
meridian
Energy and cost savings
Advice for your business
ELECTRICITY SAVINGS™
save money & the environment
October 2008

! Setting your heating control down 1°C can save up to 10% in some systems.

At Meridian we're committed to helping you find ways to save energy in your workplace at little or no extra effort or cost.

We all have a role to play

As New Zealand's largest electricity generator, we take our responsibilities to New Zealand and the environment very seriously. We generate all our electricity using renewable resources – water (hydro) and wind. Using our resources wisely and efficiently today protects our environment and helps make sure we'll have ongoing supplies of energy for generations to come.

Whatever business you're in, you have the potential to save money in running costs through careful energy management. By implementing some simple energy saving measures, you could reduce your energy usage by up to 15%. And by saving energy, you'll save money and also help protect the environment.

We work closely with government agency the Energy Efficiency and Conservation Authority (EECA). Jointly, we've put together these simple and cost effective ways for you to save energy and money in your business.

$$ A permanently plumbed-in, well-insulated hot water boiler running cost is more cost effective than continually boiling a kettle.

Hot water

! Check the hot water temperature – older cylinder thermostats are not that accurate so you need to find the tap nearest to the cylinder and run it for at least 30 seconds before measuring the temperature. The temperature at the tap should be 55˚C (not less than 60˚C at the thermostat). If it isn't, then the thermostat needs adjusting. In most cases, you will need to get an electrician to do this. Re-check the temperature on the next day after changing the thermostat.

! Regularly inspect the water heat pressure relief valve to ensure there is no excessive water overflow.

$ Repair any dripping hot water taps – they waste water and energy.

$ Insulation – if your hot water cylinder is warm to touch, install a hot water cylinder wrap and fit lagging on pipes. Alternatively consider installing an 'A' grade hot water cylinder.

$ Choose a hot water system that best suits your business needs. And turn it off if your business is going to be closed for more than two weeks.

$ Reduce demand for hot water. If you have showers in the workplace, install water saving shower heads.

Insulation

$ Check all windows and doors to see if any draughts need to be sealed.

$ Automatic door closures – doors that open to the outside, for example, the main entrance, reception, car parks and delivery areas, let in a lot of cold air. Fitting automatic door closures will help reduce heating and air conditioning costs by reducing air movement between different areas.

$$ Refurbishing – this is the ideal time to examine ways of saving energy. A draught lobby prevents entrance ways and reception areas opening directly to the outside elements.

Heating and air conditioning

- Clear space – check heating and air conditioning equipment isn't obstructed by furniture or stock. This reduces energy efficiency, increases running costs and may also be unsafe.
- Portable heaters – avoid the use of portable heaters if your office is centrally heated. If they're needed in certain areas or at certain times, look at why and implement a system to control their use.
- Reduce heat loss – close windows and exterior doors when you're using air conditioning or heating to avoid unnecessary heat loss. Check seals on window and door frames, and block unused openings in walls or the roof.
- Turn off any unnecessary lighting to reduce the heat load.
- Heat the spaces that you are actually using, and shut doors and curtains to keep the heat in.
- Don't have the temperature higher than you need it – aim for between 18°C and 22°C while you are using a space.
- Ask your team not to adjust the settings (or lock your thermostat) and check the settings regularly – there is a large increase in energy consumption for each small increase in temperature.
- Stop simultaneous heating and cooling. Set air conditioning and heating controls so they don't conflict with each other.
- Sensors – avoid placing thermostats near heat sources such as photocopiers, vending machines, refrigerators, factory machinery, display lighting, sunlight and heaters. If an air conditioning sensor is over a heat source, the system will operate longer and use more energy than necessary.

$ Insulation – insulate your heating and air conditioning pipes and ducts against heat loss and gain. Add roof insulation if necessary.

$ High ceilings – rooms with high ceilings will have warmer temperatures at ceiling level than at floor level. Use a fan to push the air down. If possible, install false ceilings to reduce heating costs.

$ Time controls – use time controls for your office heating and air conditioning. For example, start air conditioning 30 minutes before staff arrive at work and stop it 30 minutes after they leave.

$ Mechanical ventilation and extraction fans can consume a lot of energy, so look for ways to reduce airflow rates. You could consider replacing existing fans with high efficiency fans. Check they are switched off when not required. Also check the correct operation of time clocks, and their timer settings.

$ Clean and replace air filters regularly.

$ Install shades and awnings to prevent overheating and glare from sunlight.

$ Arrange regular maintenance checks of your air conditioning system.

$$ Heat recovery options – heat wasted through ventilation, catering, cleaning or industrial processes can sometimes be reused to lower energy usage. There is a wide variety of methods available to recover heat waste – seek professional advice to assess the viability of any system.

$$ Use a combined thermostat/timer/occupancy sensor to control heating and air conditioning in areas that aren't used often, such as meeting or conference rooms.

! Lighting systems can use up to 50% of the energy in office buildings.

Lighting

- ! Check that full lighting is not being used unnecessarily outside normal business hours.
- ! Regularly clean lights and light fittings. Dirt and dust can reduce light output significantly.
- ! Display lighting is energy intensive and is often over used. Ensure it's switched off when it's not required, or install a timer or motion sensor. For example, consider shop fronts that are illuminated only when triggered by passers-by.
- $ Install motion sensors on your outside lights and in areas that aren't used all the time, such as meeting rooms, bathrooms and storage rooms.
- $ Light tubes – where possible, replace tungsten, halogen and incandescent lamps with more efficient options such as linear and compact fluorescent lamps (CFL). They use up to 80% less electricity and can last up to 10 times longer.
- $ Switching – break up large areas of lights that are on a single switch into separately controlled areas, particularly areas near windows and partitioned-off rooms. This enables lights to be switched off when they're not needed.
- $ Replace lights before they lose their effectiveness. The light output of a fluorescent light tube decreases near the end of its life, but it still uses the same amount of energy.
- $ Fluorescent lighting – replace all 36 watt and 58 watt fluorescent light fittings with newly available 32 watt and 51 watt high efficiency tubes. It pays to get a professional lighting consultant to check your lighting requirements.
- $ Have lighting levels measured to check whether any areas are overlit. In rooms that receive a lot of natural light, consider using light sensitive sensors to cut down on artificial lighting.
- $ External and security lighting – outside lighting should be controlled by a timer to automatically turn lights on at dusk and off at dawn. Use low energy light bulbs.

! No cost $ Low cost $$ Some investment

$$ Old fridges are inefficient fridges – they waste a lot of energy and money, and they're not good for the environment.

Appliances

! Encourage staff to use the microwave rather than the stovetop or oven.

! Make sure oven, fridge and freezer seals are kept clean, are properly fitted and are replaced when they're not working properly.

! Ensure there's adequate ventilation at the top and back of refrigeration equipment – check the manufacturer's specifications on minimum clearance.

! Set the fridge temperature to between 2°C and 4°C, and the freezer to -18°C.

! Defrost the fridge/freezer at least twice a year to keep it running efficiently. If it frosts up quickly, check the door seal.

! Avoid placing your fridge or freezer next to your oven or in direct sunlight.

! Wait until the dishwasher is full before turning it on.

! Always use the economy cycle on your dishwasher – if your dishwasher's able to heat its own water, use this function – it's more economical than drawing water from the hot water cylinder. Try and fill the dishwasher to its maximum – small washes are an inefficient use of electricity and water.

Food preparation

! Encourage staff to defrost food naturally instead of using the microwave.

! Keep food covered to reduce moisture build-up on the inside of the fridge. And make sure containers and bottles are moisture free before placing them in the fridge.

! You can save up to $100 per year if your computer is turned off overnight and during the weekends.

Computers and office equipment

! Switch it off – the quickest and easiest way to save energy is to apply the simple rule 'if it doesn't need to be on, switch it off'. Encourage staff to be proactive in turning off electronic equipment.

! Unplug mobile phone chargers when you're not using them.

Computers

! Switch off monitors when you're not using them.

! Check whether your IT equipment has any energy saving modes that can be enabled. For example, if enabled, most new PC monitors will power down when the computer's not in use.

Uninterruptible Power Supply (UPS)

! UPS is designed to maintain constant power to equipment if the electricity fails. If you have UPS installed, check that it's sized accurately, as excess capacity will increase running costs.

If you are replacing appliances in your business, purchase the most efficient appliances you can: Look for ENERGY STAR® – the global mark of energy efficiency. Only the best products that use the least energy can carry the ENERGY STAR® rating.

The yellow and red star rating label tells you how much energy an appliance will consume. For a quick estimate of the annual running costs for new appliances, cover the last digit of the 'energy consumption' number on the 'star rating' label, double it, and turn the remaining figure into dollars.

And remember to ask your appliance retailer to take away your old appliance – many are recyclable, which is not only safer but better for the environment.

! **No cost** $ **Low cost** $$ **Some investment**

! Insulation provides heating and cooling with no ongoing operating costs.

The industrial energy savings process

Many different electrical processes are used in modern industry, including heating by:

- direct and indirect resistance
- short, medium, and long-wave infra-red radiation
- induction processes
- dielectric, microwave, and ultra-violet means.

It's a good idea to get expert advice about energy efficiency for your business

You could recover the cost to upgrade or install new, more energy efficient equipment through:

- reduced operating costs
- increased productivity
- better quality products
- fewer rejected end-products
- lower energy costs.

Look at the overall cost effectiveness of each scheme carefully before you install new equipment. Further savings can be achieved with the equipment you already have, often at a low cost, by fitting devices such as timers, thermostats and photo-electric cells. These save electricity by making sure equipment is used only when you need it, or by accurately controlling temperatures.

Set appropriate operating temperatures for part load operations to avoid long 'soak' or overheating. This action can save up to 10% of current energy use.

Motors

Saving energy using motor power needs to be done carefully to ensure that the actions taken will result in real energy savings, especially when changing an electric motor. Make sure the motor is the correct rating and duty for the task, and consider the following:

! Install timers, level sensors, material sensors or other controls for automatic operation and/or to shut off equipment as required.

! Replace oversized motors with properly sized energy efficient motors. Motors consume the least amount of energy when they operate at their highest efficiency.

! Replace throttle controls with a solid-state variable system drive control and fan discharges with inlet vane controls.

$$ High efficiency motors

When choosing new motors, select high efficiency models. Any additional purchase price is rapidly paid back through energy savings. Ensure a professional engineer helps you optimise your motor drive systems.

! Ventilation

Keep the motor clean and ensure airflow is free of rubbish or stored material.

! Filters

Clean any filters on the motor or driver equipment regularly, especially in food production or spray shop establishments.

$ Drive type

It may be possible to change the method of drive to reduce energy usage. Altering gear ratios and the type of lubrication used may also be beneficial.

$ Regular maintenance

Check belts and chain tensions regularly, as well as the motor itself.

! **Phase balancing**

Motor efficiency can be impaired if one phase of the supply suffers a voltage drop due to a badly balanced load.

$ **Reduce motor loads**

Reducing the distance between the motor and the application can reduce load. Increasing duct sizes or pipe diameters and reducing the number of bends and restrictions will also affect motor loads, reducing them and power usage.

$$ The bulk of savings available from motor drives is achieved by better matching the drive to the load (usually by using a variable speed drive) and by improving the efficiency of the driven load. The annual electricity cost for running an electric motor can be up to 10 times more than the cost of the motor.

$ **Reduce motor idle time**

Determine any processes that have motors running but not producing product for any length of time. As well as using electricity this has the effect of running plant unnecessarily and using up the life of the equipment, bearings, conveyor rollers etc, resulting in earlier maintenance periods for overhauls, and repairs.

A plant walk-through after production hours can also determine if motors are left running.

! No cost $ Low cost $$ Some investment

! Set energy targets for your staff and, using the meter reading information, post progress charts in staff rooms to show them that their efforts are making a real difference. Tell them how much these savings mean in financial terms. Consider offering them an incentive for helping to improve efficiency.

It's important to manage your energy usage effectively. Identify your business's peak time and higher charge periods. Then adjust your energy usage accordingly, or implement measures to control it.

Regular meter checks

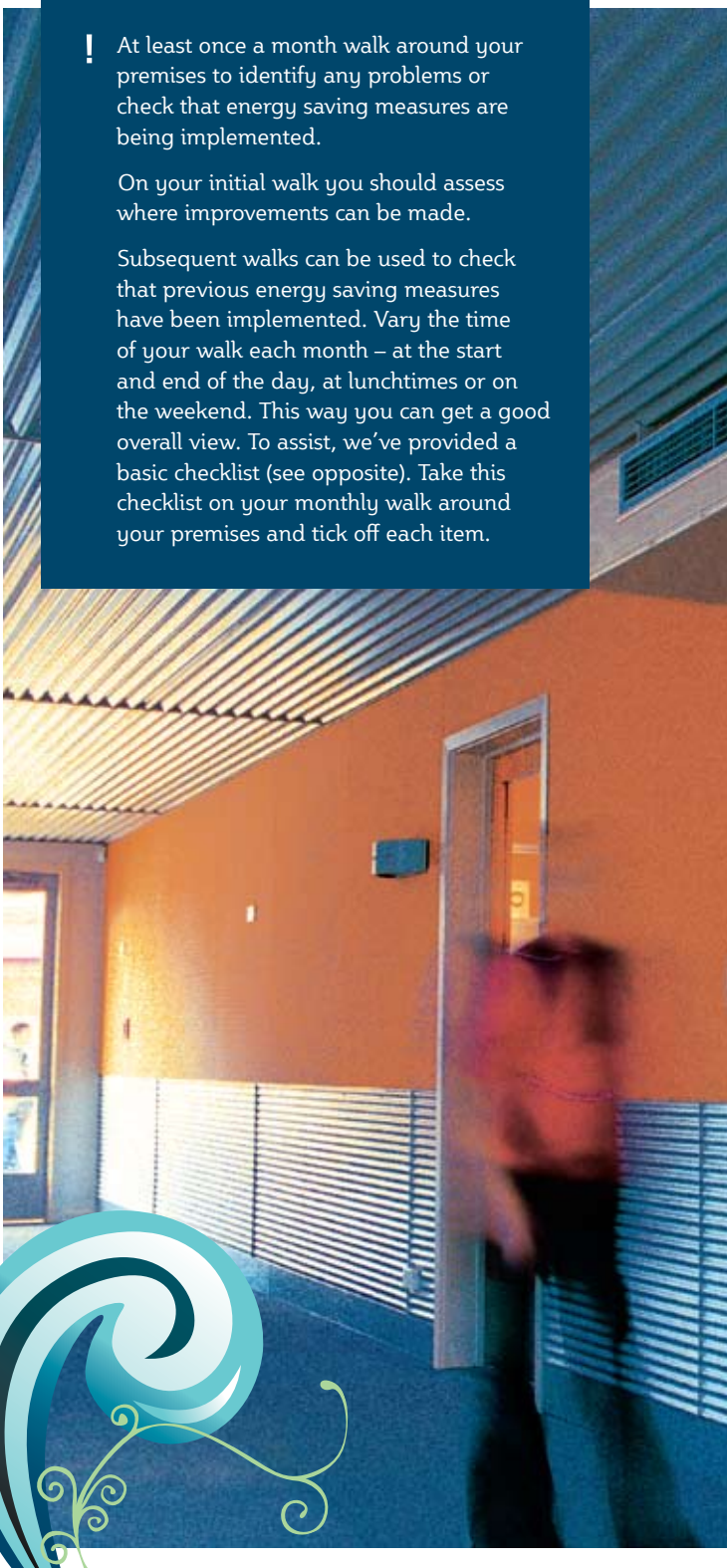
While Meridian reads your meter regularly, we also suggest you carry out your own regular meter readings. Keep records in graphic or visual form, so you can easily see any differences in energy usage. If usage levels suddenly increase for no apparent reason, you should investigate immediately. It may be something as simple as a timer having been overridden. If your only source of data is your bill (which may be estimated), energy wastage could go undetected for longer than necessary.

Monitoring staff comments

Monitor all staff comments about comfort levels relating to heating, air conditioning and hot water. If the number of incidents increases, investigate further. There may be a fault or the system may need to be replaced.

Staff energy awareness campaigns

Run energy awareness campaigns to encourage your staff to switch off equipment or lights when not in use. And make them aware, through team meetings and training, of any other energy saving measures you decide to implement. Listen to any suggestions or comments: they may raise issues you hadn't considered.



! At least once a month walk around your premises to identify any problems or check that energy saving measures are being implemented.

On your initial walk you should assess where improvements can be made.

Subsequent walks can be used to check that previous energy saving measures have been implemented. Vary the time of your walk each month – at the start and end of the day, at lunchtimes or on the weekend. This way you can get a good overall view. To assist, we've provided a basic checklist (see opposite). Take this checklist on your monthly walk around your premises and tick off each item.

Energy walk checklist

Lighting	Tick
1. Lighting is turned off in rooms or areas not in use – or reduced in rooms not fully used.	
2. Wherever possible, natural light is being used to its full potential. For example, can blinds or other window coverings be pulled clear of the windows to allow maximum natural light?	
Heating and air conditioning	
1. Windows and doors are closed while heating or air conditioning is on.	
2. No portable heating or cooling equipment is in use.	
3. Heating and air conditioning controls are set correctly.	
4. Temperature settings are correct in different parts of the building at different times of the day.	
5. Timers are set correctly and have not been overridden.	
6. Heating and air conditioning equipment, vents and grills are clear and unobstructed at all times.	
7. Any mechanical ventilation that's supposed to be off is switched off.	
Miscellaneous	
1. No dripping water taps (e.g. hot water taps).	
2. No equipment has been left on unnecessarily.	
3. Draught proofing of windows and door frames: is there any, is it adequate, does it need replacing?	
Specific to your business	
1.	
2.	
3.	
4.	
5.	
6.	
7.	
8.	

Your overview for saving energy and money

General

- Rationalise excess equipment.
- Turn off unused hot water cylinders.
- Ensure windows are kept closed when heating and air conditioning systems are operating.
- Repair leaks – water, steam, compressed air.
- Reduce hot water cylinder thermostat to 60°C, or 55°C at tap.
- Fit cylinder wraps to hot water cylinders.
- Install a water saving shower head to reduce flow.
- Insulate hot water pipes and valves.
- Control water heating to run only when required.
- Isolate unused areas.
- Install urinal water saving controls.
- Fit automatic door closers to air conditioned areas.
- Improve window shading.
- Insulate to NZS 4243 where necessary.

Lighting

- Remove light bulbs from room fittings, to reduce light levels in areas that are overlit.
- Replace 38mm fluorescent light tubes with new higher efficiency tubes.
- Label light switch circuits so staff can turn off lights not needed in their area.
- Group relighting of fluorescent fixtures and overlit areas as follows:
  - Measure light levels and compare with appropriate standard.
  - Clean fittings – replace discoloured and silverguard diffusers with prismatic diffusers.
  - Bulk relamp with new higher efficiency tubes to obtain required levels and quality.
- Replace tungsten, halogen and incandescent tubes with more efficient options.
- Install additional light switches to suit occupancy and usage.
- Replace aged light fittings and install occupancy sensors to control lighting.
- Retro-fit light fittings with specular reflectors.
- Upgrade ballasts in fluorescent light fittings.
- Upgrade diffusers on light fittings.

Management

- Identify peak time periods and control energy usage.
- Manage cleaners' energy use or schedule.
- Run staff awareness campaigns:
  - 'Switch off' office equipment when not in use.
  - 'Switch off' lights when not in use.
- Purchase and operate ENERGY STAR® office equipment.
- Monitor and target energy use and costs.
- Manage meter and/or transformer capacity cost.
- Improve power factor.
- Develop organisational energy policy and standards.
- Install an electrical demand management system to reduce peak usage.

Heating and air conditioning

- Review/renegotiate service contracts.
- Stop simultaneous heating and cooling.
- Adjust temperature setpoint.
- 'Switch off' unnecessary plant.
- Reset HVAC setpoints and timers.
- Adjust controls to minimise the use of air handlers and other HVAC equipment.
- Programme automatic temperature resets into controls.
- Improve staging of multiple boilers and chillers.
- Look for and deal with leaks in building and pipes etc.
- Recommission HVAC systems.
- Reduce excess ventilation air.
- Improve maintenance of degraded plant.
- Install time switches to limit run time.
- Upgrade HVAC controls.
- Install optimiser to automatically optimise boiler start and stop times.
- Install compensators to automatically adjust heating systems in accordance with outside weather conditions.
- Install destratification fans where appropriate.
- Improve boiler maintenance.
- Install electronic thermostats.
- Upgrade HVAC equipment.
- Replace fans with high efficiency fans.
- Fit economisers so fresh air is used for cooling.

Remember: if it doesn't need to be on – switch it off!

WE ARE HERE TO HELP

Meridian is committed to helping your business save energy and money. If you'd like to receive more information about energy savings for your business, please contact our dedicated Business Team.

Phone **0800 496 777**
Fax **0800 497 498**

Monday to Friday, excluding public holidays, between 7.30am and 7.30pm

Email **business@meridianenergy.co.nz**
Website **www.meridian.co.nz**

EECA

The Energy Efficiency and Conservation Authority (EECA) offers information, advice and, in some cases, funding, to help businesses become more energy efficient and save money. For information on how EECA can help your business save money, phone **0800 358 676**, email **info@eeca.govt.nz** or visit **www.eecabusiness.govt.nz**

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