Australian Government

Department of the Environment, Water, Heritage and the Arts

NSW Business Chamber

Sustainability Toolkit – Offices

Invigorating Business Results

Australian Government

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Opening

Climate change will affect every Australian business and is one of the most critical risk factors that will impact the viability of businesses. As a result, climate change and sustainability have moved beyond buzz words to being significant factors in business planning and operations. Business sustainability preparation is more than environmental preservation, it recognises the impact of businesses on society, employees and the collective wealth of a nation. It also helps businesses improve efficiency and productivity, which makes good business sense – economically, environmentally and socially.

Although larger businesses have generally been the first movers in addressing climate change within their organisations, all businesses will be impacted, regardless of size. The effects of climate change regulation on large businesses and industries will be passed on throughout the supply chain and will be felt by everyone, even though direct compliance will not impact most businesses. Early preparation for climate change and energy regulation is the most efficient and cost effective way to ensure the long-term survival of your business.

NSW Business Chamber recognises that business owners and operators are essential to the livelihood of the Australian economy, but are often neglected in sustainability information sources. To address this issue, we have developed a practical and tailored toolkit to assist and advise micro, small, medium and large businesses that seek to understand and implement their own sustainability programs. The sustainability toolkit is one component of a multitude of business resources to assist in the transition to a carbon-constrained economy.

We are also taking on the challenge to become more sustainable ourselves. The NSW Business Chamber has joined the Sustainability Advantage Program, administered by the NSW Department of Environment and Climate Change, and we have made significant progress in achieving sustainability best practices.

I congratulate businesses that have taken on the challenge of becoming a more sustainable organisation and in doing so, support their community and the environment. We encourage members to document their successes and let their clients, industry and stakeholders know and engage in the process.

It makes good business sense to be sustainable.

Kind regards,

Kevin MacDonald
CEO, NSW Business Chamber

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Sustainability: Making sense into cents...

Reducing energy, water and waste consumption in your organisation makes great business sense. It can:

> Save money
> Minimise climate change risk
> Enhance business image
> Improve customer and staff satisfaction

This toolkit serves as an introductory guide to basic sustainability principles, practices and actions that any business can employ to help manage their costs and climate change impacts.

Section I: Understanding Sustainability

What is sustainability?

Sustainability is a form of progress or development that meets current needs without compromising the ability of future generations to meet their needs. It is a term used to describe process impacts on climate change, water, energy, natural resources and waste.

Sustainability involves accounting for three main factors: environmental, economic and social considerations. These three principles are often referred to as the **triple bottom line** (TBL). In practical terms, the TBL goes beyond traditional financial accounting and estimates the impact of a process, such as a specific business operation, on social and environmental performance.

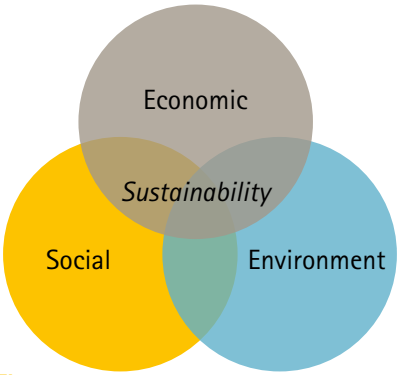


Figure 1.
Sustainability and TBL Diagram

In the business community the TBL is frequently addressed through **corporate social responsibility** (CSR). CSR is a concept whereby organisations take responsibility of (and frequently report on) the environmental and social interests of stakeholders impacted by their business practices. Stakeholders include a contingency of customers, suppliers, employees, shareholders and the local community. At this stage, CSR is an optional responsibility measure and the degree of disclosure and action differs greatly depending on companies' sustainability goals.

Standardisation of the various business sustainability reporting mechanisms is underway through the **Global Reporting Initiative** (GRI), which aims to combine sustainability, TBL and CSR reporting into one common framework. This system can then be used as a consistent gauge of businesses' influence beyond financial measures. At this stage, the GRI framework is optional and mainly designed for the very large businesses.

Sustainability in the workplace

Sustainability is not a passing fad or one-off project, it is a critical decision making process that will aid your business in managing its costs and environmental outcomes as well as provide benefits to customers and employees. The principles of sustainability, outlined in this toolkit, should be factored into core business decisions the same way cost, service and risk are addressed in traditional organisational planning. There are many benefits to accounting for sustainability in your business decisions, including cost reduction, improved process efficiency, reduced environmental impacts and enhanced company image. Thus, integrating sustainability into business planning, policies, practices and training should be considered standard practice, not an optional add-on.

What is climate change?

Climate change, often used interchangeably with global warming, refers to any significant change in climate such as temperature, precipitation, or wind, lasting for an extended period such as decades or longer. Global warming is an average increase in the temperature of the atmosphere near the Earth's surface and in the troposphere, which can contribute to changes in global climate patterns[1]. Whether manmade or naturally occurring, climate change is having a noticeable impact on the environment. Within a lifetime, serious environmental changes are being observed which will diminish the capacity we have to maintain our quality of life and provide for future generations.

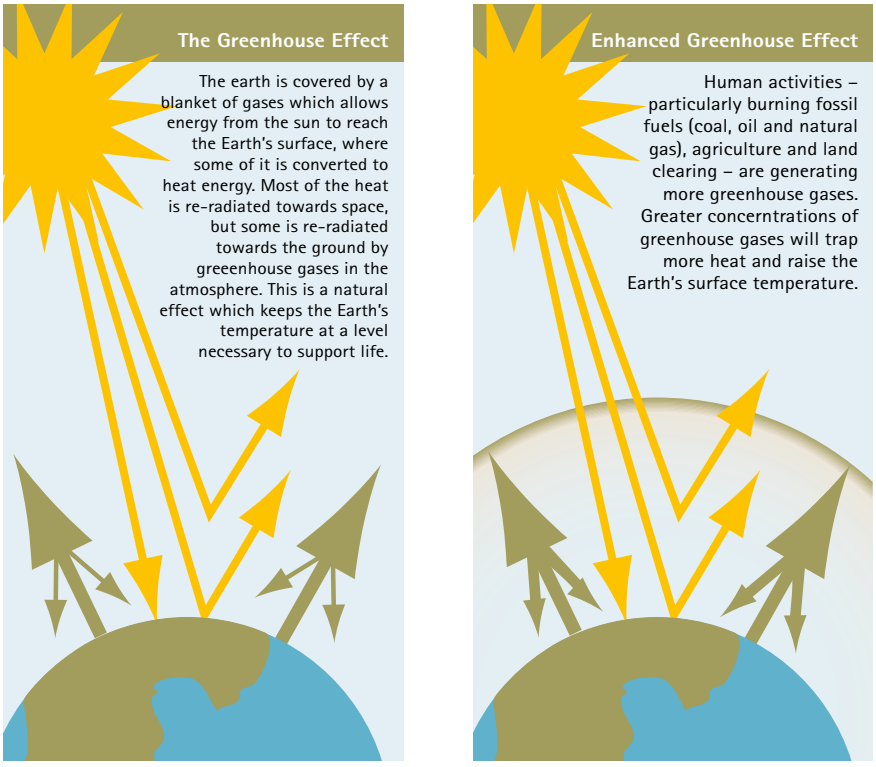


Figure 2. Greenhouse effect[2]

Climate change and global warming are caused by greenhouse gases (GHG) which create a 'greenhouse effect' of warming the earth. Greenhouse gases are a natural part of the atmosphere. They absorb and re-radiate the Sun's warmth and maintain the Earth's surface temperature at a level necessary to support life. The problem we now face is that human actions, particularly burning fossil fuels such as coal, oil and natural gas, and agriculture and land clearing, increase the concentrations of the gases that trap heat. This is the enhanced greenhouse effect, which is contributing to a warming of the Earth's surface and creating dangerous side effects such as increased frequency and intensity of storms, droughts, flooding and raising sea levels[2].

Under the Kyoto Protocol Agreement that Australia ratified in 2007, a mixture of six types of greenhouse gases are monitored and targeted for reduction to address climate change. For ease of understanding, these six gases are then changed and reported in the equivalents of carbon. So climate change is not just carbon emissions, it is a combination of six main greenhouse gases. Each of these gases has a different potential for trapping heat, which is know as the **global warming potential** (GWP). For example, carbon dioxide (CO_2) has a GWP of 1, while methane (CH_4) has a GWP of 23, meaning CH_4 has more potential to trap heat than CO_2, even though it exists in smaller relative quantities then CO_2.

Note: The terms carbon emissions, emissions and greenhouse gas emissions are used interchangeably in this toolkit.

Climate change in Australia

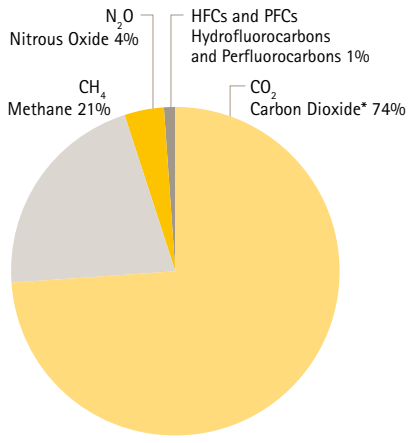
Research by Australian and international scientists shows that although Australia's contribution to climate change is minimal on global levels, its environment and economy will likely be one of the fastest and hardest hit by climate change due to the extreme heat and dryness of the continent. Rising global temperatures are projected to increase the risk of rising sea levels, bushfires, flooding, drought, changes in biodiversity and ecosystems, evaporation rates, water quality and availability and extreme weather/storms. These risks could dangerously impact Australians' personal lifestyles, businesses and Government.

Consequently, Australia is being proactive in addressing and understanding climate change mitigation and adaptation.

How Australian businesses and economic systems cope with these impacts depends on the extent and rate of climate change, and on their capacity for adaptation. Australia's CSIRO concluded that reducing carbon emissions would reduce the rate and magnitude of climate change, thereby allowing businesses more time to adapt. Acting early to cut emissions reduces damage and buys much-needed time[4].

To address climate change issues and meet its commitments under the Kyoto Protocol, the Australian Government plans to implement a carbon trading scheme called the Carbon Pollution Reduction Scheme (CPRS). CPRS is a cap and trade scheme that is targeted to reduce Australia's carbon emissions between 5 per cent and 15 per cent below 2000 levels by the end 2020. The cap achieves the environmental outcome of reducing carbon pollution. The ability to trade ensures carbon pollution is reduced at the lowest possible cost.

Figure 3. Contribution to total net CO_2-equivalent emissions by gas 2006 in Australia[3]



* Includes confidential emissions reported as CO_2e

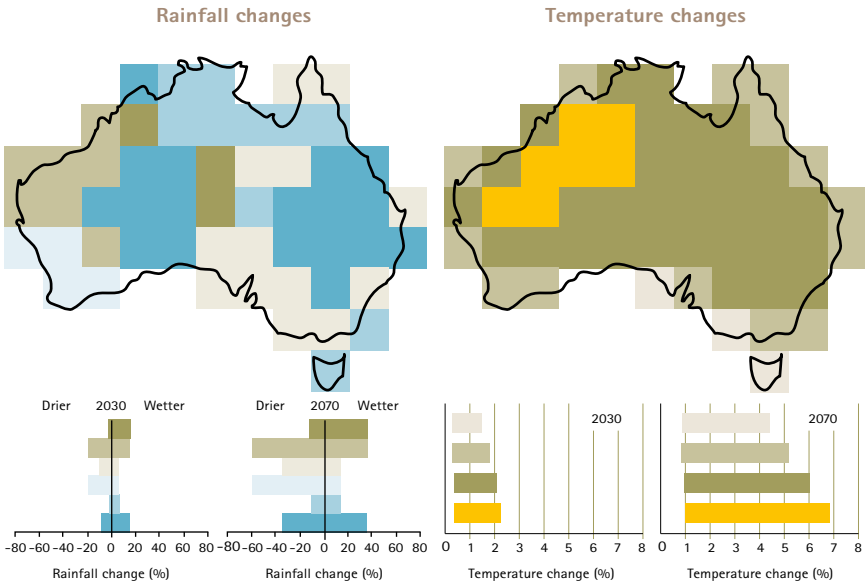


Figure 4. Projected changes in Australian precipitation (left) and temperature (right) in 2030 and 2070[5]

Risk Management

Climate change and sustainability can be considered in terms of business risk management. Every business needs to understand the major risks to its operations and profitability; this is no different in the context of sustainability. Aspects of sustainability such as energy and water are critical to every business and a lack of availability or large increases in costs could have significant negative impacts on the business bottom line.

The core climate change risks to businesses are:

- Higher energy costs
- Increased general business costs including insurance premiums, raw materials, transportation, etc.
- Loss of revenue
- Increased legislative requirements
- Consumer expectations for 'greener' businesses and products

Australian obligations through the Kyoto Protocol and similar international environmental agreements have resulted in additional legislation that impact businesses. Such legislation mainly targets large and very large businesses; however, the impact will also be felt by supportive businesses through the supply chain. This could result in corporations providing their own 'legislation' on products and services purchased. For example, in their efforts to meet their own sustainability goals, larger businesses may manage their suppliers by requiring them to demonstrate proof of 'green' initiatives, environmental management systems or policies. The best management of climate change risks and sustainability is to act early and prepare for doing business in a carbon-constrained economy. This will identify and allow for changes where necessary, as well as position a business ahead of its competitors.

Identifying the areas of your business that are at risk to climate change will help identify and prioritise immediate and longer term actions to address these risks. Each business will need to evaluate climate change risks based on its individual operating requirements and procedures. However, the key areas to consider include:

Physical structure risks

- Increased insurance premiums due to climate change issues
- Structural damage from storms, fires and floods
- Transportation delays or interruptions due to storm, heat and/or water damage

Supply cost risks

- Increased raw material costs
- Increased supply costs
- Increased transportation costs
- Decreased water availability
- Increased water costs
- Increased energy costs
- Interruption or cessation of supply flows

Regulatory and litigation risks

- Carbon emission liabilities
- Loss of tenders due to lack of sustainability or environmental policy
- Non-compliance fines
- Business delays from lack of preparedness for regulations
- Liability for non-compliance with regulations or non-disclosure
- Liability for non-compliance with client sustainability requirements

Market and competitive risks

- Loss of new and existing consumer base by not offering green products and operating procedures
- Loss of market share to competitors offering of greener products and services

Reputation risks

- Lack of consumer/client confidence in organisation
- Appearance of being less innovative and not proactive compared to competitors
- Loss of revenue resulting from decreased patronage

After the key climate change risks have been identified, it is helpful to prioritise these risks and form an action plan. One way to organise operating risks around climate change is to create a risk analysis matrix. The following risk analysis matrix demonstrates how to evaluate the urgency of addressing your organisation's risks. By organising the risks based on likelihood and impact, you can assess which areas are the highest and lowest risks to your organisation and plan accordingly.

Additional assistance in risk assessment is available to businesses through programs such as Sustainability Advantage (NSW Department of Environment and Climate Change) as well as through professional consultants for a fee.

Table 1. Sample Risk Matrix

What is the chance it will happen? Likelihood ↑			
Very Likely	Acceptable Risk (Medium)	Unacceptable Risk (High)	Unacceptable Risk (Extreme)
Likely	Acceptable Risk (Low)	Unacceptable Risk (Medium)	Unacceptable Risk (High)
Unlikely	Acceptable Risk (Low)	Unacceptable Risk (Low)	Unacceptable Risk (Medium)
	Minor	Moderate	Major
	Impact → How Serious Is The Risk?		

Table 2. Sample Risk Analysis

Risk	Likelihood	Impact	Risk Score	Sample Actions
Supply risks				
Increased supply costs	Very likely	Major	Unacceptable risk	> Print double sided > Investigate supply reduction and reuse options (recycling, change to electronic invoicing)
Increased energy costs	Very likely	Major	Unacceptable risk	> Implement 'low hanging fruit' energy reduction options (use energy efficient light bulbs, adjust thermostat) immediately > Develop plan for future energy consumption reduction options
Increased water costs and restrictions	Very likely	Moderate	Unacceptable risk	> Implement 'low hanging fruit' water saving measures (install water saving taps, fix leaks) > Investigate longer term water savings investments (rainwater tanks, grey water recycling, dual-flush toilets)
Market and competitive risks				
Customer demand for 'greener' products and facilities	Likely	Moderate	Unacceptable risk	> Review operations, supplies and products for 'greening' opportunities > Join government sustainability assistance program such as Sustainability Advantage
Green or sustainability requirement for tendering	Likely	Moderate	Acceptable risk	> Develop an environmental or sustainability policy statement > Join government sustainability assistance program such as Sustainability Advantage > Denote sustainability measures in Request For Proposals

Benefits Of Early Response

Businesses that take early steps to mitigate and adapt to climate change will be better prepared for any changes in regulations, save money through efficiency and be ahead of competitors that are slow to address climate change issues. Business operators may also find they are able to capitalise on climate change as a revenue-generating opportunity by developing and marketing technologies, products and services that help others reduce their emissions, improve their resilience to the effects of climate change and become greener consumers. Government and large industry initiatives aimed at reducing emissions will create new markets for such products and services, as will customer preferences for more environmentally friendly options.

Benefits of early action include:

> Cost savings
> Increased efficiency
> Competitive advantage
> New customers
> Increased customer loyalty
> Preparedness for new legislation

On the contrary, inaction could ultimately mean reduced revenue and possibly business failure due to increased operating costs and loss of competitive advantage. Savvy businesses recognise the threats and pursue the opportunities instead.

Section II: Getting Started

Making the decision to pursue or at least become aware of sustainability in business is commendable. When the decision has been made the following are important early steps take.

Step 1: Obtain management commitment

Step 2: Understand historical and current resource usage

Step 3: Establish baselines, benchmarks and targets

Step 4: Audit

Step 5: Prioritise an action plan

Step 6: Monitor and measure

Step 7: Staff engagement

Step 1: Obtain management commitment

The most important step in taking an active approach to sustainability is to obtain senior management commitment. It is not sufficient to just have CEO/General Manager initiation; it is necessary to get the senior managers engaged in the project as well.

Management's support is necessary as they tend to have an overall view and active participation in daily business operations and strategy development. Management is likely to be responsible for implementing change. In smaller businesses, it is the business operator or owner who will need to demonstrate this commitment.

It is important to publically record commitment to sustainable practices for annual recognition and measurement as well as for stakeholders to be aware of your actions. For example, NSW Business Chamber has displayed their 'Commitment' online as a way of demonstrating that actions are being taken to become more sustainable.

As sustainability becomes part of the organisation's culture, it will be important to continually review and update the sustainability commitments. Furthermore, measurable goals will need to be included in the commitment to ensure that performance can be measured.

As a business operator, it is important that you lead by example. So if change is necessary to a process, it is incumbent on you to demonstrate that being sustainable works.

Step 2: Understand historical and current resource usage

In order for a business to progress and realise savings, it is necessary to know the resource usage history and analyse the findings.

Obtain the following historical information:

- Energy usage (gas and electrical)
- Water usage
- Waste / garbage services
- Transportation (only if easy to obtain)

Many general suppliers will have your business on record, it might require an administration fee, but they should be able to provide you a summary of your usage.

Organise this information into a meaningful format, such as Figure 5 below.

As seen in Figure 5, water usage at this business goes through troughs and peaks throughout the year. In this case, after investigation it was found that the air-conditioning systems utilised more water during summer than winter. It was also found that water usage on average declined each year. Through investigation, the most probable cause was that leaks and maintenance had been more pronounced, resulting in lower consistent water usage.

When you receive a bill relating to sustainability (energy, water and waste), it is necessary to record the financial and consumption usage. Too often the bills are paid without checking for errors or major changes. After all, you can only manage what you can measure. An example of how to record usage is provided below in Table 3.

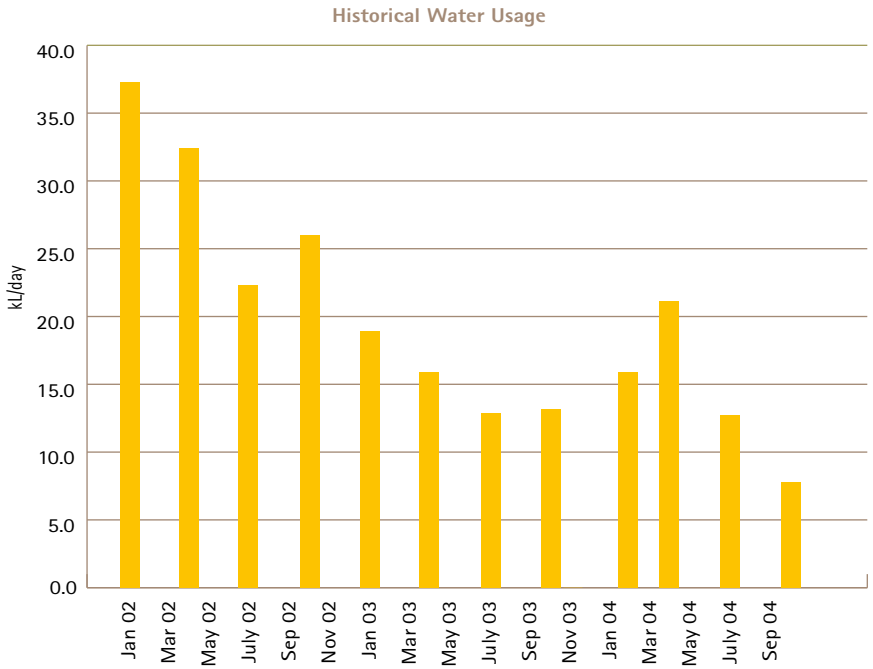


Figure 5. Historical water usage for a business

Table 3.
Site water consumption record

Date Reading Taken	Usage (kL/day)	Costs ($)
22/01/02	37.3	2349.90
12/04/02	32.4	2041.20
07/07/02	22.3	1404.90
09/10/02	26.0	1638.00
20/01/03	18.9	1190.70
24/04/03	15.9	1001.70
23/07/03	12.5	787.50
24/10/03	13.2	831.60
02/02/04	15.9	1001.70
27/04/04	21.1	1329.30
21/07/04	12.7	800.10
26/10/04	7.6	478.80
Average	19.7	1237.95
2004 Average	14.3	902.48
2003 Average	15.1	952.88
2002 Average	29.5	1858.50

Since Figure 5 and Table 3 are linked to the same business, it can be seen that usage has gradually decreased, resulting in financial savings of 50%.

Table 4.

Business Activity Indicator
The business activity indicator is a unit of measurement that represents the business operation. Preferably it is the same indicator that your organisation uses to assess business efficiency. For example:

- For commercial buildings and shopping centres "leasable area" in m^2
- For hotels and hospitals "number of bed nights or meals"
- For manufacturing and laundries "quantity of production" in tonnes or other units
- For education "number of full time student equivalents"
- For irrigators "area" (i.e., golf courses, show grounds reserves) in m^2
- For swimming pools, clubs and pubs "number of patrons"

Table adapted from NSW Department of Energy, Utilities and Sustainability *Guidelines for Water Savings Action Plans, 2005.*[6]

Step 3: Establish baselines, benchmarks and targets

Baseline

Once historical and current usage data have been obtained, it is important to establish a baseline. A baseline is the amount of a resource (water, energy, supplies and waste) that your business typically uses. The baseline is used as the comparison rate for monitoring future progress and benchmarking against industry standards. Using the average consumption rate from a recent year (12-24 months) is an appropriate baseline. For example, if the business in Table 3 used 2002 as their water baseline, they would use $1,858.50 and 29.5 kL/day to evaluate their progress in terms of usage and cost savings.

Regular monitoring of usage and cost against the baseline will identify the efficacy of your sustainability efforts and also alert you to any discrepancies that need to be resolved, such as leaks or equipment that needs to be repaired.

Table 5. Baseline Water Use (Sample Assessment)

Organisation Name		
To be completed for all sites that are included in the organisations sustainability action plans.		
Site Description	**Normal operation**	**Variation from normal operation**
Address	123 Sydney Street	321 Newcastle Street
Sydney Water Account number	12 23456 789	987 65432 21
Baseline start date	1-Jan-2006	1-Jan-2006
Baseline end date	1-Jan-2007	1-Jan-2007
A = baseline water use per annum (kL)	50,000	50,000
Business Activity Indicator	Tonnes	Tonnes
B = Quantity of site business activity indictor per annum (corrected for variations)	1,800	2,000
Is baseline representative of normal water use (Yes/No)	Yes	No
If no, description of variation (i.e., restrictions, shutdowns, refurbishments, etc)		Plant shutdown for (July – August 06)
C = Impact of variation on water use (i.e. variation from normal) kL per annum	0	-8,000
D = A + C baseline water use corrected for variation (kL)	50,000	42,000
E = D/B baseline water use key performance indictors (KPI)	27.8	21.0
Baseline KPI units	kL/tonne	kL/tonne

Table adapted from NSW Department of Energy, Utilities and Sustainability *Guidelines for Water Savings Action Plans, 2005.*[6]

Table 6. Baseline Energy Use (Sample Assessment)

Organisation Name			
To be completed for all sites that are included in the organisations sustainability action plans. Energy consumption should be reported in most appropriate units – i.e., kWh, GJ, etc.			
Site number/name	**1**	**2**	**3**
Address	123 Sydney Street	321 Newcastle Street	456 Ballina Street
Energy provider Account number	123 4567 89	987 6543 21	654 4568 45
Baseline start date	1-Jan-2006	1-Jan-2006	1-Jan-2006
Baseline end date	1-Jan-2007	1-Jan-2007	1-Jan-2007
A = baseline energy use per annum (kWh)	50,000	66,000	65,000
Greenhouse Emissions	Tonnes	Tonnes	
(see NABERS)	45 Tonnes	59 Tonnes	59 Tonnes
Business Activity Indicators	m^2	m^2	tonnes
B = Quantity of site business activity indicator per annum, corrected for variation	1,800	2,000	25,000
Is baseline representative of normal energy use (Yes/No)	Yes	No	No
If no, description of variation (i.e., restrictions, shutdowns, refurbishments, etc)		Increased energy consumption due to office refurbishment for 2 months	Decreased energy consumption due to March 2006 unscheduled shutdown
C = Impact of variation on energy use (i.e. variation from normal) kWh per annum	0	8,000	-3,000
D = A + C baseline energy use corrected for variations (kWh)	50,000	58,000	62,000
E = D/B baseline energy use key performance indictors (KPI)	27.78	29.0	2.48
Baseline KPI units	*kWh/m^2*	*kWh/m^2*	*kWh/tonne*

Table adapted from NSW Department of Energy, Utilities and Sustainability *Guidelines for Energy Savings Action Plans, 2005.*[7]

Table 7. Baseline Waste and Recycling Generation (Sample Assessment)

Waste and recycling baseline	
Complete separately for waste and recycling	
Quantity Collected	Number of containers collected multiplied by volume or weight of the container Example: Your organisation has 10 wheelie bins of paper collected for recycling (or waste) each month. 10 X 240L Bins = 2,400L of paper collected/month 2,400 X 12 = 28,400L per annum 28,000 ÷ 1,000 (to convert litres to cubic metres) X 0.24 (to convert cubic metres to tonnes) = 6.9 tonnes per annum
Cost	Number of containers multiplied by cost of pickup per container. Example: Waste contractor charges $5.50 to pick up each paper recycling bin 10 X $5.50/bin = $55.00 to recycle paper each month = $660 per annum

Adapted from A WRAPP Guide to Conducting an Office Waste Assessment[8]

A simple alternative waste baseline determination method is to weigh waste materials over ten normal, consecutive working days. Then extrapolate weight measurements over the month or year to determine average waste generation. Certain times of the year, such as end of financial year and school holidays, should be avoided when utilising this method. This method can also be used separately for recycled materials.

Benchmarking

Benchmarking your resource consumption against industry average guidelines will help determine potential savings opportunities. Use the benchmarks below as a guide to indicate the possible savings in your building. If your baseline resource consumption is higher than the benchmarks below, there is a good chance there are leaks or inefficiencies in your building's systems. Note, you may need to convert your baseline to the same units noted in the benchmarks, see key performance indicators below.

Key Performance Indicators (KPIs) and targets

It is important to identify resource key performance indicators (KPIs) for your building and set reduction targets. KPI's are quantifiable measurements that reflect your progress towards meeting your sustainability goals. You can determine resource KPI units by using the benchmarks below. For example, the most common water related KPI for commercial office buildings is kL/m^2/year, which is the number of kilolitres of water used per square meter of office space per year[9].

Resource reduction targets can also be determined by the benchmarks below. For example, the economic best practice benchmark (Tables 9 and 10) for water use in office buildings without cooling towers is 0.47 kL/m^2/year, this will be the water usage target you aim to achieve and exceed.

Therefore, the actual amount of water you are targeting to conserve per year is determined by subtracting 0.47 kL/m^2/year

from your baseline score. Note: You may need to convert your baseline into KPI units.

Whether your business receives a low or high rating, remember there are always improvements and efficiencies that can be made to become more sustainable.

NABERS Ratings for offices

A NABERS rating accurately compares the performance of your office to other similar premises, and can assist you to manage the impact of your office on the environment. NABERS ratings for offices include Energy, Water, Waste and Indoor Environment.

NABERS is the industry standard for measuring and benchmarking the environmental performance of existing Australian buildings, incorporating the trusted Australian Building Greenhouse Rating for offices. NABERS is a national initiative of federal, state and territory governments, and is managed by the NSW Department of Environment and Climate Change.

NABERS ratings are based on actual data related to the performance of your premises over the last 12 months. For a certified rating that you can promote, you will need to engage a NABERS Accredited Assessor to calculate your rating. This will enable you to use the NABERS trademark. You can self-assess the environmental performance of your office premises at no cost using the NABERS Rating calculator – www.nabers.com.au/office.aspx - but cannot promote this rating.

Energy benchmarks

Table 8. Energy Benchmarks (based on NABERS ratings)

	NABERS Rating	Kg CO_2/m^2 Carbon emissions[10]
Tenancy	1	172
	1.5	158
	2	144
	2.5	131
	3	117
	3.5	103
	4	89
	4.5	76
	5	62
Base building	1	199
	1.5	183
	2	167
	2.5	151
	3	135
	3.5	119
	4	103
	4.5	87
	5	71
Whole building	1	372
	1.5	342
	2	313
	2.5	283
	3	253
	3.5	223
	4	193
	4.5	164
	5	134

Table adapted from NABERS Benchmarks v6.0[10] and Sydney Water Best practice guidelines for water conservation in commercial office buildings and shopping centres[9]

Note: Conversion to kWh/M^2/year may be required. To effectively compare the performance of your building against these benchmarks, the NABERS rating calculator should be used: www.nabers.com.au/office.aspx.

Table 8 Assumptions for energy benchmarks:

- Density of computers: (m^2/computer) 23
- Hours of operation/week: 50
- Building location Sydney

Water benchmarks

Table 9.
Quick reference of water efficiency benchmarks in Sydney office buildings[9]

Benchmark	Offices with cooling towers	Offices without cooling towers (extrapolated figures)
Median market practice with no leaks	1.01 kL/m²/year	0.64 kL/m²/year
Economic best practice (median of implementing water savings projects with two year paybacks	0.84 kL/m²/year	0.47 kL/m²/year
Very well managed building	0.77 kL/m²/year	0.40 kL/m²/year

Table 10. Water Use Benchmarks[9]

Water consumption (kL/m2/year)	Sydney Water performance benchmarks	NABERS Water rating	
1.80 1.75 1.70 1.65 1.60 1.55 1.50 1.45 1.40 1.35 1.30 1.25 1.20 1.15 1.10 1.05		1 star (1.73) 2 star (1.39) 2.5 star (1.21) 3 star (1.04)	Leak Zone
1.00 0.95 0.90 0.85	Average practice for buildings with cooling towers and no leaks (1.01) Economic best practice for buildings with cooling towers (0.84)	3.5 star (0.87)	Cost effective improvement zone for water cooled buildings
0.80 0.75 0.70	Well managed building with cooling towers (0.77)	4 star (0.70)	Target zone for water cooled buildings
0.65 0.60 0.55 0.45	Average practice for buildings without cooling towers and no leaks (0.64) Economic best practice for buildings without cooling towers (0.47)	4.5 star (0.52)	Cost effective improvement zone for buildings without cooling towers
0.40 0.35	Best practice for buildings without cooling towers (0.40)	5 star (0.35)	Target zone for buildings without water cooled buildings

To effectively compare the performance of your building against these benchmarks, the NABERS rating calculator should be used: www.nabers.com.au/office.aspx.

Table 11. Water Efficiency Labelling and Standards Scheme (WELS) ratings[9]

	Taps	Showerheads	Toilets	Urinals[9]
Rating	Specification (L/min)	Specification (L/min)	Specification (L/average flush)	Specification (L/single stall or L/600 mm of continuous length)
0 Star	> 16	> 16	N/A	> 2.5 serving a single stall or 4.0 for two stalls
1 Star	> 12 and < 16	> 12 and < 16	> 4.5 and < 5.5	< 4.0 serving two stalls or equivalent continuous length[a]
2 Star	> 9.0 and < 12	> 9.0 and < 12	> 4.0 and < 4.5	< 2.5 serving two stalls or equivalent continuous length[a]
3 Star	> 7.5 and < 9	> 7.5 and < 9	> 3.5 and < 4.0	< 2.0 serving two stalls or equivalent continuous length[a]
4 Star	> 6.0 and < 7.5	> 6.0 and < 7.5	> 3.0 and < 3.5	< 1.5 serving two stalls or equivalent continuous length[a]
5 Star	> 4.5 and < 6.0	> 4.5 and < 6.0	> 2.5 and < 3.0	< 1.0 serving two stalls or equivalent continuous length[a]
6 Star	< 4.5	> 4.5 and < 6.0	< 2.5	< 1.0 serving two stalls or equivalent continuous length[b]

[a] must be fitted with demand driven or smart demand operation

[b] must be fitted with demand-driven or smart-demand operation with a urine sensing device

Waste benchmarks

Table 12. Recycling Benchmark

Recycling Data	
Star Rating	**Percentage %**
0 star (not rated)	<25%
1 star	33-26%
1.5 stars	41-34%
2 stars	49-42%
2.5 stars	57-50%
3 stars	65-58%
3.5 stars	73-66%
4 stars	81-74%
4.5 stars	89-82%
5 stars	>90%

NABERS version January 2008[10]

Table 13. Total Materials Generation

Materials (grams/person/day)	
Star Rating	**g/p/d**
0 star	> 550
1 star	500 - 549
1.5 stars	450 - 499
2 stars	400 - 449
2.5 stars	350 - 399
3 stars	300 - 349
3.5 stars	250 - 299
4 stars	200 - 249
4.5 stars	150 - 199
5 stars	< 149

NABERS version January 2008[10]

Note: To effectively compare the performance of your building against these benchmarks, the NABERS rating calculator should be used: www.nabers.com.au/office.aspx.

Step 4: Audit

It is essential to know the types and amounts of energy, water and materials that are being used in your business. An audit of key resources should be conducted to determine the overall resource efficiency of your business and opportunities for savings. The audit type that will be most useful and cost effective to your business depends on the size and complexity of your business and the level of detail you require. Two common audit types are walkthrough audits and engineering audits.

The majority of businesses will only require a simple walk-through audit. If the site/s is complex, then it may be necessary to obtain the help of a professional auditor.

There are Government programs that will help cover the costs of professional audits. See Additional Auditing Assistance below or alternatively contact your energy provider and request a technician do a simple audit of your facilities and equipment.

Before conducting any audit, consider and take any necessary actions to ensure the following are addressed:

- Privacy/confidentiality
- Security
- Occupational Health & Safety
- Resources/volunteers
- Approval from building and contractors

Walk-through audit

A walk-through audit analyses the utility bills and briefly surveys the building. This type of audit will identify potential savings and aid in implementing low cost and no cost improvements as well as planning for longer term capital improvements which merit further investigation.

Goals of walk-through audit:

- Gather basic data on building structure, systems and resource use
- Identify operational or maintenance areas that are wasting resources
- Identify capital projects that can improve efficiency and minimise waste

To conduct a walk-through audit and get a better understanding of your business consumption patterns and opportunities for improvements, follow the basic steps and checklists located in Appendix.

Detailed technical audit

If you prefer not to administer a self walk-through audit or found significant discrepancies between your utility bills and audit estimates that require advanced assessment, you can hire a professional to conduct a detailed technical audit. This type of audit requires an engineer or auditing professional who will provide a detailed assessment of your business resource use and advise on:

- Opportunities to improve operating and maintenance procedures
- Opportunities to utilise alternative sources, resource re-use options within the site and recycling where practical

Additional auditing assistance

Sustainability advantage

Additional efficiency assistance is available through the NSW Department of Environment and Climate Change's (DECC) Sustainability Advantage Program, including audit guidance. This program helps businesses manage their resource use as well as plan and implement sustainability planning in the workplace. Visit the DECC website for additional information on this program: http://www.environment.nsw.gov.au/sustainbus/sustainabilityadvantage.htm

Energy
Sustainability advantage energy saver

The NSW DECC's Sustainability Advantage program also includes an Energy Saver option, which is designed to help mitigate risks relating to the potential increase in energy costs under a national emissions trading scheme, CPRS. Visit the DECC website for more information: http://www.environment.nsw.gov.au/sustainbus/energysaver.htm

Energy efficiency for small business program

The Energy Efficiency for Small Business Program provides assistance to businesses in reducing their energy consumption and costs. The program offers an energy audit and efficiency advice, as well as rebates to businesses wanting to minimise their energy consumption. http://www.environment.nsw.gov.au/sustainbus/smallbusenergy.htm

Greenhouse challenge plus: energy audit tools

The Department of Environment, Water, Heritage and Arts (DEWHA) has developed a series of energy auditing tools for small to medium sized businesses as part of their Greenhouse Challenge Plus Program. Visit their website to download auditing forms.

http://www.environment.gov.au/settlements/challenge/members/energyaudittools.html

Water
Every drop counts

Sydney Water's Every Drop Counts Business Program provides additional water assessment, auditing and efficiency assistance to Sydney Water customers to aid businesses in managing and reducing their water consumption. Visit the following website for additional information on this program:

http://www.sydneywater.com.au/savingwater/InYourBusiness/EDCBusinessProgram.cfm

Waste
Waste Reduction and Purchasing Policy (WRAPP)

Detailed waste auditing information and training is available through the NSW WRAPP program. Visit the following website for additional information on this program: http://www.wrapp.nsw.gov.au

Step 5: Prioritise an action plan

Once an audit has been undertaken, it is important to outline the savings and efficiency potential or goals. This outline will be the practical guide to achieving your resource conservation targets. Whilst not all options are financially viable, outlining them provides an opportunity for assessment over several years.

When planning and documenting resource improvement opportunities identified in the auditing phase, it is important to assign responsibility and a timeframe. Use the following as a guide. The saving action plan is also a good place to record your resource baselines, KPIs and targets – this will help organise and track your current progress and develop future initiatives within one document.

Step 6: Monitor and measure

You can only manage what you can measure. Scheduling regular monitoring and measuring of progress against the designated targets will help assess the effectiveness of your sustainability programs and identify areas that need improvement. It will also highlight any unusual activity or discrepancies in resource use that may require maintenance.

Table 14. Sample Efficiency Savings Action Plan*

Current water usage					
Baseline	KPI	Benchmark/Goal	Target reduction	Actual (kL/day)	Timeframe
30 (2007)	kL/day	22.5 kL/day	25%	28.0 (Jan 09)	12-18 mo
				27.5 (Feb 09)	
				25 (March 2009)	
Water Efficiency Savings Action Plan					
Description		Cost	Savings	Responsibility	Timeframe
Install flow restrictors on taps		$1,500	2kL/day	John Smith	March 2009
Educational signage		$200	N/A	Senior Manager	Feb 2009
Total		**$1,700**	**2kL/day**		
Current energy use					
Baseline	KPI	Benchmark/Goal	Target reduction	Actual (kWh/m^2)	Timeframe
185 (2007)	kWh/m^2	129.5 kWh/m^2	30%	180 (Jan 09)	12-18 mo
				175 (Feb 09)	
				125 (Mar 09)	
Energy Efficiency Savings Action Plan					
Description		Cost	Savings	Responsibility	Timeframe
Efficient lighting in common area		$3,000	50 kWh/m^2	Julia Smith	March 2009
Educational signage		$200	N/A	Senior Manager	Feb 2009
Total		**$3,200**	**50 kWh/m^2**		

*Note: Sample table, not based on actual benchmarks or savings

Step 7: Staff engagement

Staff engagement is critical to the success of any sustainability program and will be a powerful driver to change within the organisation. Implementing the necessary process changes required for sustainability and efficiency improvements in the workplace is dependant on the cooperation and involvement of everyone in the organisation. People are generally willing to contribute to being more sustainable and efficient when they are given the appropriate information on how their actions can make a difference in improving the environment and help the business run more effectively. High commitment levels by senior management help employee commitment and participation in sustainability and efficiency measures.

Suggestions to engage staff and enhance the outcomes of your sustainability efforts:

- Use common areas as forums to inform employees about energy, waste and water savings techniques and company commitment to efficiency
- Look for 'sustainability advocates' in different areas of the organisation to help monitor and implement efficiency measures
- Reward employees for new resource saving ideas
- Inform staff of sustainability 'wins'
- Let your staff and customers know what steps the organisation is making to become more sustainable
- Join Government efficiency programs such as NSW Government Sustainability Advantage Program
- Participate and celebrate national/ international environmental events such as Earth Hour and National Ride to Work Day

Education

Staff education initiatives and easy access to the Where, When and How of your organisation's sustainability program goals will improve the success rate and retention of process changes. A few simple ways to increase education and awareness around the office include:

Signage and communication

- Post best practice signage in key areas such as toilets, kitchens, near copy machines and printers
- Post signs noting the building or sustainability contact that should be notified of leaks or equipment failures
- Examples and templates for signage is available on Sydney Water's website as part of the Every Drop Counts program
- Create a designated area for sustainability updates and information, such as on the company's internal website or information board in break rooms/kitchens
- Regularly communicate sustainability outcomes and wins to the entire company
- Include sustainability updates with all company performance and financial reviews. This will reaffirm the organisation's commitment to sustainability as part of business operations rather than it being seen as a separate program or department
- Create a sustainability newsletter for staff and customers
- Develop a mechanism for staff feedback and ideas for sustainability projects

Internal sustainability team

- Create a sustainability team with members from each major department such as marketing, finance and operations
- Meet regularly with the sustainability team and give updates on project progress as well as brainstorm new initiatives
- Give one or two relevant and manageable sustainability action items to each team member. This will assist in promoting ongoing improvement measures throughout the organisation
- Find other advocates within the organisation who are interested in sustainability to help promote process changes to staff

There may be a few growing pains when implementing processes that require staff to change unsustainable behaviours that they have had for years, but do not let this discourage or derail the company's sustainability efforts. Continuous demonstration of management commitment and gradual adjustments will help to show staff that sustainability measures are important and require a new mindset rather than more effort.

Rewards

Demonstrating of company and management commitment to sustainability measures will go a long way in engaging staff to act sustainably. Providing incentive programs and rewards to employees who actively participate in efficiency and sustainability will help retain process changes and bring more staff members onboard. Examples of reward and incentives:

- Provide a company mug to all employees with 'green' branding
- Provide a reusable carrying bag with the company logo to all employees
- Offer public transportation incentives to employees, i.e., discounts or make travel passes available pre-tax
- Impromptu small rewards, such as movie tickets, to staff who turn off their computer and monitor everyday

Section III: Actioning Sustainability

Energy Efficiency

Improving energy efficiency makes good business sense, both economically and environmentally. Energy efficiency measures can reduce your operating costs as well as reduce carbon emissions contributing to climate change. There are many win-win energy efficiency opportunities that can be implemented in the work place.

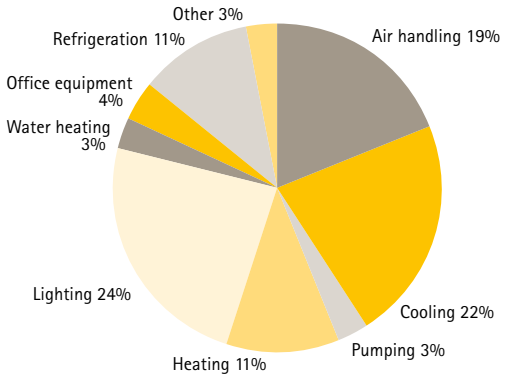


Figure 6. Energy use in Australian commercial sector[11]

Efficiency, efficiency, efficiency... you don't have to pay for what you don't use!

If you do nothing else... following these simple best practice tips

1. Switch off – all energy consuming equipment should be turned off when not in use. Install timers where necessary
2. Fix leaks – repairing dripping taps, showers and toilets will save you money on both water and energy bills
3. Schedule regular maintenance and cleaning of equipment, including, HVAC, kitchens and vehicles
4. Install energy efficient light bulbs
5. Adjust thermostat a few degrees higher in the summer and lower in the winter
6. Print double sided and use electronic documents rather than paper
7. Implement a recycling program (paper, plastic and glass)
8. Install water saving showerheads and taps
9. Engage staff in your sustainability efforts
10. Record and monitor your resource (energy, water and water) use, you can only manage what you can measure

Fast fact:
If energy makes up a quarter of your business costs, then a 20% energy savings reflects a 5% increase in overall profit

Lighting

Artificial lighting makes up a significant portion of electricity consumption in most commercial buildings. There are many cost-effective ways to reduce energy consumption, improve energy efficiency and reduce GHG emissions in existing buildings.

Efficiency replacements

> Replace incandescent light bulbs with energy efficient compact fluorescent light (CFL) bulbs, which use 70% less energy than their incandescent counterparts
> Not to mention incandescent lights will be banned in Australia effective as of 2010, so you'll be ahead of the regulation by making an immediate change
> Replace EXIT signs with light emitting diode (LED) fixtures
> Replace older T-12/T-8 fluorescent lighting fixtures with new slimmer, more energy efficient T-5 models. Easy retrofit conversion kits are also available

Usage

> Turn off lights in areas that are not utilised
> Use task lighting to supplement general lighting
> Utilise natural lighting, keep lights to a minimum during the day in areas that are well lit by sunlight
> Clean lighting fixtures regularly

Sensors and switches

> Label light switches to denote location of lights, aiding in switching off unnecessary lighting
> Avoid having several lights activated by one switch, use separate switches for each light
> Install switch plate occupancy sensors to automatically turn lighting off when no one is present
> Install timers on outside lighting, update timer seasonally

Energy Efficiency

Table 15. Efficient lighting guide[9]

Inefficient lighting	Replacement lighting	Advantages and Disadvantages
Standard fluorescent tubes	T5 fluorescent lights, electronic ballasts and lux reflectors	**Advantages** • lower energy use • slim line • less flicker and buzz • low levels of mercury • white light • long life • low loss of light over lifespan • high output lights available, if needed **Disadvantages** • will require new fittings and ballasts
Incandescent globes	Compact fluorescent globes	**Advantages** • lower energy use • wide range of colours and sizes • long life • will fit existing light sockets • and fittings • dimmable versions now available
Low voltage halogen lights	Compact fluorescent globes designed for recessed and track lighting	**Advantages** • lower energy use • cheaper globes **Disadvantages** • requires new fittings • light output not as strong, may need additional bulbs
Low voltage halogen lights	35 w infrared coated (IRC) lamps	**Advantages** • lower energy use
Low voltage halogen lights	Light emitting diode (LED) lamps	**Advantages** • lower energy use • longer life globes **Disadvantages** • relatively new products, availability limited • more expensive globes

Heating ventilation and air conditioning (HVAC)

Heating and cooling also accounts for a large percentage most businesses' energy bills. Significant energy savings can be made by improving the efficiency of an HVAC system through upgrades, regular maintenance and participating in energy savings programs.

Temperature

> Program HVAC system to automatically turn off after hours and switch back on during operating hours
> In the summer adjust temperature to 23°-25°C
> In the winter adjust temperature to 18°-20°C
> When outside temperatures are 20°-24°C, turn off heating or cooling if possible

Airflow

> Check doors and windows have tight seals
> Keep exterior doors and window closed during cold and hot days to prevent air loss
> Open the windows and turn off system on nice days
> If ducted HVAC system has zoning capability, program to only condition areas that are in use
> If HVAC system does not have zoning capabilities, shut vents in areas that are not in use, note 80% of the vents should remain open while system is operational
> Ensure heat producing equipment is not located near thermostat sensors
> If using a ducted HVAC system ensure furniture, drapes and other items are clear of the vents or outlets to ensure free airflow
> Utilise fans where possible. Fans help circulate air, reducing the need for air conditioning, while remaining a comfortable temperature

Maintenance

> Schedule regular maintenance checks for HVAC equipment
> Perform a pre-season check prior to the winter heating and summer cooling, well maintained systems cost less to run and provides better performance
> For businesses with significant HVAC equipment, it may be worthwhile to have the systems professionally audited for energy usage and efficiency
> Check system is functioning and programmed properly, test temperature settings and airflow

New systems

> When purchasing a new HVAC system, make sure it is the most energy efficient model
> Consult www.energyrating.gov.au for energy efficiency ratings
> Depending on the age and type HVAC system, it may be more cost effective to install new, more efficient equipment prior to the old equipment failing
> When purchasing a new system, be sure it is the appropriate size for your space and use requirements. Systems that are too large or too small will not only waste energy but also increase your energy costs

Energy Efficiency

Did you know:

- Every 1°C increase on the thermostat will increase energy use by about 15% in winter
- Every 1°C decrease on the thermostat will increase energy use by about 10% in summer
- You can save as much as 10% a year on your heating and cooling costs by simply turning the thermostat back by 1°C![12]

Building envelope

Building envelope energy efficiency improvements are important considerations when your facility is being upgraded. Over the life of a building the upfront costs of energy efficiency improvements will frequently pay for themselves through energy savings. In the case of new construction, it is less costly and more efficient to "do it right the first time" rather than make improvements later in the life of the building.

Insulation

- Install insulation in exterior walls, wall cavities and ceilings
- New technology has made the installation of insulation into existing buildings much easier and less expensive
- Install interior blinds/shades to provide additional shade and minimise heating effect of sunlight

Roofing

- Install roof insulation
- Consider radiant barriers and cool roofing that reflects the Sun's radiant energy, and saves money on air conditioning
- Consider installing solar panels

Windows and doors

- Seal gaps around window and doorframes with caulk
- Check window and door weather stripping, replace if missing, cracked or hard
- Close gap under exterior doors if you can see daylight underneath
- Install double or triple pane windows
- Install window glazing, films or tinting
- Insulate window frames

Design

- For a new facility, employ passive solar design and orientation, that is positioning a building to take advantage of the sun's natural heating and light energy as well as shade
- Optimise green interior design techniques to minimise light, heat and cooling needs
- All new building work must comply with the Building Code of Australia energy efficiency provisions

Office equipment

In Australia, office equipment consumes at least 5% of all electricity and directly and indirectly generates 9-11 million tonnes of CO_2 each year. For a typical piece of office equipment, about 85% of the total energy is used during operation mode and active standby mode[11].

General

- Switch off all equipment at the end of the day or when not in use
- Switch off equipment at the wall – most office equipment still uses a small amount of energy even when it's turned off
- Use the 'power save' mode on equipment. By enabling 'power save' or 'Energy Star' setting the equipment goes into "sleep" mode when not in use
- Consider the location of printers, photocopiers and fax machines which produce heat, if these are located near a heating or air conditioning sensor they can lead to over cooling
- Install energy saving software that powers computers down after hours or install timers
- When purchasing new office equipment, look for the Energy Star rating and energy efficiency options

Computers

- Turn off computers and monitors when not in use. A computer monitor uses up to 75% of the energy powering a computer[13]
- Disable screen savers set to 'sleep mode' when a computer is inactive
- Purchase the most energy efficient office equipment, look for Energy Star labelling and ask about the power rating and energy efficiency
- Consider flat screen monitors rather than standard monitors – they are more energy and space efficient
- Consider using laptops rather than desktop computers, they are more energy and materials efficient than desktop computers

Printers/copiers/fax

- Activate energy saving mode on printers/copiers/fax
- When purchasing new copiers/printers/fax, look for models that are the most energy efficient and are programmable to automatically turn off out of business hours
- Consider removing individual printers and utilise all-in-one printer/copiers that are designed for double-sided printing and use of recycled paper
- Also look for models that have toner/ink saving modes
- If copiers/printers warm-up quickly, switch off when not in use
- Print in 'batches.' Make copies all at once rather than multiple smaller batches – each time you start photocopying the machine uses extra energy to get ready to operate

IT equipment

Upgrading IT infrastructure, such as servers, can also be a great way to reduce your electricity requirements and subsequent carbon emissions. The key factors to consider when purchasing new equipment:

- Select the appropriate office and IT equipment for your business needs, both in the short-term and long-term
- Select appropriately sized for your office needs, may need professional assessment
- Select high functioning and multitasking equipment to avoid buying multiple pieces of equipment

Energy Efficiency

Fast fact:

Paper (including toner) is the biggest cost of a photocopier and has the most environmental impact. Be sure to print double-sided, purchase recycled paper and recycle toner cartridges[14]

Water

- Fix leaking taps and showers
- Install water saving taps and showerheads
- If the hot water thermostat is adjustable, turn it down to 55°C
- Promote water and energy conservation through signage and programs such as 'Every drop counts' to encourage employees to conserve water
- Insulate hot water heaters and piping
- Consider installing a solar hot water heater

Kitchens and break rooms

- Only run the dishwasher when full and be sure to use the 'economy' setting
- Check coffeemaker and kettle are not constantly boiling
- Use appropriately sized refrigerators – small bar fridges are huge energy wasters
- Store pitchers of water in the refrigerator instead of using drink dispensers
- Replace microwaves older than 5 years
- Use microwave rather than stove or oven
- For refrigerators, freezers and water coolers, make sure there is a 15cm air-gap between the back of the appliance and wall
- Check refrigerator door seals are tight, if you can easily pull a note out from between the seal and frame on a closed door, replace the seal

Transportation

- Encourage and incentivise staff to utilise public transportation
- Consider purchasing hybrid and diesel vehicles
- Regularly service vehicles
- Keep tyres inflated to correct pressure
- Utilise GPS systems to determine the most efficient route and drive time
- Use telecommunications rather than travelling to meetings
- Encourage and organise carpooling for staff
- Allow staff to work from home periodically

Australian Business Limited Apprentice Centre (ABLAC) – Green Fleet Case Study

ABLAC has significantly reduced its transportation carbon emissions and fuel consumption by purchasing more efficient vehicles and offsetting the carbon emissions. By upgrading 80 vehicles to more fuel efficient models, ABLAC has reduced its carbon emissions by almost 100 tonnes/year and reduced fuel consumption costs by 20%. The remaining carbon emissions have been offset by planting trees through the Green Fleet program.

Water Efficiency

There are plenty of water saving opportunities in the work place. Implementing water saving and efficiency measures will save you money and help Australia conserve its valuable water resources.

Bathrooms

Toilets

- Install dual flush toilets, 6L cisterns with a half flush (3L) option
- Check the back of the toilet bowl; if there are signs of small leaks, get them fixed as a small leak eventuates into a bigger one
- If toilets are connected directly to a flush valve (that is, no cistern) then ensure flush is 5 seconds or less
- Consider reducing the water level of high volume toilets. Note: if cistern is 9L or 13L, do not reduce the water level in the cistern by more than 2L as the bowl is designed to require more water

Hand basins

- Ideal would be a mixer tap (combined hot and cold) with a flow rate of 6L/min and an aerated flow
- Check tap flow rates – more than 10L/min are high flow, wasting unnecessary water
- Whilst sensor taps appear good, they need to switch off within 6 seconds, but generally they waste more water than manual taps
- Install tap aerators, which allows for the sensation of pressure without extra water
- Check hot water temperature has not been set too high

Urinals

- Cistern size should be 7L or less
- Manual urinals generally use less water, although depending on the size of the facility may not always appropriate
- Check sensors are placed directly above the urinal so that people using basins or toilets do not accidentally trigger the sensor
- Some sensors when they fail, fail in the open position, that is, constantly flushing. It is important to check that they switch off by direct observation
- Waterless urinals are available either with a cartridge or cube. If considering this, note that it works best with wall mounted urinals and they still require maintenance, new cleaning regimes and used only in well-ventilated areas

Showers

- Ideal is a 9L aerated showerhead
- If showerhead is greater than 13L/min it should be replaced
- Place water conservation signage in showers, contact Sydney Water Every Drop Counts program
- To get a sense of greater pressure, install aerators to allow air to be pulled in for the pressure sensation

Kitchens

Appliances

- Ideal water devices are labelled under the Water Efficiency Labelling and Standards (WELS) scheme with 6 stars being the highest ranking
- Check dishwashers, washing machines, taps and hot water heaters are rated as high as possible
- Only run dishwashers when full
- Place signage in kitchen reminding staff to conserve water and report leaks

Hot water

- Kettles are the best for boiling water in smaller kitchens as water is not wasted
- Larger water boiler units need to be checked as the overflow valve is often hidden. Once they get old or out of service, they tend to leak more frequently
- Check that hot water heaters are switched off at night, install timer plug if necessary

Fast fact:

Running hot water in the sink for 5 minutes uses the same amount of energy as a 60-watt light bulb burning for 14 hours[15]

Water Efficiency

Cooling towers

In larger complexes, air-conditioning is through cooling towers as opposed to individual electric units. Never conduct personal maintenance of cooling towers as it requires qualified specialists. When approaching cooling towers, always follow safety instructions and the use of a facemask. There are however signs to assess if there are problems between services. These include:

- Check that there is splatter proof guards so that water is contained in the equipment
- Ensure that the overflow pipe outside the cooling tower does not always have water running through it. Whilst it is normal to have some overflow due to high salinity in the water, there should be periods of times when it does not run
- Most towers utilise a float ball valve to signal for more water, check that the internal overflow pipe is not always covered wasting water unnecessarily
- If there is a cooling tower, get a submeter placed on it. Regularly checking how much water is used in the cooling tower is important and may also result in lower fees if you can prove a higher discharge through cooling towers.

Garden areas

Many office environments have either garden areas or water features. Appropriate management is necessary to make the best of the aesthetics while not unnecessarily wasting water.

Water features require regular care and maintenance, check the following:

- Overflow valve is above normal water level
- Water is recycled
- Steps are taken to reduce evaporation

Garden areas with irrigation should be checked for leakage. Irrigation cycles should be changed during the year depending on the season and should be checked that they are not automatically switching on every evening.

Water harvesting

Installing a rainwater or stormwater harvesting system requires a specialist for approval and installation. Local councils generally have individual rules for the use of harvested water in business premises and it could be that water use is restricted to garden and outdoor areas. Internal plumbing requires a qualified technician and appropriate sizing. Generally speaking, harvesting systems require significant roof area for appropriate use and despite this, have long payback periods.

Recycling

Technologies in recycling are vastly improving; however their cost is still a hindrance. There are several types of recycling mechanisms:

- Greywater – which is recycling water from sinks (not in the kitchen) and showers
- Black water – which is recycling of water which contains organics

Recycling systems are best implemented in new buildings, as converting existing office spaces to allow for it is very expensive.

Fact sheets

Sydney Water's Every Drop Counts Business Program has a number of fact sheets suitable to assist office spaces become more water efficient.

CASE STUDY

Ramm Botanicals water conservation

Ramm Botanicals participated in a water conservation program led by Wyong Council which targeted a 24% reduction in water use. Through a combination of installing rainwater tanks and changing their plant product offerings to a range of water-wise Australian native plants, Ramm Botanicals was able to exceed the Council goal and achieve a 54% reduction in their town water use. They capture 3/4 of their water needs through the rainwater tanks and minimise water intensity by specialising in plants that are adapted to Australia's dry climate. These measures create valuable long-term water savings for their business and also for customers who landscape with native plant species. www.ramm.com.au

Resource Efficiency and Waste Reduction

Reducing resource consumption and waste generated from your company are essential components of improving your organisation's sustainability. Improving resource efficiency will conserve energy and reduce carbon emissions, as well as save your business money.

Monitoring and management of materials and waste generation will also help improve the overall efficiency of your organisation through minimisation of time and money spent on purchasing and removal of materials. The savings from waste reduction can be used to develop and enhance your business rather than being thrown out with the garbage.

Waste and resource reduction measures will:

- Save money
- Improve efficiency
- Reduce natural resource consumption
- Reduce carbon emissions

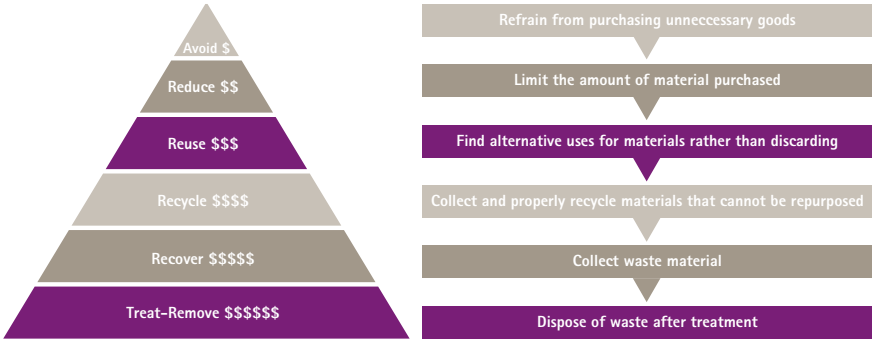
Waste avoidance and reduction

Paper

- Think before you print. Do you really need a printout of that document?
- Set all computers in your office to automatically print double-sided
- Suggest using the "Two-Up" option when printing (prints in a booklet style, 2 pages per sheet of paper) in addition to double-sided printing. This combined with double-sided printing will use 75% less paper alone!
- If you can't print double-sided, consider printing two sheets to a page (two-up)
- Set electronic templates to a smaller font with larger margins
- Calculate how many reams per person are used and let staff know about ways to reduce this number

Figure 7. Waste hierarchy

The best opportunities to save money – Avoid and Reduce waste from the start



Electronic communication

- Send electronic communications rather than paper
- Ask suppliers to send electronic communications and invoices
- Send electronic invoices and communications to your customers

Mailing lists

- Remove duplicate names and out-of-date entries from mailing lists and consider electronic communications instead
- Take steps to reduce unsolicited mail
- Design mailers which avoid the use of envelopes (fold and staple the paper)
- Use electronic mail and voice mail rather than mailers

Reuse

- Reuse paper that has only been printed on one side
- Reuse envelopes by placing a label over the old address
- Use reusable envelopes for interoffice mail
- Use outdated letterhead for in-house memos and copies
- Reuse file folders
- Reuse cartons for shipping
- Shred newspapers and reuse for packaging

Recycling

- If you don't already have recycling available in your office, contact your waste contractor about recycling options
- Use waste audit outcomes to determine which materials are the highest priority to recycle and reuse
- If you currently have only paper recycling, contact your waste provider to discuss a commingled recycling service which allows other materials such as plastic and metal in the same bin
- Replace trash bins at individual desks with a combined recycle bin and utilise a central waste bin. This will help remind staff to recycle more and waste less
- If your office is small, consider combining your recyclables with other small offices nearby
- Provide clearly labelled recycling bins around the office, especially in kitchen and break rooms

Resource Efficiency and Waste Reduction

Office supplies

Purchasing policy

> Establish a purchasing policy that favours environmentally-preferred products and supplies and includes efficiency in all purchasing decisions
> Include a clause in major purchases that requires suppliers to take away packaging (such as, polystyrene and cardboard)

General

> Review office supply orders for unnecessary or duplicate items
> Provide a communal location for office supplies that are used infrequently rather than purchasing individual supplies for each individual

Paper

> Buy recycled office paper and stationary
> Look for carbon neutral paper and stationary

Toners and ink cartridges

> Recycle and/or refill toner and ink cartridges
> Use vegetable-based inks when printing

Office equipment

> Purchasing energy efficient equipment, see www.energyrating.gov.au for energy efficiency ratings
> Consider upgrading to an all-in-one copier/printer, eliminating the need for multiple smaller printers
> Rent equipment used infrequently
> Dispose of old equipment responsibly, look for recycling options

Fast fact[12]:

Each tonne of paper that is recycled saves:

> Almost 13 trees
> 2.5 barrels of oil
> 4100 kWh of electricity
> 4 cubic metres of landfill
> 31,780 litres of water

Kitchen

> Provide reusable mugs and utensils to employees and clients rather than using paper or polystyrene cups and disposable wooden or plastic stirrers
> Buy in bulk to minimise packaging with items like coffee, tea, sugar, paper, pens and notebooks
> Avoid buying sachets of sugar and coffee, use a canister instead
> Provide cloth towels in kitchen and restrooms rather than using paper towels
> If disposable items are required, be sure to buy those that are made from recycled and biodegradable materials

Customers

> When promoting your business carefully select useful giveaways to avoid throw away trinkets
> Minimise the use and distribution of plastic bags
> Let customers know your efforts to minimise waste

Cleaning supplies

> Use environmentally friendly cleaning products, phosphate free and biodegradable
> Involve cleaners in all company sustainability discussions and forums, their cooperation is critical
> Consider composting and worm farms for kitchen waste if you have a garden available

Building design and renovations

> When building or renovating your facility, utilise low waste contractors who specialise in reuse of materials and reconstruction instead of demolition
> Create a waste management plan with the contractor prior to construction to ensure waste reduction measures are convenient and adhered to
> Donate old office furniture rather than sending to the landfill
> Use recycled materials for construction
> Use environmentally friendly materials such as paint, furniture, finishings and flooring

Case Study:
Australian Business Limited Apprentice Centre (ABLAC) – paper and resource efficiency

In an effort to minimise paper consumption and increase resource efficiency, ABLAC implemented a scanning system for tracking documents. The electronic system replaced a manual paper system and has significantly improved processing time and labour efficiency. The savings benefits include waste and paper reduction as well as cost savings. The new electronic system reduced paper consumption by 30,000 sheets and the equivalent of $100K in salary by being able to process more with the same number of staff.

Section IV: Next Steps

Supply Chain

All businesses rely on their supply base and customers to survive. Integrating sustainability principles into purchasing decisions and managing your supply chain from a sustainability perspective are key steps to achieving overall sustainability for your business. Supply chain management considers the interactions between a business and its customers and suppliers. Incorporating sustainability into your supply chain involves reviewing your purchasing and production decisions from both social and environmental perspectives in addition to the economic considerations. Supply chain management extends as far as possible 'upstream' towards raw materials and supply purchases to 'downstream' towards the consumer and then back again for product disposal and recycling.

Sustainable procurement policy

Development of a procurement policy can be an effective step in managing the sustainability of your supply chain. It can also provide economic benefits as many large corporations and government departments require documentation of sustainability or environmental management initiatives for tendering. Additional benefits to sustainable supply chain management and procurement include:

- Reduced costs and increased productivity
- Reduced financial, regulatory and reputation risks
- Incentive to producers to develop new sustainable products
- Competitive advantage in new and expanding markets for sustainable products
- Meeting the expectations of the shareholders, community and customers

Businesses with complex supply chains may want to take further action up and down their supply chain by developing a 'Code of Conduct.' This document outlines the social and environmental principles and standards that the company, contractors and suppliers are expected to observe. Implementation of a Code of Conduct will also require monitoring and evaluation of the sustainability practices of companies within your supply chain.

Visit the NSW Government Green Goods website for more information on developing a sustainable procurement policy. http://www.greengoods.nsw.gov.au/policy/keyactions.htm

Taking It To The Next Level

Efficiency first

Improving efficiency is the simplest and most cost effective way to reduce carbon emissions and save money on utility bills. Taking advantage of opportunities to minimise consumption in all areas of your business, whether it be energy, water, supplies or paper can significantly reduce negative environmental impacts and help your business prepare for the transition into a low-carbon economy.

Once you have addressed the immediate efficiency savings opportunities, the next big step is to assess larger projects outlined in your energy savings plan. For most businesses, significant energy efficiency savings can be obtained through investments in newer, more efficient equipment and building upgrades. To determine which investments to make first, look at the most energy intensive and oldest equipment in your facility. The key areas to consider are:

- Heating, air conditioning and ventilation systems
- Lighting
- Insulation
- Office equipment
- Refrigeration (if applicable)

See 'Funding' section for grants and assistance programs that may be able to provide financial support for efficiency upgrades for your business.

Renewable energy

Once you have addressed the energy efficiency opportunities available in your business, you may want to consider converting to a 'green power' or renewable energy. Renewable energy is electricity supplied by wind, solar, geothermal, hydro and biomass, these sources are considered continuously renewable. These types of electricity emit very low levels of GHG emissions compared to traditional fossil fuel electricity such as coal.

Renewable energy can be provided by installing equipment such as solar panels on your building or alternatively can be purchased from your energy provider rather than fossil fuel electricity. Purchasing renewable energy can be more expensive than traditional fossil fuel based electricity, so it is important to address energy efficiency measures to minimise your utility bills. For more information on renewable energy, visit the Government's accredited green power website at www.greenpower.gov.au

Carbon offsetting

A **carbon offset** is a purchased 'credit' that represents a reduction in greenhouse gas emissions. Carbon offsets are generated through emissions-reducing or energy efficiency projects such as tree planting or renewable energy. The amount of carbon emissions 'saved' through these projects is calculated and then sold as offset credits to businesses or individuals to mitigate carbon emissions from various activities such as transportation and electricity use. There are two types of carbon offsets, those purchased by large industries in order to comply with emissions reduction regulation and voluntary offsets purchased by businesses, individuals and governments to meet their emission reduction goals.

Carbon offset products are largely an unregulated market, so it is important to look for accredited providers to ensure that offsets are actually reducing carbon emissions. In Australia, there are a few government mechanisms currently available to assure customers of the quality of offsets they are purchasing. For more information on carbon offsets, visit the Department of Climate Change Greenhouse Friendly program website at: http://www.climatechange.gov.au/greenhousefriendly/

Whilst purchasing carbon offsets is an effective tool in managing the carbon emissions of your business, it is only one aspect of reducing your company's carbon emissions. Implementing efficiency programs and initiatives to avoid and reduce carbon emissions in the first place is a critical step prior to investing in carbon offsets. Higher efficiency will also reduce the amount of offsets required, saving you money overall.

Carbon neutral

A growing number of businesses are becoming 'carbon neutral' as a way of demonstrating their commitment to sustainability at the highest level. Becoming carbon neutral means achieving net zero carbon emissions by balancing the emissions produced by a business with the equivalent amount of carbon offsets, carbon sequestering projects or renewable energy. The benefits to becoming carbon neutral include:

- Risk reduction in the transition to a low-carbon economy
- Considered market leader in sustainability
- Increased marketability, meeting consumer demand for carbon neutral products and businesses

In order to become carbon neutral, the carbon footprint of your business must be determined. Carbon footprint is a measure of the total amount of carbon equivalent emissions generated by your business activities, both directly (onsite and internally produced emissions) and indirectly (offsite and externally produced emissions such as those resulting up and down the supply chain). This process requires a life cycle analysis (LCA) of your business operations and products to ensure all critical components are accounted for in the carbon footprint. An LCA assesses the environmental impacts associated with products, processes and services throughout its life cycle, from the extraction of the raw materials through to processing, transport, use, reuse, recycling or disposal. LCA's require specific and well researched information and may be quite resource intensive depending on the nature of your business and could require an external consultant.

Once your organisation's carbon emissions have been determined via an LCA and carbon footprint calculation, the next steps to becoming carbon neutral typically include:

- Limiting energy usage and improving energy efficiency in all areas of your business
- Using renewable energy, either purchasing green power or generating it directly such as wind or solar power
- Purchasing carbon offsets for emissions that cannot be avoided through efficiency measures or a carbon reduction project
- Optional but recommended, become accredited by a carbon neutral certification provider

Continuous Improvement

Sustainability is a journey that does not end with the installation of lighting motion detectors or recycling, it is a continuous process throughout the life of your business. No matter how efficient or innovative your organisation becomes, there will always be developments and new technologies that will be able to further the sustainability of your business. Sustainability should be viewed as a continuous process rather than a destination. This mindset will help position your business to always seek process and efficiency improvements, positively influence and educate staff and customers, save time and money while also preserving the environment and reducing carbon emissions.

Section V: Additional Information

Legislation

Australian environmental, emission and energy regulations are some of the fastest growing areas of the legal system in both scope and complexity. The majority of these regulations do not directly impact all businesses as they focus on large corporations and industries. However, it is important to be informed about new and changing regulations as there will likely be indirect impacts for all Australian businesses and individuals.

For more information on the growth of environmental law and its impacts on business owners and operators, visit the NSW Business Chamber's website and review 'The Challenge of Green Tape' publication.

Carbon Pollution Reduction Scheme (CPRS)

The Carbon Pollution Reduction Scheme (CPRS), otherwise known as 'emissions trading' or the 'green paper' is the Federal Governments' response to climate change.

The CPRS aims to reduce carbon emissions through a Government regulated system that encourages energy efficiency by establishing a cost disadvantage for heavy pollution.

The scheme is essentially a cap and trade scheme that is targeted to reduce Australia's carbon emissions between 5 per cent and 15 per cent below 2000 levels by the end 2020. The cap achieves the environmental outcome of reducing carbon pollution. The ability to trade ensures carbon pollution is reduced at the lowest possible cost. When that cap is set, parties are able to trade within that cap.

Whilst the CPRS is mainly targeted at the largest 1000 businesses in Australia, the effects will be felt by all businesses. The most likely impacts include:

- Increases in energy prices between 15 and 50%
- Government regulation – potentially covering energy efficiency and type of energy sources
- Corporate regulation – a requirement to be 'green' for tendering
- Supply chain dynamics – purchasing of supplies, particularly raw materials may become more expensive
- Consumer demands – purchasing only environmentally sensitive products

Thus, it is important to start early and make small but gradual changes to processes. Prepare early to maximise the opportunities in the transition to a carbon-constrained economy whilst simultaneously saving on the bottom line.

National Greenhouse and Energy Reporting System (NGERS)

The National Greenhouse and Energy Reporting System (NGERS) is a mandatory reporting system that requires corporations that either produce or consume large amounts of energy to report their energy and greenhouse gas emissions to the Government. Reporting requirements include corporate groups that either consume or produce 500TJ of energy and/or produce 125 kt of CO_2-e and facilities that either consume or produce 100TJ of energy and/or produce 25 kt of CO_2-e. This reporting system will be used to inform the 'cap' levels for the Carbon Pollution Reduction Scheme (CPRS).

Greenhouse Gas Reduction Scheme (GGAS)

The NSW Government has indicated that Greenhouse Gas Reduction Scheme (GGAS) will cease on the commencement of the national emissions trading scheme, CPRS. The energy efficiency component of GGAS will continue with new targets being set mid year 2009. The new scheme will require electricity retailers to pursue additional energy efficiency improvements in households and businesses.

NSW Energy Efficiency Trading Scheme (NEET)

NSW Energy Efficiency Trading Scheme is an energy efficiency package aimed at reducing power use and cutting the state's greenhouse gas emissions. It is a market-based incentive for energy efficiency. Compliance obligations under NEET will rest with electricity retailers. This scheme will revitalise the existing energy efficiency component of the GGAS. The scheme is due to start on 1 July 2009.

Minimum Energy Performance Standards (MEPS) – Lighting

In February 2007, Government's phase-out of inefficient incandescent lamps was announced. The phase-out of incandescent lighting aims to significantly reduce Australia's greenhouse gas emissions and places Australia at the forefront of international efforts to tackle climate change.

This initiative will be implemented by introducing MEPS for incandescent lamps, in order to remove the poorest performing products from the Australian marketplace between 2008 and 2015. Additionally, MEPS for compact fluorescent lamps (CFLs) will also be introduced to ensure that only high quality CFLs are sold in Australia. For more information and specific timing to the phase-out visit, www.environment.gov.au and www.energyrating.gov.au/reg.html

Funding Opportunities

There are some excellent funding opportunities to manage climate change, whether it is to clean up production processes or install efficient lights. The Government is providing plenty of opportunities to help your business become more sustainable.

Green Business Program

The NSW Green Business Program is a competitive fund supporting businesses that reduce water and energy usage. It has been available for a number of years to NSW businesses and supports any project that will ultimately save either/both water and energy.

Energy Efficiency for Small Businesses Program

The NSW Department of Environment and Climate Change's new Energy Efficiency for Small Business Program is available to businesses that use up to $20,000 in electricity a year. To sign up for the Energy Efficiency for Small Business Program or for more information contact Business Partnerships at 1300 361 967 or email sustainbus@environment.nsw.gov.au

Climate Ready Program

The Climate Ready program is a competitive grants program providing grants from $50,000 up to $5m on a matching funding basis to support research and development, proof-of-concept and early-stage commercialisation activities to develop solutions to climate change challenges. This program is also being administered through AusIndustry.

Green Building Fund

The Green Building Fund initiative is designed to help Australian businesses implement cost saving energy efficiency measures through retrofitting and retro-commissioning of existing commercial office buildings. The program will also provide financial support to relevant industry associations and other non-government organisations for building related efficiency and skill training.

Renewable Energy Development Fund

The Renewable Energy Development Program under the NSW Climate Change Fund provides $40 million over five years to support projects which are expected to lead to large scale greenhouse gas emission savings in NSW by: either demonstrating renewable energy technologies in NSW or supporting the early commercialisation of renewable energy technologies in NSW.

Renewable Energy Equity Fund

The REEF program is a specialist renewable energy equity fund based on the Innovation Investment Fund (IIF) model. It provides venture capital (equity) to assist small companies to commercialise R&D in renewable energy technologies.

Low Emissions Technology and Abatement

The Low Emissions Technology and Abatement (LETA) initiative is a $26.9 million measure to reduce greenhouse gas emissions over the longer term by supporting the identification and implementation of cost effective abatement opportunities and the uptake of small scale low emission technologies in business, industry and local communities.

Re-tooling for climate change

This is the Federal Government's $75 million Re-tooling for Climate Change grants program with grants for small and medium sized manufacturers ranging from $10,000 to $500,000 to help manufactures reduce the environmental impact of their production processes. It is being administered through the AusIndustry.

Public Facilities Program

The Public Facilities Program under the NSW Climate Change Fund provides $30 million for water and energy saving projects in facilities which are open to, and frequently accessed by, the public including schools, community buildings, sporting facilities, museums and art galleries.

Enterprise Connect

Enterprise Connect provides comprehensive support to Australian small and medium sized enterprises (SMEs), to help them become more innovative, efficient and competitive. www.enterpriseconnect.gov.au

Export Market Development Grants

The Export Market Development Grants (EMDG) scheme offers financial assistance for aspiring and current exporters. Administered by Austrade, the scheme supports a wide range of industry sectors and products, including inbound tourism and the export of intellectual property and know-how outside Australia. To access the scheme for the first time, businesses need to have spent $15,000 over two years on eligible export marketing expenses. The Export Market Development Grants program:

- Encourages small and medium sized Australian businesses to develop export markets
- Reimburses up to 50 per cent of expenses incurred on eligible export promotion activities, above a $15,000 threshold
- Provides up to seven grants to each eligible applicant

Government Programs

There is a wealth of information available through Government should you wish to pursue further information.

Department of Environment and Climate Change
www.environment.nsw.gov.au

Department of Environment and Climate Change Sustainable Advantage Program
www.environment.nsw.gov.au/sustainbus/sustainabilityadvantage.htm

Australian Government Department of Environment, Water, Heritage and Arts
www.environment.gov.au

Australian Government Department of Climate Change
www.climatechange.gov.au

AusIndustry and Climate Ready
www.ausindustry.gov.au

Energy Star Australia
www.energystar.gov.au

Sustainability Victoria
www.sustainability.vic.gov.au

Other Australian resources:

Sydney Water
www.sydneywater.com.au

Green Building Council Australia
www.gbca.org.au

National Australia Built Environment Rating System (NABERS)
www.nabers.com.au

International websites:

Intergovernmental Panel on Climate Change
www.ipcc.ch

Carbon Trust (UK) (see publications and resources)
www.carbontrust.co.uk

Energy Star (US)
www.energystar.gov

Complementary Information

Available on the NSWBC website includes:

1. Top 10 tips for being efficient
2. CPRS fact sheets
3. CPRS survey results
4. What is means to be green
5. Podcasts

Glossary

Adaptation – initiatives and measures to reduce the vulnerability of natural and human systems against climate change effects.

Base building – central services and common areas of a building.

Baseline – assessment conducted in order to determine the current resource use of an organisation, specifically for energy, water and waste. The baseline assessment is used to determine how effective various aspects of an action plan have been in terms of improving resource efficiencies.

Carbon dioxide equivalent (CO_2 – e) – the universal unit of measurement used to indicate the global warming potential (GWP) of each of the 6 greenhouse gases. It is used to evaluate the impacts of different greenhouse gases.

Carbon neutral – a term used when an organisation has reduced the net amount of carbon dioxide equivalent it emits to zero.

Carbon offset – a financial instrument that represents a reduction in greenhouse gas emissions, typically converted to the carbon equivalent. Carbon offsets are generated through emissions-reducing or energy efficiency projects such as tree planting or renewable energy.

Global warming – progressive gradual rise of the Earth's surface temperature thought to be caused by the greenhouse effect and responsible for changes in global climate patterns.

Global Warming Potential (GWP) – index that compares the relative potential of the 6 greenhouse gases to contribute to global warming, i.e., the additional heat/energy which is retained in the Earth's ecosystem through the release of this gas into the atmosphere. Carbon dioxide (CO_2) has been designated a GWP of 1 and Methane (CH_4) has a GWP of 23.

Green power – generic name given to electricity generated from clean and renewable energy sources. Green power sources can include solar (photovoltaic and thermal), wind power, new hydro on existing dams, biomass, wave energy, landfill gas, etc.

Greenhouse effect – the absorption of solar energy due to accumulation of greenhouse gases in the atmosphere.

Greenhouse gases (GHGs) – gases regulated under the Kyoto Protocol, determined to be the main contributors to the enhanced greenhouse effect. The principle gases are carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF_6).

Key performance indicators (KPIs) – an information tool used to measure trends and progress. Indicators provide a snapshot of a current situation and the means to observe changes over time. Example, energy usage for a unit of production (kWh/product).

Kyoto Protocol – specifies the level of emissions reductions, deadlines and methodologies that signatory countries are to achieve. Kyoto Protocol was ratified by Australia in 2007.

Life cycle assessment – determines the total quantities of resources that go into products from the production of their inputs to the waste they produce when disposed or recycled.

Mitigation – actions to reduce greenhouse gas emissions and to enhance carbon sinks aimed at reducing the extent of global warming.

Renewable energy – electricity generated from low or no-emission sources that are indefinitely renewable, such as wind, hydro and solar.

Sustainability – form of progress, process or development that meets the needs of the present without compromising the ability of future generations to meet their needs.

Sustainable development – development that meets the needs of the present without compromising the ability of future generations to meet their own needs. (Brundtland Report 1987)

Tenancy – Office space within a building covering tenant light and power only. This may include tenancy air-conditioning if this has been installed to service particular tenant loads, but does not include central services normally provided by the landlord.

Triple bottom line (TBL) – takes into account the effects a business's activities on the environment and society as well as on the conventional economic bottom line. An underpinning concept of sustainability and sustainable development

Whole building –includes all energy entering the building used for providing services to the occupants of the space.

Note: Website references current as of March 2009

Appendix

Walk-through audits

To conduct a walk-through audit and get a better understanding of your business's consumption patterns and opportunities for improvements, follow the basic steps below.

Step 1: Establish baseline and KPI

Prior to the physical audit of the site, determine your business's resource use via historical/current utility bills and establish a baseline for water, energy and waste. Convert baseline into KPI units.

Step 2: Information gathering

Prior to the physical audit of the site, obtain or draw the building floor plan and mark the location of sources of energy, water and waste disposal. This will help you map out where resources are most necessary and identify areas of inefficiency, such as constant lighting in rooms that are infrequently used.

Step 3: Building management assistance

Prior to the physical audit of the site, meet with the building operations and maintenance personnel to discuss the audit and learn about the building's operating systems and maintenance projects. One of the objectives of an audit is to provide information that will help the building operations personnel run the facilities more efficiently. Therefore, it is recommended you invite the building operations personnel to participate in the walk-through audit. The operations staff will also be able to fill you in on maintenance practices and any issues with the building. Developing a good working relationship with the building operations personnel is important to getting the most out of the audit and identifying additional savings opportunities.

Step 4: Conducting an audit

The next step is to conduct a walk-through survey with building operations personnel. Use direct observation and measurements to complete the enclosed audit checklists as you survey the facilities. Identify and record all pieces of equipment that use water and/or energy.

As you walk through the premises, be sure to take notes of any outstanding questions or areas that need follow-up information or expertise. Discuss the feasibility and opportunities for efficiency improvements with the building personnel as you go through the building, this will help you develop a savings opportunity plan after the audit is complete. **Do not** tamper with or adjust any control settings or equipment, leave this to the professionals.

Please note, the enclosed checklists do not include every single detail which can be included in an audit; rather they aim to identify the largest energy, water and waste areas as well as provide alternative solutions to improve efficiency.

Offices: Energy walk-through audit checklist

Office size: _____ m^2

Operating hours: _____

Number of employees:_____

Baseline energy use per annum: _____kWh

Baseline energy use KPI: _____ kWh/m^2/year

List energy using equipment and number: (Examples: computers, printers, copiers, refrigerators, etc)

Other instructions:

1. Mark the location of equipment, fixtures and amenities that need repair or maintenance on site plan
2. Note areas or equipment that require follow-up investigation, such as energy efficiency upgrades of lighting or HVAC system.

Administration and communication					
Check list		Y/N	Units (no., type)	Suggested follow-up action	Responsibility
Communication and policy initiatives	Has the critical need to be more energy efficient been broadly communicated within your business?			> Develop and post commitment policy statement > Implement employee education and engagement programs	
	Has a management team been organised to provide strategy and leadership around energy efficiency?			> Create sustainability team involving senior management > Include sustainability measures in business strategy development	
	Has an energy management plan or savings plan been developed?			> After audit, develop an immediate and long-term energy savings plan. See Table 15	
	Have internal policies and procedures been developed around energy efficiency and management?			> Use the audit findings to develop policies and procedures addressing the most critical and immediate energy efficiency measures	
Employee engagement	Are energy conservation/efficiency posters displayed throughout the organisation?			> Display signage reminding staff to switch off equipment and lights	
	Are reward/acknowledgement programs provided for employees who conserve energy?			> Develop engagement and rewards programs for staff	
	Are employees provided education around energy efficiency?			> Include energy efficiency training at staff meetings and provide information in public areas such as bulletin boards and internal website	
	Are employees provided regular updates on energy usage and progress towards energy savings?			> Provide energy savings progress reports to staff	
Energy tracking	Is energy usage regularly metered, monitored and recorded?			> Record energy usage and spending when a bill is received > Determine baseline energy use	
	Is energy use benchmarked against industry best practice?			> After baseline is determined, benchmark against industry standard > Alternatively, calculate energy rating via NABERS website	
	Have energy savings targets been set?			> After baseline and benchmarks are determined, set target savings against industry standard	

	Are energy costs and program performance included in financial and business reviews?			> Add energy performance to financial reviews and updates	
Energy billing	Do you know your electricity costs associated with both use (kWh) and demand (kW)?			> Review and record energy data for every bill received	
	On an annual basis, are energy rates and supplier reviewed to ensure the most favourable rate structure?			> Include energy review at the end of reach financial year	
	Are monthly energy bills reviewed for accuracy?			> Double check energy usage vs cost when recording energy activity for each bill > Check and record meter readings if possible	
Lighting					
Check list		Y/N	Units (no., type)	Suggested follow-up action	Responsibility
Lighting use	Are lights turned off when rooms or areas are not occupied?			> Post signage reminding staff to switch off lights > Install occupancy sensors	
	Are light switches labelled to denote location of lighting?			> Label light switches with corresponding lighting area	
	Have energy conservation stickers been placed on light switches?			> Place energy saving reminders on light switches	
	Are lighting systems wired so that lights throughout a large area do not have to be on when only a small section of the area is being used?			> Consider rewiring to separate switches > When remodelling, wire lights to separate switches	
	Is task lighting used to reduce background or overhead lighting?			> Provide energy efficient desk lamps and reduce overhead lighting	
	Have occupancy sensors been installed in areas that are frequently unoccupied (bathrooms, conference rooms, storage rooms, hallways, etc)?			> Install occupancy sensors in key areas	
	Have timers been installed on outside lighting?			> Install timers to outside lighting or use solar lighting	
	Has housekeeping and security staff been advised to keep lights turned off in unoccupied spaces?			> Remind security and housekeeping staff of energy saving measures and that lights should remain off after hours	
Lighting types	Have older lighting fixtures been upgraded or converted to T-5 lamps and electronic ballasts?			> Install or convert old lighting fixtures to more energy efficient models	
	Have incandescent light bulbs been replaced with compact fluorescent light bulbs (CFLs)?			> Replace all lights with CFL or more energy efficient models. See Table 16	
	Do EXIT signs use light emitting diode (LED) fixtures?			> Install LED fixtures to all EXIT signs	
	Has unnecessary lighting been removed or disconnected, both indoor and outdoor?			> Review lighting needs and eliminate unnecessary lights in all areas of building	
	Has unnecessary lighting been removed from vending machines?			> Disconnect lights in vending machines > Install timer plug in for all vending machines to switch off out of business hours	
Cleanliness and maintenance	Are lamps regularly cleaned?			> Remind housekeeping staff to regularly clean all light fixtures	

	Are broken lamps repaired?			> Notify maintenance staff of any lamps that need to be repaired > Post signage reminding staff to report damaged lamps	
	Have non-working lights been replaced?			> Notify maintenance staff of any lamps that need to be changed out > Post signage reminding staff to report non-working lamps	
Heating, Ventilation, Air Conditioning (HVAC)					
Check list		Y/N	Units (no., type)	Suggested follow-up action	Responsibility
Maintenance	Is there a service contract agreement to provide regular safety and efficiency maintenance to the systems?			> Contract regular maintenance to HVAC systems	
	Are systems regularly cleaned and filters replaced?			> Schedule regular HVAC maintenance	
	Have leaks in system components such as pipes, steam traps and couplings been repaired?			> Schedule repairs with maintenance staff	
	Are thermostats regularly calibrated?			> Regularly calibrate HVAC system and investigate/repair any abnormalities	
	Are exhaust fans turned off with the HVAC systems when space is unoccupied?			> Program all available components of HVAC to be turned off out of business hours	
Settings	Are heating and air conditioning thermostats set to the most efficient and comfortable level?			> Set thermostat to: > Summer: 23°-25°c > Winter: 18°-20°c	
	Does system have thermostat sensors?			> If no, install sensors in main work areas and way from heat or draughts > If yes, check to ensure sensors are placed away from heat sources and draughts	
	Are thermostats tamper proof?			> Place covers over thermostats to prevent staff from unnecessarily adjusting temperature	
	Does HVAC system have a timer or programmable?			> Install or set timer to shut off system out of operating hours > Install or set timer for portable systems	
	Is HVAC system setback when building is unoccupied?			> Program HVAC to switch off out of business hours	
	Is air conditioning and heating setback when weather permits?			> Program HVAC to switch off when outside temperature permits	
Airflow	Has supply air been adjusted to match space requirements?			> Calibrate airflow > Decrease flow in areas that are over conditioned	
	Are air deflectors installed on floor ducts?			> If no, install air deflectors to force air into the centre of the room	
	Are doors fitted with automatic door closers?			> Install door closers to prevent heat/cool air escape and drafts	
	Has direct conditioning of unoccupied areas (corridors, stairwells, storage rooms, etc) been minimised?			> Program HVAC to be switched off or close vents in unoccupied areas	
	Are outside air dampers controlled to close when conditioned space in unoccupied?			> Program all components of HVAC to most energy efficient and savings settings	

	If economisers are available on HVAC system, are they set to utilise free cooling when outside temperate permits?			> Program all components of HVAC to most energy efficient and savings settings	
Location	Is heat producing equipment such as printers, copiers and refrigerators located away from HVAC thermostat sensors?			> Move any heat producing equipment away from HVAC sensors	
Water use and heating					
Check list		Y/N	Units (no., type)	Suggested follow-up action	Responsibility
Settings	Is hot water heater set to the minimum level necessary for sanitation requirements?			> Reduce hot water heater to minimum temperature permitted for your business needs > Consider installing a solar hot water heater	
	Are aerator taps and efficient shower heads installed?			> Install WELS aerated taps and showerheads	
	Are timers installed to switch off water heater when facilities are unoccupied?			> Install timer to switch off hot water heaters out of hours and switch back on before opening	
Insulation	Are the hot heaters and first 1-2 meters of piping insulated?			> Insulate hot water heaters and piping	
Maintenance	Have leaks been identified and repaired?			> Schedule regular maintenance inspections for leaks and repairs	
Communication	Is water conservation signage located throughout facility?			> Post water savings and leak reporting reminder signage with maintenance contact info in kitchens, toilets and break rooms > Sydney Water has examples	
Refrigeration					
Check list		Y/N	Units (no., type)	Suggested follow-up action	Responsibility
Maintenance	Are refrigerator doors and seals in proper condition to close tightly without leaks?			> To test, if you can easily remove a note from between the seal and frame, the seal needs to be replaced > If the seal is cracked or separated it should be replaced	
	Are refrigerator coils clean and dust free?			> Regularly clean and maintain refrigerator equipment	
	Is the freezer frost free?			> Defrost any ice build up	
Location	Are fans and equipment unobstructed?			> Make sure there is a 15 cm gap between the wall and the back of the refrigerator	
Settings	Are refrigerators set to most efficient temperature?			> Increase temperature to avoid over cooling and freezing	
	Are timers installed to switch off appropriate refrigerators when facilities are unoccupied?			> Install timer plug ins on all appropriate refrigerators (those that contain non-perishables such as bottled drinks) to turn off after hours and back on prior to opening	
Equipment	Are refrigerators most energy efficient models?			> If refrigerators are older inefficient models, consider upgrading to hight Energy Star rated	
	Are refrigerators appropriately sized for facility needs? Example, 2 larger refrigerators rather than 4 mini-refrigerators.			> Remove multiple mini refrigerators and buy a larger more efficient model	
	Are unnecessary refrigerators removed or switched off?			> Remove or unplug unused refrigerators	

Office equipment					
Check list		Y/N	Units (no., type)	Suggested follow-up action	Responsibility
Settings	Are computers, monitors, printers, copiers and other office equipment turned off when not in use?			> Place signage near exits reminding staff to switch off all equipment at the end of the day > Use reward programs to incentivise staff to switch off > Install timer plug ins on office equipment to switch off after hours > Ensure senior management leads by example and switch off each day	
	Are computers, monitors, printers, copiers and other office equipment set for "sleep" or energy saving mode?			> Program or set all equipment to energy saving or sleep mode	
Equipment	Is office equipment the most energy efficient models (generally Energy Star)?			> Consider upgrading older equipment to energy efficient Energy Star rated	
	Is Energy Star equipment specified when making purchasing decisions?			> Prioritise or require highest Energy Star rating for all new purchases in purchasing policy > Advise any staff making purchasing decisions to take advantage of energy efficiency opportunities	
	Are battery chargers (mobile phones, computers, etc) unplugged after use?			> Remind staff to unplug unused equipment	
Building					
Check list		Y/N	Units (no., type)	Suggested follow-up action	Responsibility
Maintenance	Are seals, weather stripping and caulking around openings in good condition?			> Replace seals that are cracked, dry or missing	
	Does building insulation need to be repaired or replaced?			> Replace insulation that is no long effective	
Settings	Are blinds and shades adjusted to take advantage of daylight and utilise or avoid the impact of solar heat?			> Adjust the blinds throughout the day to minimise heat loss or over heating	
	Are operable windows used for ventilation whenever possible?			> Open windows and take advantage of free fresh air whenever possible	
Facilities	Have thermal windows and glazing been installed to minimise heating and cooling loss?			> Consider replacing single paned windows the double or triple panes > Consider glazing/tinting to minimise solar heating	
	Are ceilings, roof and walls insulated?			> Consider insulating all possible walls, ceilings and roofing to maximise efficiency	
Vehicles and transportation					
Check list		Y/N	Units (no., type)	Suggested follow-up action	Responsibility
Maintenance	Do company vehicles receive regular maintenance?			> Schedule all vehicles for regular service inspections	
Equipment	Are company vehicles most fuel efficient models available for your business's requirements?			> Consider retiring older or inefficient vehicles and purchase more efficient and/or hybrid and diesel fleets	
	When purchasing a new vehicle is fuel efficiency prioritised?			> Prioritise fuel efficiency when purchasing new vehicles	
	Are vehicle GHG emissions offset?			> Consider purchasing carbon offsets for vehicle related GHG emissions	
Communication	Are employees encouraged or incentivised for taking public transport or carpooling?			> Promote public transport to staff > Organise carpooling schedules > Offer travel passes pre-tax	

Office: Water walk-through audit

Office size: _____ m^2

Operating hours: _____

Number of employees:_____

Baseline water use per annum: _____kL

Baseline water use KPI: _____ kL/m^2/year

Other instructions:

1. Identify water usage rates for all toilets, urinals, showers and taps. (Consult manufacturer's user guide for toilets and urinals and flow rate test instructions below for showers and taps)
2. Compare water flow rates to WELS ratings on Tables 11 and 12
3. If accessible, read water meters regularly and compare actual water use to the facility's water reduction goal. Large water users should continue to read meters daily. Commercial businesses using water for sanitary purposes only might read meters biweekly or monthly.

Simple toilet leak test

To detect silent leaks, remove the toilet cistern lid. Flush the toilet to empty the cistern and add a few drops of food colouring to the cistern as it refills. If the tank is leaking, colour will appear in the bowl within 15 to 30 minutes. If your toilets are not of the standard cistern and pan variety, (cavity mounted cisterns for example) then please do not attempt to investigate any leaks.

Note: Be sure to flush toilet after test is complete to ensure the food colouring does not stain toilet.

Shower and tap flow test

1. Fully turn on the cold-water tap of your shower or tap
2. Hold a bucket under the shower for 20 seconds
3. Remove the bucket and turn the water off
4. Measure the amount of water in the bucket by emptying a litre at a time into the measuring container
5. Calculate the flow rate (in litres per minute) by multiplying the number of litres by three. For example, if you collected 8 litres over the 20 seconds, the flow rate is 8 x 3 = 24 litres per minute

Administration and communication					
Check list		Y/N	Units (no., type)	Suggested follow-up action	Responsibility
Communication and policy initiatives	Has the critical need to conserve water been broadly communicated within your business?			> Develop and post commitment policy statement > Implement employee education and engagement programs	
	Has a management team been organised to provide strategy and leadership around water conservation?			> Create sustainability team involving senior management > Include sustainability measures in business strategy development	
	Has a water management plan or savings plan been developed?			> After audit, develop an immediate and long-term water savings plan	
	Have internal policies and procedures been developed around water conservation and management?			> Use the audit findings to develop policies and procedures addressing the most critical and immediate water savings measures	
Employee engagement	Are water conservation/efficiency posters displayed throughout the organisation?			> Display signage reminding staff to conserve water in relevant locations, i.e., kitchens, bathrooms > See Sydney Water's Every Drop Counts program	

	Do you provide rewards/ acknowledgement programs for employee who are conserve water?			> Develop engagement and rewards programs for staff	
	Are employees provided education around water conservation?			> Include water savings training at staff meetings and provide information in public areas such as bulletin boards and internal website	
	Are employees provided regular updates on water usage and progress towards water savings?			> Provide water savings progress reports to staff	
Water tracking	Is water usage regularly metered, monitored and recorded?			> Record the location of water meters on floor plan sheet > Record the meter number, reading, date and time	
	Is water use benchmarked against industry best practice?			> After baseline is determined, benchmark against industry standard > Alternatively, calculate water rating via NABERS website	
	Have water savings KPI and targets been set?			> After baseline and benchmarks are determined, set target savings	
	Are water costs and program performance included in financial and business reviews?			> Add water savings performance to financial reviews and updates	
Water billing	Do you know your water costs?			> Review and record water data for every bill received	
	Are monthly water bills reviewed for accuracy?			> Double check water usage vs cost for each bill > Review audit findings and bills for areas of high water use, investigate cause and check for leaks	
Metering					
Check list		Y/N	Units (no., type)	Suggested follow-up action	Responsibility
Meter reading	How often are meters read?			> Develop a metering schedule	
	Has leak detection been carried out by monitoring water meters during zero flow periods i.e. overnight?			> Record meter reading afterhours then again before opening. If there is a change in meter reading, there are leaks occurring	
Amenities					
Check list		Y/N	Units (no., type)	Suggested follow-up action	Responsibility
Toilets	Are toilets single flush?			> Replace with dual flush (6/3 litre or 4.5/3 litre models)	
	Are toilets dual flush?			> Check volume, replace 11/5.5 and 9/4.5 litre models with 6/3 or 4.5/3 litre models	
	Are the toilets leaking/running? (Test-see above)			> Fix leaks and running toilets	
	If you have single flush toilets, can you reduce the cistern flush volume?			> Consider reducing flush volume by adjusting cistern float arm or install a displacement device or weight. Caution- may not be appropriate for all models.	
	Are the cistern rubber seals on toilets replaced regularly?			> Replace every 2 years	
	Is the flow rate within the manufacturer's recommended range?			> If no, maintenance is required	
Urinals	Are urinals cyclical ('fill and dump') flushing?			> Replace with push button/pull chain or automatic sensor flushing units	

	Do urinals have automatic sensor flushing?			> Check sensors are working properly and not flushing more than once every 6 minutes regardless of number of users	
	Is the flow rate within the manufacturer's recommended range?			> If no, maintenance is required	
Sink taps (kitchen, bathrooms, etc)	Are sink taps leaking? Check tap and pipes below.			> Fix any leaks	
	Do sink taps have flow regulators or aerators? (To check tap flow, see above)			> Install flow regulators or aerators that reduce flow to at least 6 litres per min or install WELS rated showerhead	
	Are taps mixed (both hot and cold together) or separate?			> Convert to mixed tap to minimise wasting water-quicker achievement of optimum temperature	
	Is the flow rate within the manufacturer's recommended range?			> If no, maintenance is required	
Showers	Do showers have water saving showerheads? (To check tap flow, see above)			> Install flow regulator or aerator that reduces flow to at least 9 litres per min or install WELS rated showerhead	
	Are showerheads leaking?			> Fix leaks	
	Is the flow rate within the manufacturer's recommended range?			> If no, maintenance is required	
Dishwashers	Are dishwashers water efficient models?			> Consider upgrading to a more water and energy efficient model	
	Are dishwashers only run when full?			> Only run dishwashers when full	
	Are dishwashers only run on economy setting?			> Only run dishwashers on economy setting	
Large water boilers	Are water boilers switched off at night?			> Turn off at end of day > Install timer if needed	
	Is temperature set too high?			> Reduce to minimum needed	
	Are the boilers leaking?			> Check overflow valve, especially in older models	
	Is the boiler used frequently?			> If no, discontinue use and supply smaller more efficient kettle	
HVAC (no cooling tower)					
Check list		Y/N	Units (no., type)	Suggested follow-up action	Responsibility
Maintenance	Are HVAC systems scheduled for regular maintenance?			> Schedule regular maintenance	
Cleaning					
Check list		Y/N	Units (no., type)	Suggested follow-up action	Responsibility
Cleaning staff	Are water management and savings actions communicated to cleaning staff?			> If no, cleaning staff will need info about water saving cleaning tips. Educational signage and fact sheets are also helpful	
Outdoor space					
Check list		Y/N	Units (no., type)	Suggested follow-up action	Responsibility
Landscaping	Are there alternative water sources to irrigation?			> If no, consider rainwater or stormwater systems	
	Are native vegetation and/or low-water plants used for landscaping?			> When planting, utilise native and low-water plant species	
	Is compost used?			> Use of compost improves soil and will retain water	
	Are drip hoses used?			> Use drip hoses rather than sprinkler systems, minimises evaporation and water waste	

Offices: Visual waste audit and waste walk-through checklist

Office size: _____ m^2

Operating hours: _____

Number of employees:_____

Visual waste assessment:

This option for conducting a waste audit consists of visually sampling the waste stream and recording types and frequency of waste found in receptacles.

Main techniques:

> Visual inspection of the different waste types and systems within the building
> Estimate quantities of each waste type
> Conduct site analysis
> No physical sorting conducted

Before visual audit:

> Check with the maintenance/janitorial staff to schedule the audit at a time of day when building receptacles are all at their fullest
> Recruit two or three people to conduct the audit, depending on the size of the building and number of building waste receptacles
> Observe any OH&S requirements, i.e. plastic gloves, etc
> Ensure audit takes place on a 'typical' day, avoid times of unusually high or low waste activity such as holidays or end of financial year

Visual waste audit process:

1. Auditors should complete a walkthrough of the entire building, checking and recording the contents of 3-5 sample of waste bins on each floor or department. You should not typically have to handle garbage, a visual survey should be sufficient. Remember this is an estimate to gain a general idea of the types and amounts of waste being disposed of. Be sure to take notes.
2. Using the table below, estimate the percent bin is full, place a tick mark for each material observed in a receptacle and approximate the material volume by percentage
3. Repeat for each type of sample waste container in all locations (i.e. desk side containers, lunch/break room, kitchen, and supply rooms).
4. After completing the walk-through and recording your findings, tally the tick marks for each material. This will demonstrate which wastes were found most frequently throughout the building. For example, "copy paper was found in 5 out of 6 building waste receptacles." Also, be sure to account for percent bins are full as to not over estimate findings by assuming all bins are 100% full.
5. Repeat process for recycling bins, if applicable

Information found during a visual waste audit will help determine the types and amounts of wastes that could be recycled, reused, composted or avoided to begin with. If you already have a recycling program, this audit will let you know if additional communication and efforts are necessary to maximise recycling and reduce waste.

Terms used in audit:

Waste: garbage, trash

Materials: key supplies purchased, such as, stationary, paper, food, guest room items, cleaning supplies, etc

Recycling: recyclable materials such as paper, glass, metal, etc

Sample Visual Waste Assessment Worksheet							
Location: Repeat table for each area and recycling receptacles **Key Areas**: Kitchen, bars, guest rooms, break room, conference room, reception and central areas							
Material: Estimated visual (%)	Sample Waste receptacle 1	Sample Waste receptacle 2	Sample Waste receptacle 3	Sample Waste receptacle 4	Sample Waste receptacle 5	Sample Waste receptacle 6	Average findings
% of bin full	100%	50%	25%	10%	25%	0%	35%
Bin size	25 L	25L	25L	40L	25L	25L	27.5 L
Days since collection	1	1	1	1	1	1	1 day
Food and organics	× 50%	× 50%	× 10%	× 25%	× 0%	0%	22.5%
Cardboard	× 5%						
Copy paper	× 10%						
Newspaper	× 10%						
Aluminium cans	× 5%						
Glass							
Plastic	× 10%						
Mixed paper							
Magazines	× 10%						
Other							
Other							

Waste walk-through checklist					
Administration and communication					
Check list		Y/N	Units (no., type)	Suggested follow-up action	Responsibility
Communication and policy initiatives	Has the critical need to reduce waste and recycle been broadly communicated within your business?			> Develop and post commitment policy statement > Implement employee education and engagement programs	
	Has a management team been organised to provide strategy and leadership around waste reduction and recycling?			> Create sustainability team involving senior management > Include sustainability measures in business strategy development	
	Has a waste reduction and recycling plan been developed?			> After audit, develop an immediate and long-term recycling and waste minimisation plan	
	Have internal policies and procedures been developed around waste reduction and purchasing?			> Develop policies and procedures addressing the most critical and immediate waste reduction measures, i.e., recycling and purchasing policies	
Employee engagement	Are waste reduction/recycling posters displayed throughout the organisation?			> Display signage reminding staff to recycle and conserve resources	
	Are rewards/acknowledgement programs provided for employees who recycle and reduce waste?			> Implement engagement, education and rewards programs for staff	

	Are employees provided education around waste reduction and recycling?			> Include waste reduction and recycle training at staff meetings and provide information in public areas such as bulletin boards and internal website	
	Are employees provided regular updates on recycling and progress towards waste reduction?			> Provide waste reduction and recycling progress reports to staff	
Waste, material use and recycling tracking	Are waste production, material use (stationary, paper, supplies, etc) and recycling regularly monitored and recorded?			> Record material use, recycling and waste levels and spending when a bills are received > Determine waste, material use and recycling baselines	
	Are waste generation and recycling benchmarked against industry best practice?			> After baseline is determined, benchmark against industry standard > Alternatively, calculate waste rating via NABERS website	
	Have material use, recycling and waste reduction KPIs and targets been set?			> After baseline and benchmarks are determined, set target savings against industry standard (when available)	
	Are material use, waste and recycling program performance included in financial and business reviews?			> Add waste reduction, material use and recycling performance to financial reviews and updates	
Waste, material use and recycling billing	Are monthly waste, material use and recycling bills reviewed for accuracy?			> Double check waste, material use and recycling generation vs cost for each bill > Determine your waste generation, recycling and disposal costs, see Table 7 > Calculate and review your material use by recording and monitoring invoices for consumables such as paper, stationary and other common supplies	
Recycling					
Check list		Y/N	Units (no., type)	Suggested follow-up action	Responsibility
General waste	Are there recyclable materials in the general waste, i.e. cans/bottles?			> Communicate recyclable materials and goals to staff regularly > Post signage reminding staff to recycle and what materials can be recycled	
	Is there high contamination in recycling bins, i.e. garbage in paper recycling bins?			> Communicate recyclable materials and goals to staff regularly > Post signage reminding staff to recycle and what materials can be recycled	
Comingled	Is comingled recycling provided?			> Consider providing comingled recycling bins at each desk	
Paper	Is paper recycled?			> Provide comingled or paper recycling at each desk and near printers/copiers/faxes	
	Are secure documents recycled?			> Contact your recycling provider and discuss options for secure document recycling	
	Is there paper/cardboard in garbage bins?			> Communicate paper recycling goals to staff regularly > Post signage reminding staff to recycle and what materials can be recycled	
Plastic	Is plastic recycling available?			> Contact recycling provider > Consider comingled recycling options > Provide receptacles in vital areas, i.e. kitchens	
Aluminium/metal	Is aluminium/metal recycling available?			> Contact recycling provider > Consider comingled recycling options > Provide receptacles in vital areas, i.e. kitchens	

Glass	Is glass recycling available?			> Contact recycling provider > Consider comingled recycling options > Provide receptacles in vital areas, i.e. kitchens	
Location	Are waste bins provided at each desk?			> Remove waste bins from each desk and replace with co-mingled or paper recycling bin > Provide centrally located waste bins rather and individual bins	
	Are general waste and recycling bins located in convenient locations?			> Place recycling bins near printers/copiers > Only provide the minimum number of waste bins necessary and have recycling bins next to general waste bins	
Awareness	Are employees informed and provided information on recyclable materials and goals?			> Give regular waste reduction updates at staff meetings > Provide signage about waste reduction > Remind staff on a regular basis on what can be recycled	
	Are recycling bins clearly labelled with accepted recyclables?			> Label bins and post signs near waste and recycling bins noting accepted materials	
	Are waste and recycling bins consistent in colour and design making them the clearly distinguishable?			> Try to ensure waste and recycling bins are different from each other and consistent in colour and size to avoid confusion or accidental waste disposal rather than recycling	
	Are there examples of good practice, i.e. reuse paper trays near printers, double sided printing signs near printers?			> Place reuse trays and recycle bins near printers/copies > Post reminder signage	
	Are cleaning/janitorial staff informed on waste reduction and recycling initiatives?			> Review recycling procedures and accepted materials with cleaning staff > Include cleaning staff in waste and recycling education initiatives	
Supplies and purchasing					
Check list		Y/N	Units (no., type)	Suggested follow-up action	Responsibility
Paper	Are paper and stationary products made from recycled content? If yes, what percent is recycled (5,30,100%)?			> If yes, consider sourcing options with higher recycled content when possible > If no, source options with recycled content	
	Are there paper or stationary products that are rarely used?			> Review paper and stationary needs and discontinue unnecessary or duplicate products	
	Are bathroom tissue and paper towels made from recycled content?			> Source options with recycled content	
Toners	Are toner and printer cartridges remanufactured?			> Rather than buying new cartridges, source remanufactured options	
	Are toner and printer cartridges recycled?			> Recycle cartridges to manufacturer or designated recycling facility	
Cleaning products	Do cleaners use environmentally friendly cleaning products			> Discuss changing to green products with cleaning service provider > Supply green cleaning products to cleaners	
	Do maintenance and grounds keeping staff use green chemicals or less toxic alternatives to such chemicals as paints, fertilisers and pesticides?			> Discuss changing to green products with grounds and maintenance staff > Supply and source green product alternatives	

Kitchen supplies	Does your office use disposable dishes, cups and utensils? If yes, what kind (polystyrene, plastic, paper, bio-degradable, etc)?			> If yes, supply reusable mugs and utensils for all staff use > If disposables are necessary, source those that can be recycled, reused more than once and/or made from recycled/biodegradable content	
Misc supplies	Are duplicate supplies purchased for all employees?			> Review supplies and determine which can be shared > Provide communal area for infrequently used supplies	
	Is there obvious waste of unused items i.e. office stationary?			> Avoid reordering	
	Have staff who purchase supplies been informed of waste reduction policies and initiatives?			> All staff who are involved in purchasing should be briefed on waste reduction measures and sustainability purchasing policies	
	Are 'green' supplies purchased?			> When purchasing new office supplies, look for green options such as 'stapleless' staplers, reusable clips and refills > Prioritise supplies that minimise packaging or packaging can be recycled or returned for reuse	
Office equipment					
Check list		Y/N	Units (no., type)	Suggested follow-up action	Responsibility
Efficiency rating	Are all pieces of office equipment Energy Star rated?			> Purchase energy efficient models when replacing or upgrading equipment	
Copiers, printers and faxes	Do all copiers have duplex capacity? Number yes: Number no:			> Purchase multipurpose printers/copiers with duplexing capacity > Consider rationalising copiers to a fewer number of multipurpose printers/copiers	
	Are all computers and printers default settings set to print double sided?			> Set defaults to print double sided	
	Do all printers have duplex capacity? Number yes: Number no:			> Purchase multipurpose printers with duplexing capacity > Consider rationalising printers to a fewer number of multipurpose printers/copiers	
	Do all faxes have duplex capacity? Number yes: Number no:			> Purchase fax machines with duplexing capacity > Utilise emails rather than faxing	
	Is office equipment recycled or properly disposed at end of use?			> Avoid sending outdated equipment to the landfill, find a recycling centre or donate	
	Are mobile phones recycled?			> Collect mobile phones and chargers and recycle > Set up a mobile phone recycling bin at work. Visit www.mobilemuster.com.au	
Miscellaneous					
Check list		Y/N	Units (no., type)	Suggested follow-up action	Responsibility
Electronic communication	Do you send paper invoices?			> Switch to paperless (electronic) billing	
	Do you send out paper advertisements or promotions?			> Send advertisements via email	
	Is your mailing list regularly updated?			> Remove duplicate and out of date addresses from mailing lists	

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