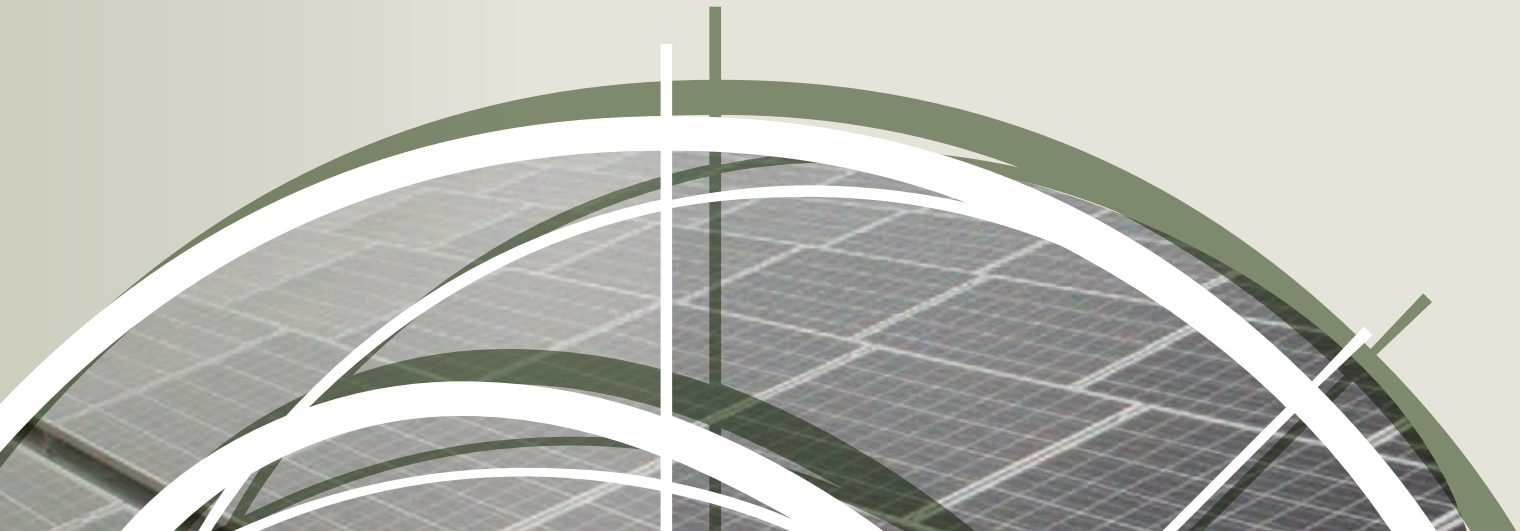
Catchment Management Authority
Central West

Resource Efficiency Toolkit

FOR MEDIUM TO SMALL BUSINESS

This Toolkit is designed to assist your business in becoming more sustainable while also implementing simple cost saving measures.

Contents



Resource Efficiency Toolkit

introduction

This Resource Efficiency Toolkit, for small to medium businesses has been developed to assist in assessing how your business might implement some simple cost savings while making a move to becoming more sustainable.

The toolkit is divided into two sections. The first is the Case Studies that give examples of businesses that were audited in Bathurst, Orange and Dubbo, which include a description of the changes and savings made by these businesses as a result of the audits.

The audits undertaken examined business activities around the areas of:

- Energy
- Water and
- Waste

The second section is the Toolkit. It provides background information and some simple checklists that can assist you to get started and implement some simple cost-effective changes to your business operations.

The original audits were made possible by funding through the Central West Catchment Management Authority (CMA) which supported the Bathurst–Orange–Dubbo Alliance to facilitate audits of small and medium businesses in their towns.

The main focus of the audits in Orange and Dubbo was the Hospitality Industry, targeting larger businesses such as clubs and hotels. These businesses found they were able to make significant savings and operate more effectively using the knowledge gained through the audit process.

The audits were no less successful in Bathurst, but the range of businesses was far more diverse as businesses were identified through the local Business Chamber and through direct invitation.

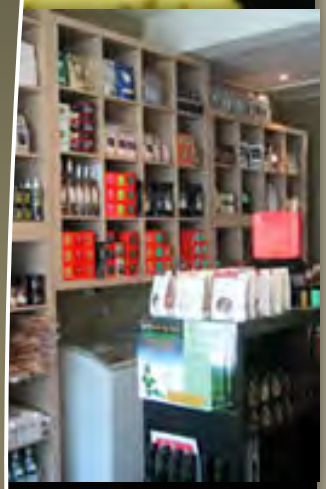
The experience of Bathurst-based consultants, CDE-Energy, was also sought in the development of this Toolkit. Consequently, although the case studies have a focus on Bathurst businesses, their experiences are similar to a great number of enterprises in the Central West.

The Central West CMA, which has long supported agriculture to become more sustainable, is proud to be associated with both the business water, energy and waste audits and this Toolkit, which seeks to support urban enterprises to identify more sustainable ways of doing business.

Not only can you achieve considerable saving, the changes you make in response to this Toolkit will help maintain *vibrant communities and healthy landscapes* across the catchment.

waste reduction

Café /Catering



Project description	Waste Reduction
Business Name	Al Dente Gourmet to Go
Project date	2011

ABOUT

Al Dente Gourmet is a Bathurst-based café and catering business.

Al Dente has an in-store café and deli which supplies local produce to customers. Al Dente also provides a corporate catering service. All of the businesses food preparation is undertaken on site.

The Al Dente café operates Monday to Friday from 6am to 4pm and on Saturday from 6am to 1pm.

Al Dente generates a large amount of organic waste, recyclable cardboard waste and general waste. Prior to implementation of waste reduction strategies all waste was being disposed through municipal collection, supplemented with approximately two extra trips to the local waste facility plus a skip bin with a weekly to fortnightly collection.

WASTE REDUCTION STRATEGY

Al Dente Gourmet has undertaken the following activities to reduce waste at the site:

- Recycling of all cardboard
- Daily collection of organic waste by a local egg producer

OUTCOME

As a result of these waste reduction strategies the site has reduced the quantity of waste requiring municipal disposal or skip collection by over 50%.

Waste Reduction activity	Saving resulting	Saving (per year)
Organic waste to local egg producer for poultry food	Reduced waste to skip bin and reduced trips to local waste facility	$343 PA
Cardboard Recycling	Reduced waste to skip bin and reduced trips to local waste facility	$2,000 PA

ADDITIONAL BENEFITS

Staff have an improved awareness of recycling and have also implemented energy and water efficiency strategies. These include adjusting temperature set points on the air conditioning system to 23°C in summer and 20°C in winter, turning off lighting when the premises is closed and upgrading some lamps, and installation of an aerator in the handwashing basin.

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Waste Reduction Action Plan

1. Conduct *Sustainability self-assessment (see Toolkit)*
2. Identify the business cost of waste collection by reviewing accounts:
   - Review council rates notices and water bills
   - Review private waste contractor invoices
3. Identify opportunities for waste sorting, minimisation or reuse, such as:
   - Purchasing more rubbish bins
   - Altering suppliers to minimise packaging
   - Investigate on site compaction or processing (i.e. Cardboard)
   - Reuse on site (i.e. Shredded paper for packaging)
   - Waste reuse by another or nearby business
4. Engage staff to establish waste sorting, minimisation or reuse on site
   - Document and communicate procedures
5. Contact council or waste contractor to reduce collection frequency and costs

Waste and cost change at Al Dente

Why reduce waste

- Reduced fuel use
- Reduced staff time for rubbish removal
- Reduced waste contractor collection fees

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energy efficiency & generation

Retail

Project description	• Lighting retrofit • Air conditioning upgrade • Solar panel installation • Time of use metering
Business name	Colemans Office Products
Project date	July 2011
Funding assistance	$3,787 from the Energy Efficiency for Small Business program (NSW Office of Environment & Heritage)

ABOUT

Colemans Office Products is located in Bathurst and is one of the largest and longest serving providers of a full range of office products in country NSW.

Colemans retails stationery, office furniture, copiers, printers, phones, point of sale systems, cash registers, as well as computers. They also provide office equipment maintenance and repair servicing.

In 2010, prior to the energy efficiency project implementation, Colemans was spending $11,434 per year on electricity costs (this would equate to $15,129 per year in 2012). 48% of energy was used for air conditioning, lighting comprised 24%, office equipment 25% and the remaining 3% on other items such as appliances in the staff kitchen.

ENERGY EFFICIENCY STRATEGY

An energy assessment identified energy saving actions which included:

- Upgrading fluorescent lighting with more efficient T5 lighting
- Installing a soft starter on the air conditioner compressor
- Upgrading electricity meter to Time Of Use

In February 2012 Colemans installed a 5 kW solar photovoltaic system comprising 24 panels at the premises.

OUTCOME

Following the air conditioning and lighting upgrades, new metering and installation of solar panels Colemans have reduced energy consumption by 31% and cost by $4,724 (at 2012 electricity prices). The summer period experienced the best savings of 42% which is expected to be a combination of more efficient air conditioning system operation and high solar panel output.

Project Item	Cost	Funding assistance	Payback period (yrs)
Energy efficiency upgrades	$7,574	$3,787	2.3
Metering upgrade	$110	$ 0	0.2
Solar Panels	$12,000	60c/kWh generated	4.5

ADDITIONAL BENEFITS

Improved staff awareness of energy efficiency.

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Action Plan

1. Conduct *Sustainability self-assessment (see Toolkit)*

2. Identify the business cost for electricity by reviewing energy bills

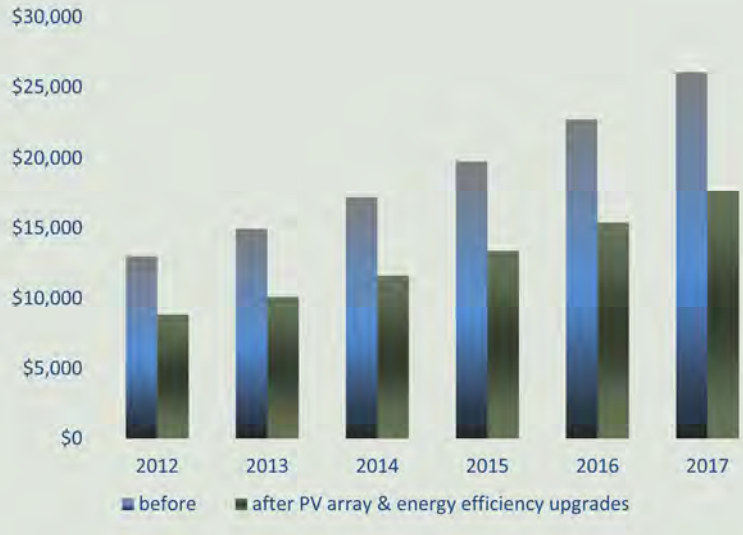
3. Consider when and how your organisation uses energy:
   - What proportion of energy is used at peak times (7am – 10pm Monday – Friday)
   - Could some consumption be moved to off peak times (i.e. Water heating)
   - See *Business and solar panels* fact sheet from Toolkit for more information about this as an option for your business

4. Identify opportunities for energy saving by engaging staff and identify implementation priorities

5. Establish a "Green Team" to implement energy saving actions:
   - Change lamps from incandescent to compact fluorescent
   - Implement daily equipment shutdown procedures
   - Establish an energy/maintenance log to record and action energy saving ideas and initiate equipment repairs

6. Consider engaging a specialist consultant to help identify other opportunities for energy saving

Energy cost change at Colemans



Why reduce electricity use

- Reduced cost
- Improved understanding of how business uses electricity
- Solar output profile matches business electricity use profile

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Retail

energy efficiency

Project description	Lighting
Business name	Bathurst Mowerland
Project date	2011
Funding assistance	$4,279 from the Energy Efficiency for Small Business program (NSW Office of Environment & Heritage)

ABOUT

Bathurst Mowerland stocks a large variety of leading brand lawn mowers, power equipment, heating products and tractors.

As well as stocking new products, Bathurst Mowerland also supplies used equipment and provides a service and repair department to their customers.

In 2011, Bathurst Mowerland Bathurst was spending $8,500 pa on electricity costs. 63% of electricity use was for lighting, 11% for air conditioning, 14% for office equipment and another 12% on other items including hot water and kitchen equipment.

To identify energy savings options Bathurst Mowerland engaged a consultant to identify energy saving opportunities.

ENERGY SAVING STRATEGY

The site energy assessment identified several lighting upgrade opportunities which were:

- Replace T8 fluorescent lighting with more efficient T5 fixtures
- Replace low voltage halogen lighting with LED downlights
- Replace high bay mercury vapour lighting with high bay fluorescent fixtures and LED spotlights (exterior)

OUTCOME

Bathurst Mowerland replaced all their lighting. Within six months of implementation the site had experienced an $800 quarterly reduction in electricity costs and projected annual savings of over $3200 and 37% of total site expenditure. A 61% saving on total lighting costs was achieved.

Project Item	Cost	Funding assistance	Payback period (yrs)
Replace low voltage halogen downlighting with LED fixtures	$3,644	$1,822	2.4
Replace fluorescent lamps with T5 adaptors	$1,584	$792	2.7
Replace high bay mercury vapour fixtures with LED fixtures	$3,330	$1,665	3.4

ADDITIONAL BENEFITS

The retrofit of the workshop lights has improved working conditions for staff.

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Action Plan

1. Conduct *Sustainability self-assessment (see Toolkit)*

2. Identify high bay lighting that could be upgraded

   High bay lighting upgrade opportunities include:
   - Mercury Vapour
   - Metal Halide
   - any lighting with a long restrike

3. Calculate potential savings:
   - How many hours per year does lighting operate?
   - How many hours could operation be reduced by if motion or light sensors were attached?
   - How many lamps are on the site?

   For each lamp, the estimated cost saving of upgrading to LED or fluorescent high bay fixtures is $95.20 per 100 hours of lamp operation (9.52c per lamp per hour)

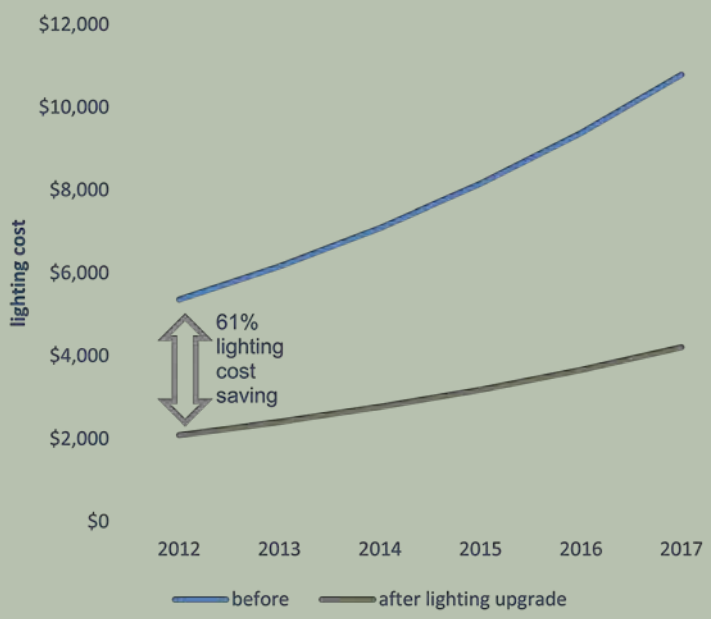
   Savings ($ pa) = no. lamps x annual operating hours x 0.0952

4. Source a quotation for upgrade from your electrician

5. Investigate the potential for your site to generate Energy Saving Certificates by going to the Energy Saving Scheme website at http://www.ess.nsw.gov.au

High bay Light

Lighting Costs at Bathurst Mowerland



Why Upgrade Lighting

- Longer lamp life
- Ability to switch off and restart lamps immediately
- Compatible with motion or light sensors
- Reduced cost

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Commercial

energy efficiency

Project description	Lighting
Business name	Russell Street Medical Centre
Project date	August 2011
Funding assistance	$1,905 from the Energy Efficiency for Small Business program (NSW Office of Environment & Heritage)

ABOUT

Russell Street Medical Centre is a general medical practice located in Bathurst. The Medical Centre has a group of eight doctors who provide medical care to the community.

In 2011 Russell Street Medical Centre was spending $14,100 pa on electricity costs. Site electricity consumption comprised 42% for air conditioning, 29% for office equipment, 20% for lighting, 5% for hot water and 4% for the staff kitchen.

ENERGY EFFICIENCY STRATEGY

An energy assessment of the site identified potential energy savings by:

- Installing new low voltage and fluorescent lighting
- Adjusting thermostat on air conditioner to 20 degrees C in winter and 24 degrees C in summer
- Turning off all office equipment overnight such as computers, printers and photocopiers.

OUTCOME

Russell Street Medical Centre implemented all changes and has achieved cost savings of $1,950 or 14% per year.

Project Item	Cost	Funding assistance	Payback period (yrs)
Replace T8 fluorescent lighting with T5 lamps	$3,040	$1,520 (50%)	3.6
Replace low voltage halogen downlights with LEDS	$800	$400 (50%)	5.0
Turning off equipment overnight	$0		immediate
Adjust air conditioning set points	$0		immediate

ADDITIONAL BENEFITS

Staff have been involved in energy efficiency changes and are actively not wasting energy.

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Action Plan

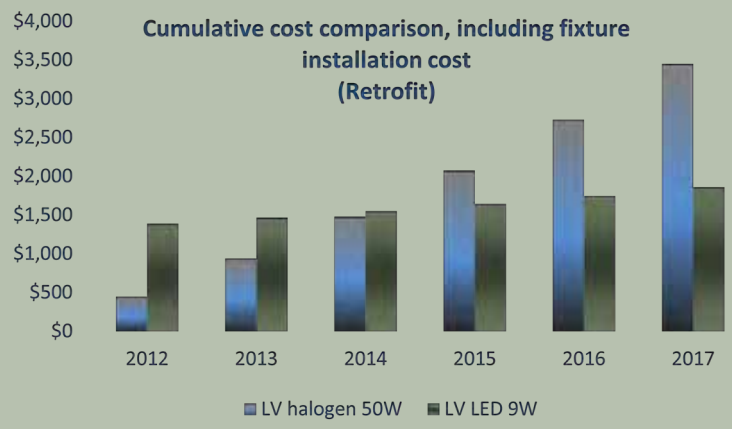
1. Conduct *Sustainability self-assessment (see Toolkit)*

2. Identify low voltage halogen lighting that could be upgraded

3. Calculate potential savings by identifying:
    - How many hours pa does lighting operate?
    - How many lamps are on the site?
    - How many lamps will replace existing lighting?
    - Replacement cost
    - Site electricity cost

4. Source quotes for replacement from electrician

Lighting Cost savings at Russell St Medical Centre



Why reduce Electricity Use

- Reduced cost
- Improved understanding of how business uses electricity

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water efficiency

Motel

Project description	Water saving initiatives
Business name	Templers Mill Motel
Project date	2010 / 2011
Funding assistance	Orange Council installed tap aerators and water efficient showerheads for free under a government scheme

ABOUT

The Templers Mill Motel is centrally located in Orange and is part of the Orange Ex-Services' Club complex. Guests can enjoy the convenience of the Club facilities while staying in one of 47 units.

Templers Mill Motel's many services include off street parking, complimentary laundry facilities and 24hr check in.

From 2009 to 2010 annual water bills at Templers Mill averaged $4,700 per year. Templers Mill Motel took a proactive approach to reduce water use and conducted a water audit at the site. The main areas of consumption were toilets, showers and hand basins.

WATER REDUCTION STRATEGY

As the motel rooms were fitted with dual flush toilets, the water reduction strategy included installation of water efficient shower heads and tap aerators. A staff education and awareness program was established to encourage identification and rectification of water wastage and water wise hints and tips are now displayed in motel rooms and washrooms for guests.

OUTCOME

Water consumption had reduced by 23% by 2011. The implementation of these initiatives has resulted in an annual cost saving of $900 or 16% per year.

Project Item	Cost	Funding assistance
Water efficient shower heads and tap aerators	$1500	100% from Orange Council
Printing of signage	$100	$0

ADDITIONAL BENIFITS

Less water used means less pressure on local waterways and water treatment facilities. Staff are more aware of water saving activities.

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Action Plan

1. Conduct *Sustainability self-assessment (see Toolkit)*
2. Identify water consumption and trade waste costs from council rates
3. Identify major water consuming activities in your business
4. Identify cost and environmental savings that could be achieved through water saving actions
5. Identify local council or other rebate/funding options that may be applicable to your site
6. Source quotes from plumber for implementation
7. Implement water saving actions

How to measure flow rate

- Find a container of about one or two litres volume. The container should be easy to fill with the tap on full flow and ideally transparent – like an old milk container.
- Place the container under the tap.
- Record the time it takes to fill the container to the top (or measured mark)

$$\text{Flow (L/min)} = \frac{\text{(container volume in litres)}}{\text{(fill time in seconds / 60)}}$$

Why Reduce Water Consumption

- Lower consumption costs
- Lower trade waste cost (which is often a percentage of consumption)
- More water for the local waterways

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waste reduction

Winery & Vineyard

Project description	Reuse of waste material to compost
Business Name	Vale Creek Winery
Project date	2010

ABOUT

Vale Creek Winery is located on the outskirts of Bathurst. The winery specialises in Italian varieties of wine. Grapes are grown in the vineyard and processed on site.

The winery holds regular weekend events featuring entertainment and food. The cellar door is open every Sunday for wine tastings.

Vale Creek sought opportunities to minimise waste disposal to landfill and improve production.

WASTE REDUCTION STRATEGY

Vale Creek Winery undertook the following activities to reduce waste to landfill:

- Vine prunings are left on the ground near vine trunks and mulched with flail mower. Gradually they break down and compost
- Spoiled lucerne hay, horse manure, sheep manure and other seasonal organic waste materials are composted on site. Almost all material is sourced from the farm and vineyard. The compost is utilised in the owner's garden.

OUTCOME

Landfill waste quantities have been reduced significantly resulting in lower waste disposal costs. Significant time savings have been achieved by eliminating the need to collect and dispose of vine prunings by burning. Compost provides soil improvement benefits that would otherwise require supplementation with purchased fertiliser.

Project	Cost	Other benefits
Composting	Some extra time	Reduced moisture loss
Mulching vine prunings	$0	Improved soil moisture retention

ADDITIONAL BENEFITS

Staff are now more aware of recycling and water saving benefits. Identification of waste savings has also led to the business undertaking an energy assessment and implementing energy efficiency strategies in 2012.

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Waste Resale Action Plan

1. Conduct *Sustainability self-assessment (see Toolkit)*

2. Identify potential opportunities for waste resale or reduction, such as:
   - Compost
   - Packaging (paper, cardboard or plastic)
   - Animal feed

3. Conduct economic assessment of opportunities. Identify cost of:
   - Processing
   - Packaging
   - Transport

4. Implement favourable projects

5. Contact council or waste contractor to reduce collection frequency and costs

Composting project economics		
Waste quantity	5000	kg
Processing time	25	hours
Total processing/bagging cost	**$875**	based on employment cost of $35/hr
Compost sale price	$5	per 20kg bag
Total retail value	**$1,250**	
Profit per bag	$1.5	
Total profit	***$375**	

* If considering sale of composted products, contact council with regard to local requirements.

Why reduce waste

- Generate an income stream
- Reduced fertiliser costs
- Reduced waste collection volume

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energy efficiency

Hair & Beauty

Project description	• Hot water system replacement • Insulation installation • Lighting upgrade
Business name	Zannes Hair & Beauty Centre
Project date	September 2011
Funding assistance	$1,993 from the Energy Efficiency for Small Business program (NSW Office of Environment & Heritage)

ABOUT

Zannes Hair and Beauty Centre is a salon located in Dubbo. The business operates six days a week.

In 2010 Zannes Hair and Beauty Centre identified that electricity was costing the business over $2,500 per year. 27% of electricity is used by service providing equipment, 20% on lighting, 19% for hot water, 16% for air conditioning and 18% on other equipment.

ENERGY REDUCTION STRATEGY

Zannes engaged an energy management consultant to assist identification of opportunities for energy cost reduction. The energy assessment report produced by the consultant identified the following energy saving opportunities by:

- Replacing fluorescent lighting with more efficient fixtures
- Replacing electric storage hot water system with an instantaneous gas hot water system
- Installing R3.5 insulation in the ceiling.

OUTCOME

Zannes Hair and Beauty has reviewed its electricity bills and found that its costs have reduced by $500 or 20%.

Project Item	Cost	Funding assistance	Payback period (yrs)
Hot water system replacement	$1990	$995 (50%)	7.3
Insulation installation	$1452	$726 (50%)	9.2
T8 fluorescent lighting upgrade	$544	$272 (50%)	4.1

ADDITIONAL BENEFITS

Staff have greater awareness of electricity consumption and cost and are more actively searching for opportunities to reduce electricity consumption further.

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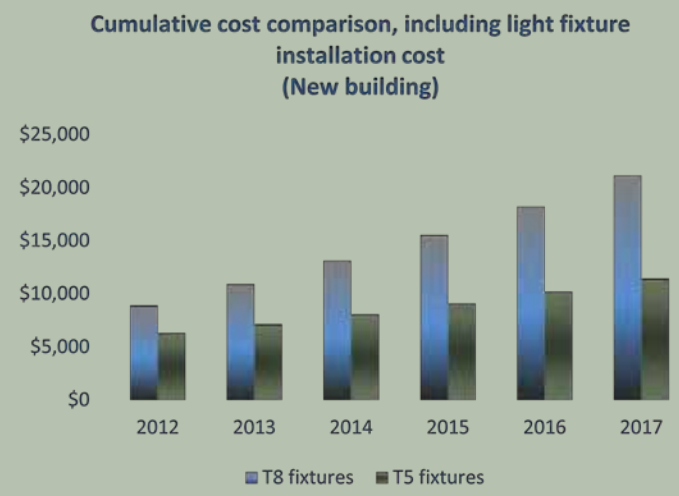
How to identify T8 lighting

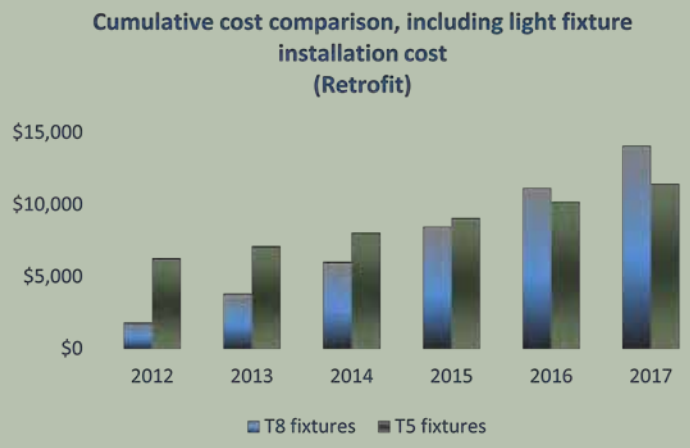
Features of T8 magnetic ballast lighting:

- Will flicker on start up
- May have an audible hum
- Lamp diameter is 1 inch/ 2.5cm (the 8 in T8 refers to 8/8 inch diameter)

Action Plan

1. Conduct *Sustainability self-assessment (see Toolkit)*
2. Identify fluorescent lighting that could be upgraded
3. Calculate potential savings by identifying:
   - How many hours pa does lighting operate?
   - How many lamps are on the site?
   - How many lamps will replace existing lighting?
   - Replacement cost
   - Site electricity cost
4. Source quotes for replacement from electrician





Indication of Comparative cost of T8 and T5 lighting solutions

	Light type	Quantity	Fixture costs	Installation cost (per fixture)	Total installation cost	Operating hours pa	Lamp power (W)	Fixture power (W)	Power per fixture (W)	Annual energy consumption (kWh pa)	Annual electricity cost
	T8	24	$95	$105	$7,080	2,756	2 x 36	20	92	6,085	$1,826
	T5	16	$120	$105	$5,520	2,756	2 x 28	2	58	2,558	$767

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Resource Efficiency Myths

Appliances like photocopiers should be left on overnight because the start up uses more power than when in standby.

No, this is not true. Leaving appliances on for periods of more than a few minutes uses more power than the start up process.

TIP *Connect a digital 7 day timer to appliances such as photocopiers and printers that are only required during working hours.*

Leaving on computers overnight improves the hard disk life.

This is true, **however** the cost of doing so can equate to over $200 pa in additional electricity costs. Improving the hard disk life from nine to ten years by leaving the computer on all the time is a waste of energy particularly when many computers are replaced well before the hard disk fails.

TIP *Turn off computers at the end of each day and configure settings to shut down the hard disk after 20 or 30 minutes of no activity.*

Electricity prices are increasing because of the carbon tax.

Partly true. The introduction of renewable energy schemes, expansion of electricity networks and scheduled upgrades of aging infrastructure are all contributors to the increasing cost of electricity. The carbon tax has contributed around 45% to the 2012 electricity price increase. However, over the past four years it is only responsible for about 5-8% of total change to electricity prices.

TIP *The only way to lessen the blow of the carbon tax and other cost increases is to reduce your total consumption. Investigate strategies to reduce consumption, switch use to off peak times and switch to natural gas where possible.*

Recycled paper cannot be used in photocopiers.

Photocopiers can be sensitive to the thickness and humidity of paper and in some cases service technicians may advise against the use of recycled paper. As with non recycled paper there are varying qualities. Contact the copier manufacturer to see what recycled paper they recommend and ensure that when selecting a new copier it is able to operate well with a range of recycled papers.

TIP *Trial different paper types and brands in your machine to identify a reliable recycled paper. When purchasing a new machine, investigate the manufacturer recommendations regarding paper and choose a system that combines low energy consumption with ability to use recycled paper.*

Recycled or tank water stains the toilet bowl.

Water in certain areas may require more filtration than in other areas to appear as clean as town water supplies. If you are concerned about your recycled or tank water contact your plumber to discuss the most appropriate filtration. Don't forget that filters require cleaning or replacement at regular intervals to maintain correct system pressures.

TIP *Ensure that your plumber or consultant designs a filtration system for the factors relating to your water use.*

Turning off lights just shortens the life of the lamp so it is best to leave them on if you are going to come back to a room later.

This is true **but** the cost of electricity used in just a few minutes equates to more than the cost of replacing the lamp a month or two earlier. If you are leaving a room for more than 5 minutes it is cheaper to turn off the light than to leave it on.

TIP *Attach light and/or motion sensors to lights in areas such as toilets where staff may tend to leave them on.*

It is not worth investing in energy efficiency as I rent my premises.

No, this is not true. Now that electricity prices have increased to such a high level there are many energy efficiency upgrades that could be a worthwhile investment. Upgrades such as fluorescent lighting typically pay back in less than two years and can make a big difference to workplace comfort. Investment in solar panels could be worthwhile for suitable businesses where the lease is at least five or six years, though this would reduce to three years if your landlord was interested in splitting the cost.

TIP *Identify the biggest users of energy in your business and buy alternate equipment. Prioritise those with a low payback and implement those that fall within the term of your existing lease. Review annually and adjust as electricity prices change.*

Solar panels for electricity generation are not worth it as our business could never afford to install a system that will meet our whole energy requirement.

No, this is not true. For sites with access to an existing electricity grid connection seeking to become 100% self sufficient is a poor investment. The ideal solar panel system size should be one that just meets your **minimum** midday load, **after** you have implemented energy efficiency upgrades and results in limited electricity export (less than 20%) to the grid.

There are a number of factors that will impact on the system size and suitability, have a look at the "Solar panels and business" fact sheet for more information.

TIP *Identify your daily consumption pattern and changes throughout the year by installing sub-metering or taking hourly meter readings or engage a consultant to undertake an assessment of the optimum solar panel system for your site, based on your consumption trends and cost of electricity.*

Solar panels and business

Would a solar installation benefit your business?

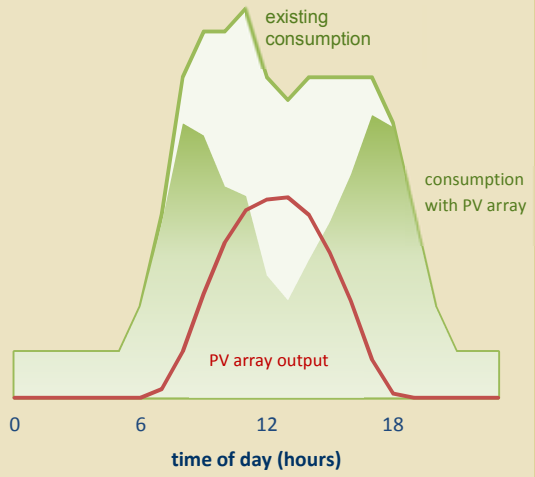
If your organisation typically consumes electricity between 9am and 5pm on weekdays then a solar photovoltaic (PV) system could be a good investment for your business. There are some factors worth considering first though.

- Do you own your premises or does your lease run for at least 5 years?
- Is your daily electricity consumption steady throughout the year?
- Do you have capital funds available for investment?

Figure 1 shows a typical daily profile for a small business. This business:

- Spends about $5,000 pa on electricity
- Operates 8am – 6pm Monday to Friday
- Has a similar daily profile all year (i.e. electricity is used for heating and cooling.

The red line indicates the average output of a 3 kW solar PV array and the shaded green area indicates the new electricity consumption profile at this site if a solar PV array of this size were installed.



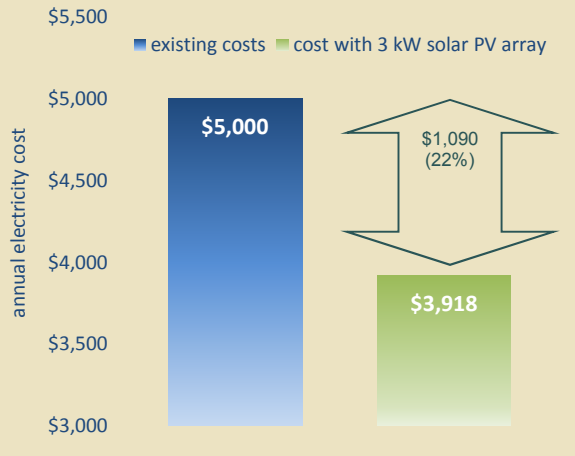


Figure 2 shows the annual savings from installing this system would be **$1,090** or **22%** per annum. System cost could be expected to be $6,000 – $12,000 depending on component selection and installer costs. Based on an average price of $8,000 for installation, at current electricity prices it could be expected that this system would pay for itself within 7 years.

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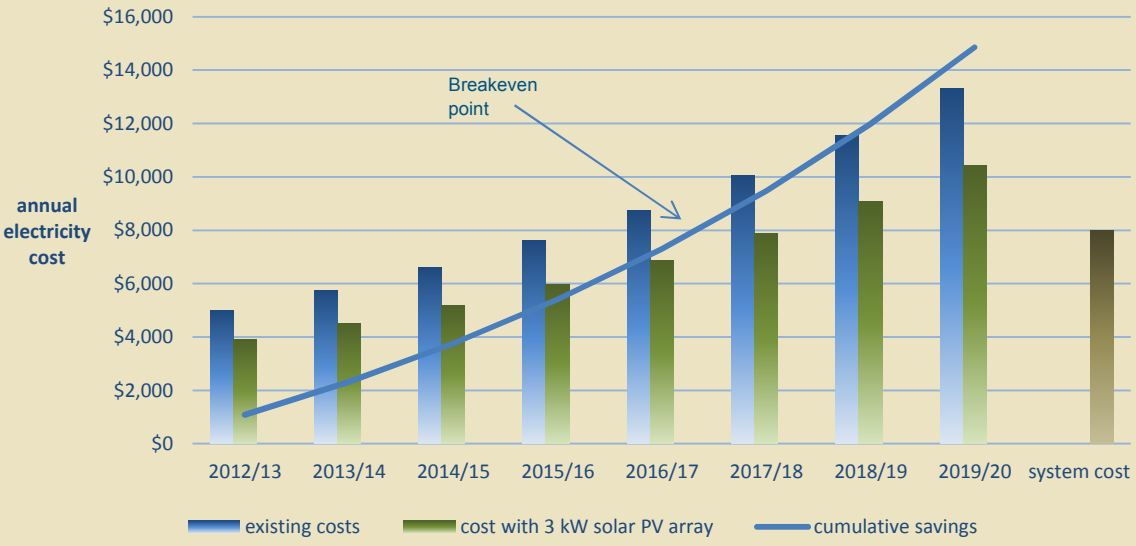
What about rising electricity prices?

A payback period of 7 years is quite long.

However, electricity prices are not expected to stay the same over the coming years. In the past 4 years electricity prices have increased by between 15 and 22% every year.

If an average price rise of 15% pa is considered the savings look quite different. The annual savings could be as high as **$1,500** pa within three years and the total savings to the business in that time could be **$14,850**, which suggests that investment in a solar panel system now could have a shorter payback period of 5 years if electricity price rises are considered.



This example is based on the utilisation of 80% of electricity generated being used on site and the remaining 20% (produced on weekends) being exported at a price of 6c/kWh. If electricity produced on weekends were able to be used on site then the savings would be greater. Other factors such as depreciation and capital improvement have not been included in this example but could result in increased savings.

Is it for my business?

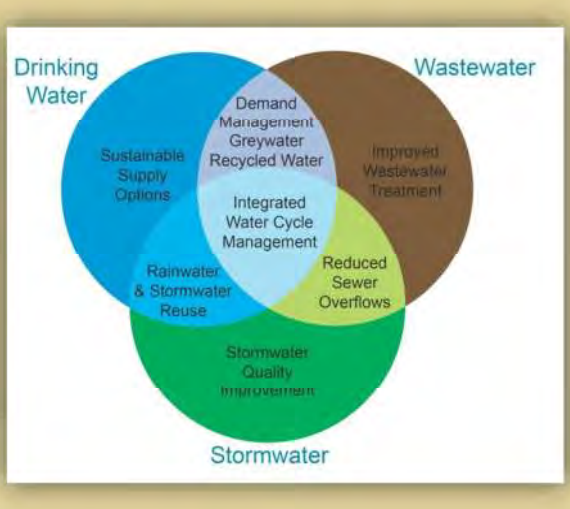
If your business intends to occupy the same premises for at least five years and your electricity usage is over $5,000 pa and is primarily between 8am and 5pm Monday to Friday, then yes a solar panel system is likely to be a good investment for your business. Even if you don't own the premises, investment in a solar panel system could be a good business saving and risk mitigation strategy if you have a longer lease arrangement.

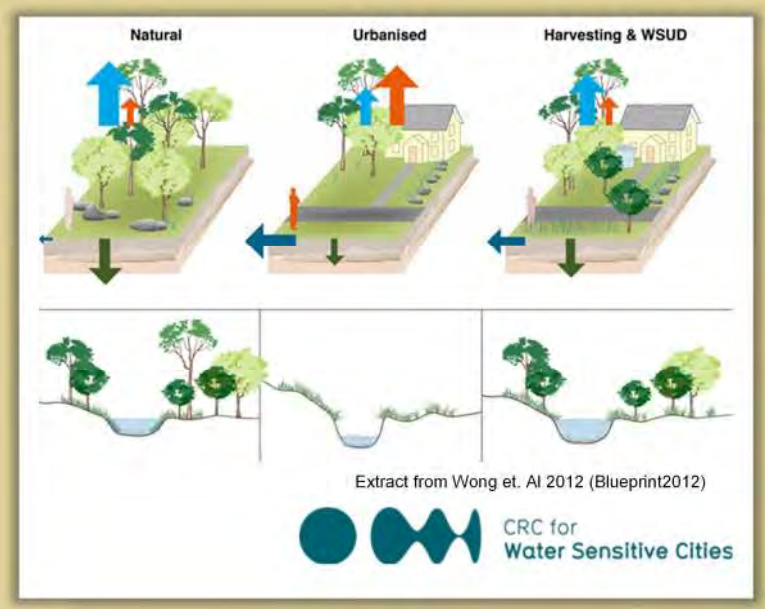
Solar array installed at Colemans Office Products

What is water sensitive urban design?

Australia's rainfall and runoff are among the world's most variable, which makes water management challenging. Water Sensitive Urban Design (WSUD) is an approach to the planning and design of urban environments that supports healthy ecosystems, lifestyles and livelihoods through smart management of all our waters – potable water, wastewater and stormwater.

WSUD is integrated water cycle management, which encourages the efficient use of every drop of water regardless of its source





NATURAL AREAS

Rainfall infiltrates into the soil and waterways and evapotranspiration returns water to the environment.

URBAN AREAS

Rainfall results in stormwater runoff and less infiltration and evapotranspiration, due to the impervious surfaces in urban areas. Rivers and creeks experience frequent peak flows with greater velocities which can lead to erosion, and in drier times less infiltration leads to reduced base flows in creeks and rivers.

WSUD (including water harvesting)

This is a way of managing stormwater runoff to achieve a more natural regime in the built environment. It seeks to slow the water, increase infiltration and reduce runoff through the reuse of water on site and the creation of vegetated swales which increases aesthetics and evapotranspiration.

WSUD Objectives

- Integrate stormwater management into the urban landscape
- Protect and enhance natural water systems
- Provide ecological services in the urban area
- Reduce the heat island effect caused by the built environment
- Treat urban stormwater to meet water quality objectives for reuse and/or discharge to receiving waters.
- Match the natural water runoff regime as closely as possible
- Reduce potable water demand
- Minimise wastewater generation and treatment of wastewater to a standard suitable for effluent reuse opportunities

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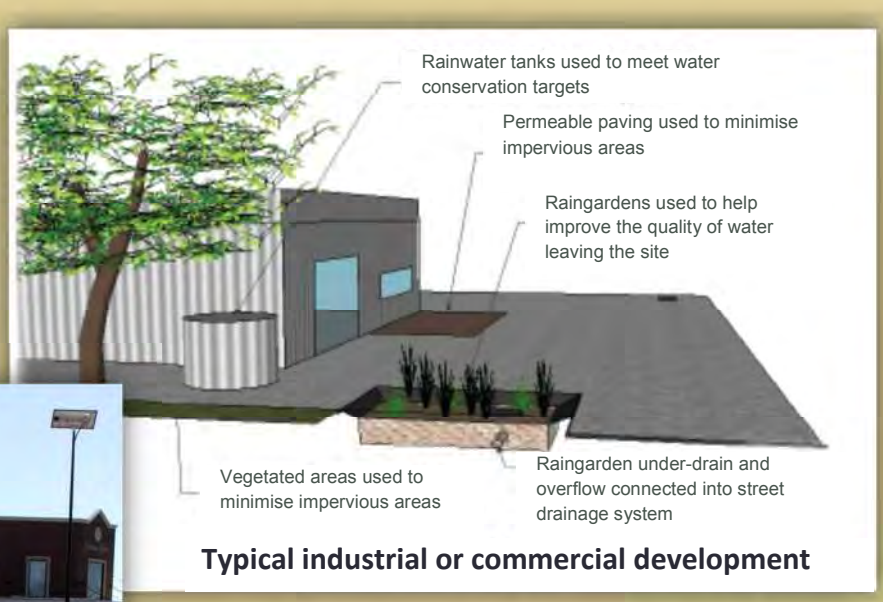
WHAT DOES IT LOOK LIKE?



Typical industrial or commercial development

Raingardens filter pollutants off impermeable surfaces, such as car parks, and add amenity to public spaces.

Rainwater tanks collect water which can be used for irrigation or for toilet flushing, etc, which helps to minimise our use of potable water.

Permeable paving helps reduce runoff and pollutants from the site, helping to protect local creeks and streams

CENTRAL WEST STORMWATER TO SMARTWARTER PLAN

Aims to:

- Improve the quality & quantity of stormwater discharged to all receiving waters;
- Reduce flooding and drainage impacts within and downstream of any proposed development;
- Maximise efficient use of every drop of water consumed in the LGA in a cost effective manner without competing with BASIX; and
- Minimise the impacts of urban salinity, where applicable.

SOURCES

- Central West Catchment Management Authority (CMA)
- WSUD in Sydney – Sydney Metro CMA
- National Water Commission
- Cooperative Research Centre (CRC) for Water Sensitive Cities
- UW urbanwater
- Water by Design
- Melbourne Water

More assistance with Resource Efficiency

Helping you reduce, reuse, recycle and repair to promote a sustainable society

Name of Grant	Who is it for?	What is it?
NSW State Government – Office of Environment & Heritage		
Energy Efficiency for Small Business Program (EESB)	Small businesses • Up to 10 full time staff • Electricity costs of up to $50,000 pa	**Energy Efficiency** **Up to $5,000** (50% co-contribution) for energy efficiency upgrades including: • Heating and cooling systems • Lighting upgrades • Insulation installation • Appliance upgrades
http://www.savepower.nsw.gov.au/business/small-business/energy-efficiency-for-small-business-program.aspx		
Energy Saver	Business spending over $100,000 pa on electricity	**Energy Efficiency** Energy audits subsidised by up to **80%** Up to **30 hours** consulting support to project manage implementation
http://www.savepower.nsw.gov.au/business/medium-to-large-business/energy-saver/get-involved.aspx		
Sustainable Advantage – Resource Efficiency module	All businesses	**Energy, water and waste efficiency** **20-50 hours of expert consultants time** to identify and implement energy, water or waste saving actions
www.environment.nsw.gov.au/sustainbus/SustAdvResourceEff.htm		
Low Carbon Australia Limited		
Low Carbon Australia Limited Energy Efficiency Program	All businesses Energy efficiency projects except: • New builds • Residential Research or commercialisation	**Energy Efficiency** **Low interest finance** for energy efficiency or renewable energy projects costing over $35,000
http://www.lowcarbonaustralia.com.au/page/financial-products-and-services		

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Name of Grant	Who is it for?	What is it?
Department of Energy Efficiency & Climate Change		
Low Carbon Australia Limited Energy Efficiency Program	• Not for profit organisations • Local councils	**Energy Efficiency** 50% co-contribution funding for energy saving projects
www.environment.nsw.gov.au/government/loanfund.htm		
AusIndustry		
Clean Technology Investment Program	Manufacturing sector Businesses using more than 300 MWh of electricity or 5000 GJ of natural gas pa	**Energy Efficiency and Greenhouse gas reduction** 50% co-contribution funding for energy saving projects such as: • replacement of existing manufacturing plant, equipment and processes • modifications to existing manufacturing plant, equipment and processes • changes to energy sources for existing or replacement manufacturing plant or processes • replacement or modification of existing manufacturing facilities to enable production of new low emissions products
www.ausindustry.gov.au/programs/CleanTechnology/Pages/default.aspx		
Clean Technology Food and Foundry	Food manufacturing sector Foundries sector	**Energy Efficiency and Greenhouse Gas reduction** 50% co-contribution funding for energy saving projects such as: • replacement of existing manufacturing plant, equipment and processes • modifications to existing manufacturing plant, equipment and processes • changes to energy sources for existing or replacement of manufacturing plant or processes • replacement or modification of existing manufacturing facilities to enable production of new low emissions products
www.ausindustry.gov.au/programs/CleanTechnology/Pages/default.aspx		
IPART – NSW Energy regulator		
Energy Saving Scheme	Residential and Business in NSW	**Energy Efficiency and Greenhouse gas reduction** Energy Saving Certificate generation for projects that result in electricity savings
http://www.ess.nsw.gov.au/Home		

Sustainability Self-Assessment Tool

WATER

		YES	NO
Are flow restrictors fitted on taps or shower heads?	Flow restrictors offer good water and energy savings (for hot water) when installed on shower heads and on taps and can reduce water wastage by up to 50%. Ensure they are fitted correctly and not on appliances which require water flow for filling purposes such as kitchen and cleaning water supply.	☐	☐
Are dual flush toilets installed?	Dual flush toilets can result in water saving over 10,000 L per annum per employee. If installing a new dual flush toilet, aim for a system with at least a 4 star rating.	☐	☐
Do you regularly look for leaks or water wastage?	Inspect your site quarterly to identify leaky washers and turn off or modify watering systems.	☐	☐
Have you installed a water tank?	Rainwater can be used to water gardens and lawns as well as being able to supply water for toilets.	☐	☐
Have you incorporated WSUD into your site?	Car parks are great areas to collect water for reuse on gardens. Think about improving water collection or infiltration if planning development upgrades.	☐	☐
Are your appliances water efficient?	Most appliances have a water star rating. Aim for appliances with a high star rating to reduce water consumption.	☐	☐

WASTE

Is solid waste separated into recyclable material and general waste?	Sorting waste into different streams such as recyclables, compost and general waste can result in waste removal savings. In some cases sorted waste materials can be used to generate income.	☐	☐

WASTE (continued)

		YES	NO
Has onsite water recycling been considered?	If the site generates large amounts of waste water are there onsite applications for its use such as toilets. Could waste water be re-used in existing processes?	☐	☐

PROCEDURES

		YES	NO
Has your business ever changed processes, procedures or equipment to improve energy efficiency?	Energy prices have risen by 82% between 2008 and 2012. Implementing procedures and policy to improve energy efficiency in the workplace can result in high cost savings. Simple strategies such as ensuring lights, computers and copiers are turned off overnight can result in annual savings of hundreds of dollars.	☐	☐
Do you have a planned maintenance program in place?	Planned maintenance can result in reduced energy costs. Cleaning filters and vents in air conditioning systems results in lower fan loads. Similarly ensuring motors and pumps are regularly maintained reduces avoidable system failures as well as identifying faults that can lead to higher current draw and higher energy consumption.	☐	☐
Have you identified equipment that is running inefficiently?	Regular maintenance is important to ensure proper operation of all equipment. Monitoring equipment can identify faults on many electrical appliances, engaging an electrician to conduct testing on suspect equipment can result in significant cost saving and reduce down time through unexpected equipment failure.	☐	☐

LIGHTING

		YES	NO
Do you have any lighting control systems installed (automatic timers, light level sensors)?	Lighting a site when unoccupied or when not required (during the day) is a huge waste of energy and results in unnecessary business costs. An external spotlight that operates all day and night may cost over $550 per year.	☐	☐
Is energy efficient lighting installed?	Lighting technology has changed in the past few years and lighting upgrades offer a fast way to create business savings. Consider upgrading T8 (1 inch diameter) fluorescent lamp fixtures with T5 fluorescent fixtures - not only do the lamps use less power to produce more light but the fixtures themselves use less power. Consider replacing halogen down lights with LED fixtures which use 20% of the power and last up to 50 times longer.	☐	☐

OFFICE EQUIPMENT

		YES	NO
Are computers and monitors turned off outside office hours?	Each computer left on or in standby overnight can end up costing the business over $370 per annum. Look for computers with a high Energy Star rating and low idle power when replacing computer systems.	☐	☐
Are photocopiers turned off outside office hours?	Photocopiers, particularly older models, use a high amount of power when on standby. In some systems the power consumed by a copier in standby can total over $250 per annum. The power save button on a copier usually only switches off the screen display and often only reduces standby power by as little as 10%. Look for low standby power features (less than 15W) when purchasing new copiers.	☐	☐

HEATING AND COOLING

Are employees happy with the comfort level of the workplace throughout the year?	If employees become dissatisfied with the workplace environment it may be an indicator that the installed air conditioning system is due for upgrade or maintenance. Over time refrigerant leakage, dust or evaporation can reduce system performance. If you make changes to your office layout or introduce new equipment, consider that this may increase the load on your system.	☐	☐
Is ceiling insulation installed?	Ceiling (and ideally wall and floor) insulation can result in reductions of up to 30 to 40% on heating and cooling costs in the workplace and should be installed when possible.	☐	☐
Are external doors always closed (other than for normal through traffic)?	For external doors left open for extended periods, consider relocating the door or installing/upgrading automatic controls on the doors. Alternatively, rearrange the office or shop layout to minimise unnecessary door operations. Automatic shop front doors in retail outlets, that are triggered by passing pedestrians, can result in the doubling of heating and cooling costs.	☐	☐
Is air conditioning turned off to unoccupied or rarely used spaces (i.e.. storerooms, toilets)?	Review air conditioning outlet locations and consider reducing or closing off unnecessary outlets.	☐	☐

STANDBY MODES

Is all equipment shut down when it is not required?	Turning off equipment is an obvious way to save energy costs. Turning off a computer in non-working hours will reduce operating costs by $370 per computer. Timers can be used on appliances such as instant hot water units, printers and photocopiers that have a regular weekly use. Attaching a timer to a zip hot water unit will save around $300 pa at a cost of less than $40.	☐	☐

ENERGY PURCHASING & INVESTMENT

		YES	NO
Has your energy billing contract or tariff been reviewed in the past 12 months?	Electricity billing can be confusing to understand and there are a range of tariffs provided by all energy retailers. Many businesses could save electricity costs by changing to a different tariff (often with the same supplier). Usually this can be done at no cost and can save thousands of dollars per year.	☐	☐
Have you compared current pricing with other suppliers?	It is important to review your energy accounts annually to ensure you are continuing to receive the best deal. Ensure you compare your existing contract with other suppliers on a regular basis.	☐	☐
Does the business own the workplace premises?	Investment in energy efficiency upgrades at your site can not only reduce operating costs and increase profits but add value to your site. Investment in upgrades such as solar, hot water systems or lighting will all reduce running costs.	☐	☐
Has your business installed any devices or appliances with more energy efficient models in the past 2 years?	Upgrading appliances with newer more energy efficient models should be investigated at regular intervals. Electricity prices have increased by 37% in the past 2 years. Replacing an old bar fridge in the staff kitchen could result in annual savings of over $150.	☐	☐
Do you monitor your business's energy use?	Energy monitoring can identify anomalies in consumption, flag metering errors, faulty equipment and can lead to large cost reductions. Familiarity with site consumption patterns will help to identify higher consumption or changes to consumption patterns which may be caused by gas leaks or malfunctioning equipment.	☐	☐
Have you ever investigated alternative energy sources?	Gas is four times cheaper than peak electricity per unit of energy supplied; it therefore makes a great alternative in heating applications such as hot water. Renewable energy options such as wind and solar could also create good investment options to reduce the impact of rising energy prices.	☐	☐

POWER FACTOR (large sites)

Is your power factor always greater than 0.95?	Depending on your billing and tariff you may be incurring demand charges which can be higher than necessary if your site operates with a poor power factor. An energy management consultant can review your site's energy data and calculate savings that could be made by installing power factor correction. In some larger organisations such as pubs, motels and industrial facilities the cost of not correcting power factor can mean thousands of dollars of unnecessary cost.	☐	☐
Have you investigated demand control or load shedding to reduce peak demand?	Switching non-critical activities and system operation to non-peak times is another way to avoid high demand costs at larger sites. Analysis of site interval data can identify peak load times at the site and strategies to minimise peak demand and high energy costs.	☐	☐

HOW DID YOUR BUSINESS RATE?

Less than one 'Yes' in each applicable category - **More Work to do**
Please take the time to review the suggestions we have provided below, they are very often able to be implemented at little or no cost.

Action Plan	
Install compact fluorescent lamps instead of incandescent lamps	☐
Get quote for dual flush toilets	☐
Calculate annual electricity costs	☐
Change air conditioning set points to 20°C (winter) and 24°C (summer)	☐
Purchase a second bin for the staff kitchen to encourage recycling	☐

At least one 'Yes' in each applicable category – **Well Done**
You are well on the way to operating more sustainably. Review those you have marked 'No' and see what might take your business to the next level of sustainability and profitability.

Action Plan	
Get a quote for ceiling insulation	☐
Contact a consultant to identify the best electricity tariff and supplier	☐
Update office procedures to include equipment shut down	☐
Instigate quarterly water inspections	☐

More than one 'Yes' in each applicable category – **Outstanding**
You may well benefit from an energy assessment to see if there are any other opportunities you might consider in order to continue to maximise your business's sustainability and profitability.

Action Plan	
Get a quote for upgrade of T8 fluorescent lighting to T5 lighting	☐
Get a quote for installation of a solar photovoltaic system	☐
Identify energy saving alternatives for existing equipment, and prioritise for replacement or upgrade when funds become available	☐
Report energy consumption changes to staff and reward staff initiatives	☐

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This program has been assisted by the NSW Government through its Environmental Trust.