has a well sealed door to prevent loss of heated air from your home in the cooler months.

Keep fruit and vegetables in a cool cupboard and buy a smaller fridge.

Using your fridge or freezer

- Place the fridge or freezer in a cool spot out of direct sunlight and away from cookers, heaters and dishwashers.
- Leave an adequate air space — 75mm is desirable — around all sides of the cabinet (see your user guide). In an alcove make sure the top is also ventilated (again, 75mm clear space above). Many modern 'clean back' refrigerators without visible coils need to lose heat from their sides as well as backs. Adequate clearance between the fridge and surrounding cupboards is even more important.
- Make sure the door seal is clean and in good condition. It should hold a piece of paper tightly in place when shut.
- Set the fridge thermostat to between 3°C and 5°C, and the freezer to between -15°C and -18°C. Every degree lower requires 5% more energy. A fridge thermometer is a good investment.
- Avoid overloading the fridge or freezer. Try to leave about 20% free space for air circulation.
- Defrost manual models frequently or when ice is more than 5mm thick. Ice build up significantly increases energy use.
- Empty and turn off a second fridge when not needed. An older refrigerator could easily be costing \$200 or more a year to run. Do not locate it in a hot garage or veranda.
- Avoid placing hot food in the fridge — it just makes your fridge work harder. Let it cool first.

Clothes washers

Choosing a washing machine

Choose a washing machine that's the right size for your needs. An oversized model is often filled with partial loads.

Select the most energy and water efficient model within your budget.

Front loaders are usually more water and energy efficient. They are gentler on clothes, use less detergent and save space as they can be installed under a bench. They usually have a higher spin speed so clothes come out drier. However, some front loaders have only a cold water connection and some take a very long time to complete a wash. Check these details before buying.

Front loaders are usually more water and energy efficient, and gentler on clothes. They use less detergent, save space and produce drier clothes after a high-speed spin.

Look for models with dual water connections (cold and hot). Washing machines with a cold water connection only use an internal heater to heat the water. Your gas, solar or heat pump type water heater, if you have one, heats water less expensively and produce fewer greenhouse gas emissions (typically more than 50% less) than a washing machine.

Make sure the washing machine you buy includes cold wash program options. Some clothes washing machines may heat the water to a moderate temperature during the 'cold' wash program — to ensure detergent dissolves and cleans properly in cold climates such as Europe. Ask the retailer or product supplier whether the machine heats the water internally for a cold wash program. A warm or hot wash can generate up to 4kg of greenhouse gas per wash, a cold wash less than 0.5kg (www.yourenergysavings.gov.au (<http://www.yourenergysavings.gov.au>)).

Clothes washing machines that include manual load size selection or auto load sensing features are preferable. Such features allow the machine to use less energy and water when washing less than a full load.

Models with a high spin speed are also desirable, especially if you use a clothes dryer. Top of the range models with spin speeds of 1800 rpm or more can extract twice as much moisture than models with only low spin speeds (less than 800 rpm).

Look for machines that offer an 'economy' cycle, which often washes perfectly adequately (particularly for lightly soiled clothes) while saving both energy and water.

Using your washing machine

Wash a full load rather than several smaller loads and use the suds saver if available. Don't use too much detergent. Making detergent produces a lot of greenhouse gases and using too much pollutes our waterways. If your machine has an economy cycle option use that to save energy and water.

Most of the energy used in washing clothes is for heating the water. Use cold wash programs whenever possible. Most wash loads are relatively clean and a cold wash gives a perfectly satisfactory result. A 3 star rated 6kg capacity clothes washing machine used once a day on a warm wash uses approximately 300kWh of electricity per year but as little as 60kWh a year when used on the cold wash program. This represents a saving of more than 80% or approximately \$54 per year.

Washer dryers

Some clothes washers can also dry your clothes. These combination washer dryers are always front loading machines. They can save considerable space (i.e. one appliance instead of two), so are particularly useful in an apartment.

Watch out for washer dryers that use water during the drying phase (to cool the drum of the machine and condense water evaporated from the clothes). In some cases the water consumed during the drying phase can exceed that used to wash the clothes. For more information go to: www.waterrating.gov.au (<http://www.waterrating.gov.au/resource/water-consumption-washerdryers>)



Dry clothes on a line or rack whenever possible.

Clothes dryers

Choosing a clothes dryer

Consider buying a gas fired or heat pump model clothes dryer. They are more expensive to buy and install but much cheaper to run. This is particularly relevant if you are unable to dry clothes outside and must use your dryer frequently. A standard electric 5kg dryer used daily uses approximately 1500kWh per annum, for about \$340. A heat pump type dryer costs about one-third that much to run.

Look for an 'auto-sensing' feature on your dryer, which automatically stops the dryer as soon as clothes are dry. Also look for easily accessible lint filters and other features such as reverse tumbling and special fabric cycles.

Using your clothes dryer

Drying a load of washing in an electric dryer generates more than 3kg of greenhouse gas (www.yourenergysavings.gov.au (<http://yourenergysavings.gov.au>)). Whenever possible, dry clothes on a clothes line or rack instead of in a dryer.

- Avoid overloading or over-drying, which wastes energy.
- Don't put wet clothes in the dryer. Part dry or spin dry them first, using the maximum spin speed of the washer.

- Clean the lint filter after each load.
- Externally vent the dryer to remove moist air from the room (does not apply to condenser type dryers).
- Run the dryer on medium instead of high: it takes a little longer but uses less energy and is less damaging to your clothes.

Whenever possible, dry clothes on a clothes line or rack instead of in a dryer.

Dishwashers

Choosing a dishwasher

A modern dishwasher can wash a full 12-place setting with less than 14L of water, typically significantly less than the amount used when handwashing dishes.

Choose the right size for your needs so you won't always be washing partial loads. Two-drawer and benchtop models are available and can be more efficient in households where frequent small loads are washed.

Select the most energy and water efficient model.

A modern dishwasher typically uses significantly less water than handwashing dishes.



Modern dishwashers typically use significantly less water than handwashing dishes.

Older dishwashers use significantly more energy and water than newer models (typically the more water used the more energy used by a dishwasher). On average a dishwasher manufactured in the early 1990s uses twice as much water and 40% more energy to wash the same sized load as a current day model (Energy Efficient Strategies 2010).

Look for models with hot and cold connections or cold connection only. Hot connection only models use much more energy as the whole cycle uses hot water, not just the wash phase.

Before buying your new dishwasher, research performance well. Apart from referring to the energy label, check sources such as *Choice* magazine for more detailed information on such things as washing and drying performance, noise, ease of use and so on. Also check that the basket and rack design suit your dishes.

Look for models with an economy cycle. Some models also offer a 'half wash' mode that washes the lower basket.

Some newer models now store the water from the last rinse to use for washing the next load. These models have very low water consumption.

Using a dishwasher

- Scrape plates well before packing the dishwasher and keep pre-rinsing to a minimum. Most modern dishwashers can easily deal with the remaining soil following scraping alone, so be smart, save water and time, and minimise rinsing.
- If you do pre-rinse, don't use the hot water tap, which is very wasteful of energy.
- Do not over-pack your dishwasher — it gives poorer wash performance.
- Always clean the filter between washes.
- Run the dishwasher only when fully loaded.
- Use cold water cycles as much as possible in dishwashers. Select the cycle with the lowest temperature and minimum time to get the job done.
- Avoid using drying cycles — open the door instead.
- Use the economy cycle. Using a high quality detergent and eco-wash (and cleaning the filter after every load) can often give better cleaning results than a normal wash with a cheaper detergent. The energy and water savings offset the cost of the more expensive detergent.

Home entertainment and home office equipment

Ownership and hours of use of home entertainment and computer equipment is increasing. A large screen (106cm) 3 star rated TV on for 7 hours a day uses around 450kWh a year (generating around half a tonne of greenhouse gases) — more than an average sized (420L) 3 star family fridge, which uses about 410kWh/year. The ubiquity of computers, with associated scanners, printers, additional displays and 24-hour internet access, makes them a significant part of energy use in the home.



A large screen (106cm) 3 star rated TV on for 7 hours a day generates more greenhouse gas than an average sized 3 star family fridge.

The keys to minimising energy use from this range of equipment are:

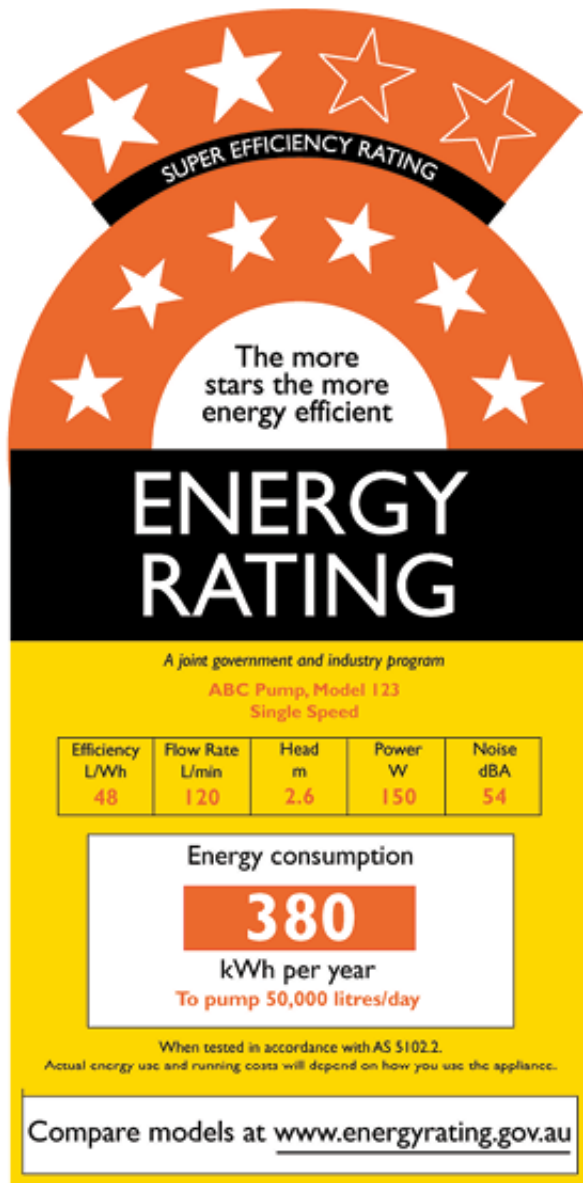
- Avoid buying equipment you don't need.
- Choose equipment that is the right size for your needs.
- Use efficiency data when available (e.g. www.energyrating.gov.au (http://req.energyrating.gov.au/comparator/product_types/)) to select the most efficient products. In many cases the cost of running equipment can exceed the original purchase price.
- Turn appliances off when not in use, preferably at the power outlet (or use a stand-by power controller). Many appliances continue to draw stand-by power when switched off at the unit.

These products are covered in more detail in Home entertainment and home office equipment.

Swimming pools and spas

About one in six Australian homes has a pool, and about 16% of electricity used in those homes is consumed by pools and spas.

Australian households with a pool, particularly a heated pool or a spa, spend up to one-third of their total energy bill on the pool.



The label scheme for pool pumps is voluntary.

All swimming pools and spas use energy for pumping and filtration. An average sized in-ground swimming pool uses approximately 1250kWh of electrical energy per year for pumping and filtration (that's \$280 at 22.5c/kWh); spas use on average about 330kWh/year (\$75). A salt chlorinator used in your pool adds approximately 290kWh/year.

If you are setting up a new pool or spa or need to replace an existing pump, choose high efficiency pumps, which are typically 'multi or variable speed drive' pumps. Many pumps now come with an Energy Rating Label (the labelling scheme is voluntary at present), so choose a pump with a high star rating. Some pump models now have ratings of up to 8 stars.

The most significant energy use in pools comes from heating. If you must heat your pool, choose solar heating in combination with a pool blanket that traps heat to help keep your pool warm. Solar heating requires only a moderate amount of energy for pumping (1000kWh/year on average) and is relatively inexpensive to operate (approximately \$200/year). Gas heating uses 10–20 times more energy than a solar heater.

If you currently use gas or electric heating for your pool consider switching to solar.

Using your pool and spa

Gas or electric pool heaters use a huge amount of energy, so keep your pool only as warm as you need it. Try reducing your pool or spa temperature by 1°C or 2°C, which can easily save 10–15% of your heating costs.

Cutting back on pump running time can also save energy, dollars and greenhouse gas emissions. But be careful to ensure water quality is not significantly affected.

If you are not sure how to reset the temperature or pump running times you might want to schedule a service appointment with your pool service company. Ask them to set your temperature and pump running times and show you how to do it.

Clean the pool and pool filters frequently.

If you are heating your pool and or spa, pull a cover over it whenever it's not in use.

References and additional reading

Contact your state, territory or local government for further information on energy efficiency. www.gov.au (<http://www.gov.au/>)

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Water Efficiency Labelling and Standards (WELS) scheme. www.waterrating.gov.au (<http://www.waterrating.gov.au/>)

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