Spark fact sheets

Heating and cooling

Heating and cooling services (known as HVAC, which stands for 'heating, ventilation and air conditioning') typically account for around 70% of energy use in commercial buildings. And this energy is mostly used during peak times, which means you are paying the highest price – or tariff – charged by your electricity provider.

But the good news is you can do many things around your workplace to reduce HVAC demand and lower your electricity bills.

The thermostat is your friend

Rule one: don't over-cool or over-heat. A difference of just one degree can reduce energy consumption and your energy footprint by up to 10%. Recommended temperatures for optimal energy savings (without compromising comfort) are 24 to 25°C in summer and

18 to 20°C in winter – so keep an eye on the thermostat in your office to make sure the main space stays within these temperatures.

Air movement also affects the comfort of a room so if you have fans, use them. The use of fans will reduce the need for air conditioning which means you may be able to set the thermostat to 27 to 28°C in summer without compromising comfort levels.

Ensure the thermostat is set – and not tampered with or adjusted by your staff – this is a sensible cost saving measure.

Place the thermostat well away from draughts. Program your system to start 30 minutes to one hour before opening and to switch off 30 minutes to one hour before closing – this reduces the chance that someone may forget to switch it off before they go home and can save up to 30% on energy costs. Program it to be off when the building is not occupied, for example overnight or on weekends and public holidays.

Ensure the vents and thermostats in unused areas are switched off.

At a Spark pilot site in South Castlemaine, Victoria, the kindergarten reduced its energy usage by nearly half simply be reducing the amount of heating used.

The South Castlemaine kindergarten achieved this result without any noticeable change to the thermal comfort felt by the children and staff.

Reducing appliance heat load

Heat is also created by appliances, such as computers and urns. So make sure appliances that are not in use are switched off. Plug-in heating and cooling devices, such as bar heaters, will also affect the HVAC system and should not be used during HVAC operation.

At one Spark pilot site in Queenscliff, a large heated urn ran 24/7 through the year in a dining room. These cups of tea cost the site $5400 a year, or almost a third of the camp's electricity bills. Putting the urn on a timer, so it switches off at night, was the most effective single change the camp staff could make to save energy.

Keeping heat out (and in!)

During summer, keep doors and windows closed wherever possible. Open doors or windows can increase heating and cooling costs by up to 50%. In hot weather, pull down blinds and shades wherever possible, to lower heating loads on the air conditioner. In winter keep the shades up, allowing the sun to warm the building – but close the shades again at night to prevent heat loss.

Make sure all heating and cooling outlets are clear of obstructions like furniture and partitions. If you have the cash, replacing your air conditioner with a new, more efficient system will save you will save you around 10% on running cost per every extra star on the energy rating label.

After-hours HVAC use

Staff working after hours should use task lighting (lamps) and, rather than employ building-wide HVAC systems, use supplementary heating and cooling devices.

Explaining to staff how the HVAC system works is essential. Make sure all staff know how to use the HVAC system and have ready access to a building manual.

A sign beside on/off switches and remote controls will help prompt energy saving behaviour.

Implementing a best-practice maintenance program focussing on water and energy efficiency can deliver savings on utility bills of up to 40%. Maintenance of heating and cooling systems is essential. It stands to reason, if the equipment is in good condition, it will behave at its most energy efficient. Regular servicing will also maximise the life span of the equipment and its efficacy. Make sure your system gets the maintenance it needs, with all fans, filters and air ducts cleaned quarterly and regular tuning of equipment and sensors.

When it's time to upgrade the system, make sure you get the best advice. It will save you money, time and energy – for the benefit of yourself, your workplace, and your community.

Tips

Lighting

In a typical business, lighting can contribute up to 50% of all energy used. This means that, depending on your business, lighting efficiencies can reduce your costs substantially.

Most buildings would be well lit using only a fraction of the lights currently installed. Ensuring that you use only the lights you really need can lead to huge savings on your electricity bills… and for the environment.

Switch it off

There is plenty you can do around the workplace to save energy by using lighting wisely.

Keep an eye out for outside lights being left on and opportunities to 'delamp' – taking out excess bulbs in areas where you don't need as much light, such as hallways and walkways.

In the conference room at one Spark pilot site in Victoria, it was discovered the room had thirty-six lights, more than necessary. YMCA staff made an immediate saving by removing one globe from every light bank in the conference room, with no discernible change to the amount of light needed to make life comfortable in the facility.

You can use a lux meter (see boxed text) to ensure that the levels of lighting you have are appropriate.

Maintenance

Make sure that you keep an eye on your bulbs' light output and replace them as necessary. You should also clean bulbs and fittings on a regular basis – dust and dirt can also reduce light output.

Task lighting

Focused task lighting (e.g. using desk lamps) is an excellent energy efficient option because it allows you to provide the high level of lighting you need for tasks and activities without having to supply that same level throughout the whole building or room. It can halve lighting energy requirements. Task lighting also allows staff to control the direction and location of their lighting to suit their needs.

Use natural light

Consider relocating workstations, tasks or activities to where there is ample natural light – it's free, and is good for the soul. Light coloured and reflective surfaces can also improve the natural light in a space. In sun-lit parts of the building or room where glare is a problem, you may need to install glazed or reflective-film glass windows and shading so that staff can keep blinds up to allow in natural light. Remember too, that direct penetration of sunlight into the building on hot days creates a big heat load for the heating and cooling system, so try to balance the need for natural light against the need to keep the building cool in summer.

For the future

It's a good idea to upgrade to high-efficiency lighting as many upgrades pay for themselves in 2-3 years and sometimes less. Many efficient lighting technologies exist, including modern fluorescent lamps and LED lighting, so it may be worth discussing your lighting options with a lighting specialist or reputable supplier. Avoid using halogen lights, even if they are low voltage lights, and especially avoid halogen downlights, as these give out a lot of heat and are not an efficient lighting technology.

At one stadium in Geelong, the YMCA will save up to $4,200 from its electricity bills annually by installing LED lights. The upgrade – a replacement of its mercury vapour lights with LED technology - will more than pay for itself within three years.

It is also wise to consider installing light sensors in low occupancy rooms such as bathrooms, storage spaces and staff rooms.

On a smaller scale, it is a good idea to install individual light switches to rooms and to arrange lighting circuits according to their location and function - e.g. daylit areas, hallways, areas with lower occupancy rates and daytime only activity areas – in order to reduce energy use.

What is a lux meter… and why should we use one?

At work… or even home.

A lux meter is a device which enables you to measure the amount of light in a room. Workplace lighting guidelines set out by Safe Work Australia state that an ideal light reading for a general office or classroom situation would be around 320 lux. A situation requiring extra lighting for fine detailed work might take up to 600 lux.7 Areas such as bathrooms, eating areas and hallways, or areas with extra light sources like computer screens, do not need more than 240 lux.

How to use a lux meter

There are many free, basic lux meter apps for smartphones. You can buy a more advanced lux meter from most electrical or camera stores for around $30.

1.   Hold the lux meter away from your body at the head height at which most activities in the room would take place. For instance, roughly half a metre above desk level in an office. Keep it clear of other surfaces.

2.   Switch on the lux meter and wait for the reading to stabilise.

3.   Note the reading and repeat twice more in different areas of the room.

4.   Add together the numbers from three readings and divide by three to obtain an average light reading for the room.

Many people who use a lux meter in their office or classroom discover that their environment is over-lit.

That represents extra energy, which you are paying for and we can save if we prioritise becoming energy efficient.

Energy saving tips

Chill out about refrigeration

Refrigeration can be a significant part of electricity costs but it's often overlooked in the search for savings. You don't necessarily need a new, high-efficiency fridge to cut your energy bills and become more energy efficient. There are lots of adjustments you can make to your existing fridge to save energy.

Stock up

Try to keep refrigerators at least 60 - 75% full. A full refrigerator has a smaller volume of cold air in it. When the door is opened the cold air rushes out and is replaced by warm air – which needs to be cooled down, which uses electricity. A well-stocked refrigerator is a cheaper refrigerator. You can keep your refrigerator full by stocking the shelves with bottles of water or other drinks.

Also remember that one full refrigerator is more efficient than two half-full ones, so if you have a second refrigerator that is mostly empty, stop using it.

Keep it cool

Fridges have to work harder when the room is warm. Keep fridges and freezers away from direct sunlight or heat – or any device which produces heat, like an oven. Make sure that there is good air flow around the fridge - at least 80mm between the back of the fridge and the wall – as this will stop heat from building up around the fridge.

If you can see external condenser coils behind your fridge, consider cleaning the dust and dirt off them two or three times a year. Dust on the condensers can act as an insulator and hinder the heat-transfer process.

Remove any objects blocking air flow around the fridge, open the fridge door as little as possible and, finally, never put hot food into the fridge – let it cool down first.

Fresh food compartments should be set to around 4°C and freezers should be set at around -18°C.7 It's worth investing in a fridge thermometer as this will allow you to monitor the temperature of your fridge accurately to ensure you are not over-chilling.

Maintenance

Regularly check door seals, hinges and repair them if necessary so that the fridge doors fully close. Keep an ear out for strange sounds, which may indicate a problem.

Keep an eye on the condenser coils - keep them clean and avoid any ice building up on them.

Make sure the fridge is level on the ground to help ensure the doors remain tightly sealed.

For the future

When upgrading your fridge, remember that while a high star-rating model may be more expensive, it will help pay for itself with years of lower energy costs. Try to invest in a model with alarmed or self-closing doors, so that forgetful friends don't cost you energy by leaving the door ajar.

DO:

•   Provide sufficient ventilation

•   Keep fridge well stocked

•   Replace worn or damaged door seals

At one Spark pilot site in Bendigo, Victoria it was discovered that a big expense in terms of energy was in the kiosk area of a pool facility. Seven fridges/freezers and a salad bar are kept running 24 hours a day. This could be consolidated by amalgamating one or two of the fridges, and fridges for non-perishable drinks could be turned off overnight with a timer.

A full refrigerator will save electricity, by reducing the exchange of warm and cold air.

Energy saving tips

Get yourself out of hot water

Heating water is a big energy expense. This is especially so where electric hot water systems are involved. There are many types of hot water system. Heating water can account for a quarter of the household electricity bill.

There are three ways to reduce hot water expenses: use less, improve the efficiency of your existing system, or invest in a new, more energy-efficient system. Let's look at the first two options.

Use less hot water

Do you automatically turn on the hot water tap to do something which could be done just as well with cold water? Try to use cold water wherever possible. For example when filling up the kettle, washing your hands or doing a load of laundry.

If you have a small number of staff, choose a kettle rather than an urn and only fill it to the level you need.

Dishwashers should be turned on only when there's a full load. Use the eco-load wherever possible. If you have a washing machine, use cold water and invest in a front loader when it's time to buy a new model – they are far more water and energy-efficient than top loaders. It will save you money.

Other cost-effective energy efficiency measures include installing water efficient taps or flow control valves, and low-flow shower heads. These will save water and the energy required to heat the water. You could also upgrade to sensor taps, which ensure water is turned off when it should be.

Maintenance

Keep an eye out for leaks and ensure they are fixed promptly. Dripping taps can waste as much as 20,000 litres a year – if it's a hot water tap, that's a lot of wasted energy – and money.

Get out of hot water…

All hot water systems come with a thermostat with a variable temperature set point and most are set at an unnecessarily high level. By reducing the water temperature by as little as 5°C, you can reduce energy consumption by between 3% and 5%. (Just don't set the thermostat lower than 60°C as this could permit the growth of pathogens in the storage tank.)

Ensure all hot water pipes, the storage tank and fittings of your electric storage hot water system are insulated, and wrapped in something heat resistant, to minimise heat loss (do not insulate a gas or non-storage electric hot water system). If you can safely get to them, insulate the hot water pipes feeding the water in, and out, of the tank.

Insulating your hot water pipes reduces heat loss and will save more on your water heating bills.

Know when to turn the water heater off. Turning off the hot water systems prevents unnecessary water heating. You might want to install a push button or timer to automatically turn the system on and off.

Ensure all hot water systems receive a regular service, to fix faulty valves and leaks. Other technology exists – specifically using heat pumps to heat your water.

If it is time to upgrade your electric hot water system, consider all options. Solar is the most efficient in terms of the kind of energy used to heat the water, but upgrading to a heat pump, or natural gas powered hot water system are also ways to make your hot water generation more energy efficient. Have a look at all the options available and make an informed decision about what hot water system is best for your Centre.

Spark fact

At one Spark pilot site, it was discovered that the continuous use of one large heated urn cost the site $5,400 a year, or almost a third of the site's electricity bills. Putting the urn on a timer, so it switches off at night, would be the most effective single change the staff could make to save energy.

Energy saving tips

Household appliances account for a third of our electricity bill

Standby power

Across Australia, leaving electrical equipment on 'standby', on average, accounts for as much as 10% of an Australian household power bill.

Standby is a low power mode for an electrical device, which aims to significantly reduce its power consumption, when it is not in full use. However, it means the device is not completely switched off. This means the device is still consuming some power.

Federal Government figures tell us that Australians are spending nearly a billion dollars a year on standby power. It is, simply, a waste of time and energy.

When you turn appliances off with the remote, rather than at the wall, the appliance will go to standby power.

If an appliance has a clock, a display, a small light that stays illuminated when not operating then it is on standby. In which case, these electrical appliances need to be switched off at the wall when not in use, to avoid using power. For example, 80% of the energy use during the life of a microwave, is standby power used to run its clock.

Standby power is the electricity consumed by an appliance when it's not being used. Around 10% of Australian household electricity is wasted on standby power.

Minimise appliance use

Personal heaters and portable air conditioners should not be used except outside of a building's HVAC ('heating, ventilation and air conditioning') operating hours, as they significantly increase energy consumption and affect the operation of base building HVAC systems.

Computers & IT

It is estimated that two thirds of the energy used by office equipment is used during 'idling' time, when the equipment isn't being used or performing any actual function. Which means there are a lot of computers, printers and photocopiers sitting there doing nothing but using

energy and consuming power. We pay for this power, but it is not actually resulting in any output or function for our work or family lives.

So ensure all computers are put into sleep mode when not in use and are fully shut down at the end of the day – or you are paying for something which is doing NOTHING for you. You should also turn off your monitor at lunch breaks or during extended periods of non-use. Avoid screen savers – they don't save energy, they use it.

When you've finished using your computer for the day, try switching it off at the wall. An easy way to do this is to use power boards with individual switches for each appliance.

Other appliances

Phone chargers and other power packs do draw power even when the appliance isn't attached so switch it off – at source.

Photocopiers and printers are the two largest users of energy per unit in the office but can be standing idling for much of the day. Turn them off when not in use and especially overnight and over weekends. Shutting off these appliances should not cause any damage to servers or to the equipment.

By using a simple energy meter you can find out how much power any appliance is using when it is switched on. One Spark pilot site did just this, and this is what a staff member reported back:

Spark fact

At one Spark pilot site in Bendigo, a childcare centre has reduced its overnight idling power usage by 75%, from 4 kW to 1 kW per hour. Appliances left on idle overnight (and weekends) add up… saving that energy by switching these appliances off at the wall translates into a saving of $88 a week, or $4600 a year.