



ECO ACHIEVER IN THE BLUE MOUNTAINS

BLUE MOUNTAIN WORLD HERITAGE INSTITUTE

27th April 2007

Ref: J/N 106739



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energy
greenhouse
solutions



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Final	BDW	RT	BDW	27 April 07

Confidentiality Disclaimer

CONFIDENTIALITY AND DISCLAIMER STATEMENT

Confidentiality

The information in this report is confidential and may be legally privileged. It is intended solely for the company addressee(s).

Disclaimer

The report draws on information provided by the client and other sources. Energetics has relied on this information in making its assessment.



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Executive Summary

Energetics was commissioned by the Blue Mountains World Heritage Institute to conduct a series of “eco-efficiency” audits on micro businesses¹ in the Lawson area of the Blue Mountains in October and December 2006. These audits consisted of:

- An assessment of management practices with respect to energy, water and waste using Energetics’ Eco-AchieverTM diagnostic tool.
- Creation of a Management Action Plan to address current shortcomings in management practices relating to energy water and waste.
- Provision of a “trending tool” to allow for the graphical representation of volumes, costs and activity indicators for energy, water and waste.
- A walk through audit of the participating business in order to identify potential technical actions in relation to the efficient use of energy and water and improved waste minimisation, management and disposal.

11 businesses participated with a combined energy, water and waste bill of \$87,820. These businesses included the primary school and the local community centre.

Knowledge and understanding of waste management issues is very high and there is an increasing awareness about water and energy. However in the businesses reviewed, waste, water and energy initiatives are generally implemented as a result of the enthusiasm of individuals rather than by structured systems.

While only one business achieved the highest possible Eco-AchieverTM score, best practice was achieved in all elements of the diagnostic by different businesses. This demonstrates that small business has the interest and capability of achieving best practice in relation to eco-efficiency.

Some of the specific observations from this exercise were:

- Awareness of energy issues was relatively low, despite energy accounting for 73% of costs.
- Feedback forms were completed and returned by seven of the participating businesses
- The audits were generally well received with 100% indicating they would recommend the process to other businesses.
- 86% indicated that they would implement some of the recommendations identified.
- The principle barriers to improving eco-efficiency were identified as the cost of implementing projects and the availability of reputable suppliers.

Opportunities identified for the Blue Mountains World Heritage Institute were as follows:

1. Some businesses had specialist waste management systems in place for regulatory reasons. They were willing to consider others using these systems,

¹ Micro businesses are defined by the Australian Bureau of Statistics as sole traders or businesses employing less than 5 people

e.g. specialist bins for waste metal collection. Some already did as they were paid by bin content. Others weren't and while willing to allow others to use the system, were not prepared to handle administration. A solution would need to be coordinated by either the council, business, waste contractor or a new third party.

2. The relationship between the council and the Community centre had a discontinuity between building owners and maintainers and the building operators, who paid for energy water and waste costs. Measures to improve energy efficiency via timers will be a cost to the council, while the benefits will be received by operators, voluntary groups etc. This disparity leads to inefficient operation. While the centre's energy water and waste budgets are small in absolute terms, the mirroring of this scenario in community buildings throughout the Blue Mountains Council area represents a significant amount of consumption and addressing this discontinuity would represent a significant opportunity.
3. Waste generated by some business could provide raw materials or even fuel sources for others. Individuals had made efforts to advertise the availability of such resources, but had failed to identify takers. Opportunity for BMCC or a third party maybe to create a website to inform businesses to aid in closing the loop
4. Improved insulation and lighting were identified as the most significant technical opportunities with respect to energy. There is an opportunity for BMCC to encourage a supplier to provide assessments and quotations to a number of potential customers. Grants or rebates for increased insulation would represent the most cost effective energy efficiency measure for the Lawson area.
5. Solar hot water heating that was identified as a significant opportunity for a number of sites, need grants or rebates. Individuals are willing to spend their own money, but there is insufficient information regarding cost of installation, service availability or expected performance. The BMCC could act as a central clearinghouse for requests regarding solar energy in Lawson and approach a contractor with a bulk buy. This would encourage service providers who may not service the area on a job-by-job basis.
6. The participants liked the idea of a scheme to identify ecologically responsible businesses within the area. Participants could be identified by the grant permission to use a logo or similar Public Relations based initiative. Concerns were expressed about how enforceable and regularly audited it should be to maintain credibility.
7. The influence of fixed sewage service charges represents a limiting factor in implementing water conservation measures. A review of policy with respect to the role of fixed charges limiting consumption savings could be undertaken by the BMWHI.

This project was financially supported by Integral Energy and supported in principle by the Blue Mountains City Council.

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Project Brief

Energetics was commissioned by the Blue Mountains World Heritage Institute (Institute) to conduct a series of “eco-efficiency” audits on micro businesses² in the Lawson area of the Blue Mountains in October and December 2006. These audits consisted of:

- An assessment of management practices with respect to energy, water and waste using Energetics’ Eco-Achiever™ diagnostic tool.
- Creation of a Management Action Plan to address current shortcomings in management practices relating to energy water and waste.
- Provision of a “trending tool” to allow for the graphical representation of volumes, costs and activity indicators for energy, water and waste.
- A walk through audit of the participating business in order to identify potential technical actions in relation to the efficient use of energy and water and improved waste minimisation, management and disposal.

This report summaries the finding of those audits in terms of:

- Existing practices
- Recommended management actions
- Identified opportunities
- Reactions of the participants to the auditing process

This project was financially supported by Integral Energy and supported in principle by the Blue Mountains City Council.

ACKNOWLEDGEMENTS

Energetics thanks management and staff members at the sites that participated in the Eco Achiever Audits for their assistance and time. Thanks go to Mr. Michael Kachka and Mr. John Merson who commissioned the review and to Ms. Cheryle Yin-Lo and the members of the Blue Mountains World Heritage Institute.

If you would like to discuss any of the topics or have any questions please feel free to contact Energetics on +61 2 9929 3911

² Micro businesses are defined by the Australian Bureau of Statistics as sole traders or businesses employing less than 5 people

1. Introduction

PURPOSE

Energetics was commissioned to undertake a series of eco-efficiency audits in the Lawson region by the Blue Mountains World Heritage Institute. Given Lawson's proximity to Sydney, and improved communication links, Lawson is expected to experience an increase in commercial and light industrial activity. The Institute and local residents are anxious to ensure that the benefits of increased activity do not adversely impact on the unique natural heritage in the Blue Mountains. These audits were designed to assess the current practices and assist in the identification of possible future actions to ensure the sustainable development of the Lawson Industrial Estate.

AUDIT STRUCTURE

These audits consisted of the following;

- An assessment of management practices with respect to energy, water and waste using Energetics' Eco-Achiever™ diagnostic tool.
- Creation of a Management Action Plan to address current shortcomings in management practices relating to energy, water and waste.
- Provision of a "trending tool" to allow for the graphical representation of volumes, costs and activity indicators for energy, water and waste.
- A walk through audit of the participating business in order to identify potential technical actions in relation to the efficient use of energy and water and improved waste minimisation, management and disposal
- The provision of a report containing the results of the diagnostic and the audit, along with recommended courses of action in each area
- A feedback form to ascertain reaction to the program and areas for improvement

AUDIT TOOLS

Eco-Achiever™

Eco-Achiever™ helps small-medium enterprises assess their current energy, water and waste (eco-efficiency) management practices, identify critical actions and provides a structured framework to achieve continuous improvement in eco-efficiency management. The diagnostic takes about 60 minutes, and output includes:

- Assessment of the current status of eco-efficiency management
- Identification of strengths and weaknesses in management of eco-efficiency
- Recommended actions for improving management of eco-efficiency

The **Eco-Achiever™** diagnostic tool assesses management practices across 15 elements via a series of structured Yes/No questions. These elements are indicated in Figure 1. This allows for the business' practices to be rated and critical actions identified. An action plan is derived from the elements highlighted as critical by the diagnostic. This ensures that the most appropriate actions are identified and

implemented first. This allows for the logical improvement of practices and that businesses are not asked to run before they can walk.

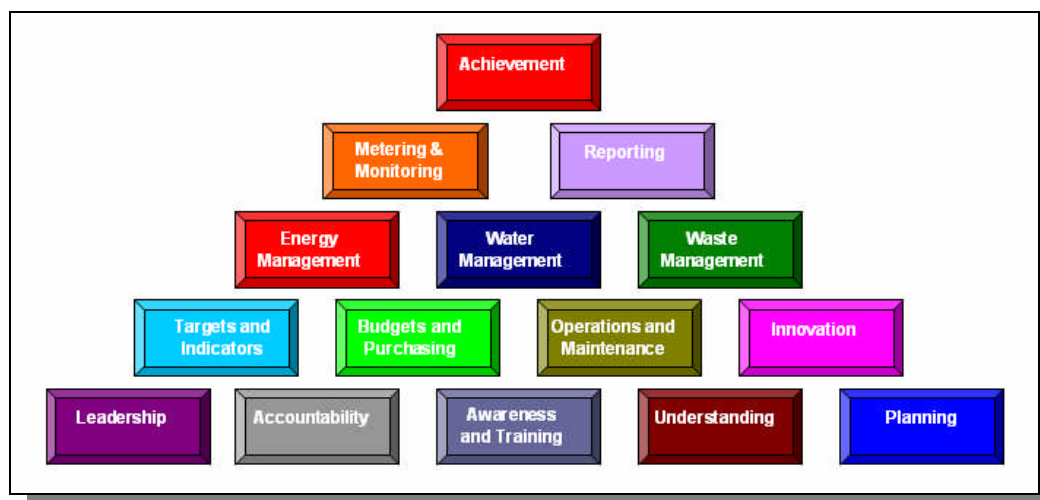


Figure 1. Eco Achiever™ Elements

Element Description

Leadership, the extent to which the owners and managers have made written commitments to eco-efficiency

Accountabilities, the extent to which managers and other staff are accountable for energy and water consumption and waste minimisation

Awareness, the measures take to make staff and customers awareness of eco-efficiency matters

Understanding, the level of understanding about eco-efficient projects and their potential benefits

Energy Management, specific questions relating to electricity management

Water Management, queries water specific projects specifically water efficiency, rain water harvesting and grey water harvesting in that order

Waste Management, queries waste management specific projects, specifically on site recycling, packaging and recycled raw materials in that order

Planning, queries how potential projects are identified, implemented and budgeted

Targets and Indicators, queries the level of tracking of energy water and waste consumption and any efforts made to relate them to business activity

Budgets and Purchasing queries how energy water and waste are financially accounted for and their influence on equipment purchasing

Operations and Maintenance queries energy water and waste influence on operations and maintenance decisions

Innovation, queries how active the business is in identifying opportunities and new developments

Metering and Monitoring, queries the level and use made of existing metering

Reporting queries how existing information is used and disseminated

Achievement assess the performance of the organisation in relation to energy water and waste in the previous year

Actions are identified as critical based on an internal ranking of the importance of each element and the level achieved.

Ideally, Eco Achiever™ should be used as part of a continuous improvement model illustrated in Figure 2.

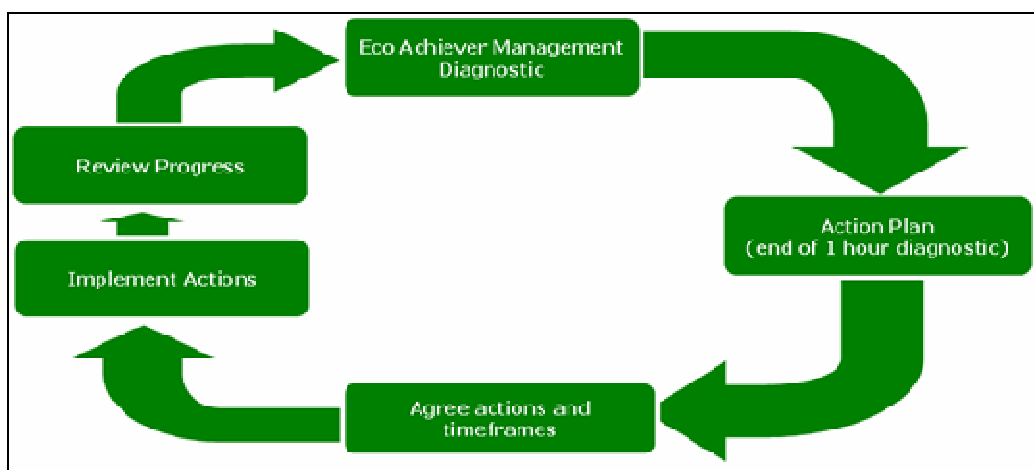


Figure 2. Continuous Improvement Model

Opportunity Identification

Energy

The energy element of the audit focused on identifying opportunities surrounding the use of electrical and thermal energy. Areas that would be examined would include:

- Lighting
- Air conditioning and space heating
- Compressed air usage
- Office equipment
- Specialist equipment

Water

The water element of the audit focused on opportunities surrounding water consumption and discharge to sewers including:

- Staff and customer awareness
- Water efficient equipment such as taps, showerheads and dual flush toilets
- Rain water and grey water harvesting, in particular for landscaped areas where appropriate

Waste

The waste element of the audit focused on opportunities surrounding waste minimisation, and increased recycling particularly:

- Appropriate disposal of potentially toxic waste streams
- Identification of waste streams which could potentially act as raw materials for other businesses
- Identification of existing waste disposal systems that could be used by other businesses

Trending Tool

A spreadsheet was developed to allow the tracking and visual representation of consumption and cost of energy, water and waste. The tool allowed for the inputting of historical as well as future consumption and cost data surrounding energy, water and waste.

Eco-Efficiency Trending Tool							
	Enter Data on Main Business Variable			Electricity			
	Total Cost	Eco Cost KPI \$ per pupil		Consumption (kWh)	Cost (\$)	Consumption KPI	Cost KPI
	pupil		pupil				
Oct-04	120	\$ 250.00	2.083333	2,500	\$ 250.00	20.83333333	2.08333333
Nov-04	115	\$ 220.00	1.913043	2200	\$ 220.00	19.13043478	1.9130435
Dec-04	75	\$ 110.00	1.466667	1100	\$ 110.00	14.66666667	1.4666667
Jan-05	10	\$ 50.00	5	500	\$ 50.00	50	5
Feb-05	115	\$ 110.00	0.956522	1100	\$ 110.00	9.565217391	0.9565217
Mar-05	120	\$ 250.00	2.083333	2500	\$ 250.00	20.83333333	2.08333333
Apr-05	120	\$ 250.00	2.083333	2500	\$ 250.00	20.83333333	2.08333333
May-05	120	\$ 300.00	2.5	3000	\$ 300.00	25	2.5
Jun-05	120	\$ 350.00	2.916667	3500	\$ 350.00	29.16666667	2.9166667
Jul-05		\$ -	NA			NA	NA
Aug-05		\$ -	NA			NA	NA
Sep-05		\$ -	NA			NA	NA
Oct-05		\$ -	NA			NA	NA

Figure 3. Trending Tool Screenshot

This information can then be graphed to provide a visual representation of cost and consumption as well as identify possible trends. The inclusion of a business activity indicator would allow for the development of “Key Performance Indicators” with respect to energy water and waste e.g. kWh per customer.

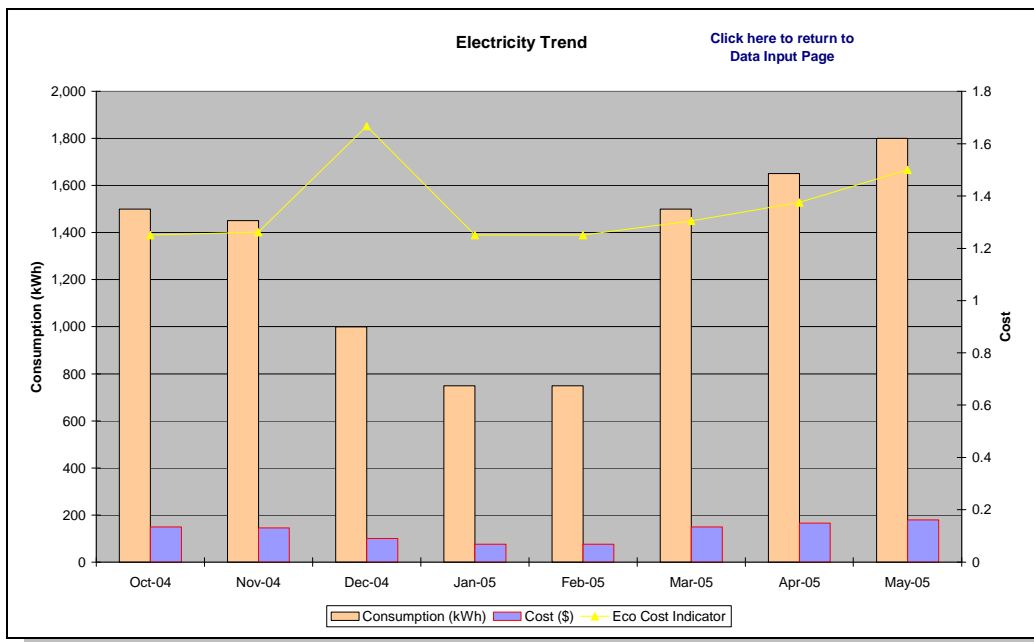


Figure 4. Key Performance Indicator Trending Graph

Site Report Structure

The site reports contained the following elements

- Site description and current or “baseline” Energy, Water and Waste costs
- “Traffic Light” performance indicator for each element
- Management Action Plan with responsible individual and due completion date
- List of identified opportunities including recommendations for each sector
- List of useful contact and websites to assist with opportunity implementation

A sample report is given in Appendix A.

2. Findings

LOCATION

The audits were concentrated around the Lawson Industrial Area. Lawson is located approximately 10km East of Katoomba on the Great Western Highway. The industrial area is located to the East of the train station as indicated in figure 5 below. Seven of the participating sites were located on the estate while the remainder were well scattered throughout the township.

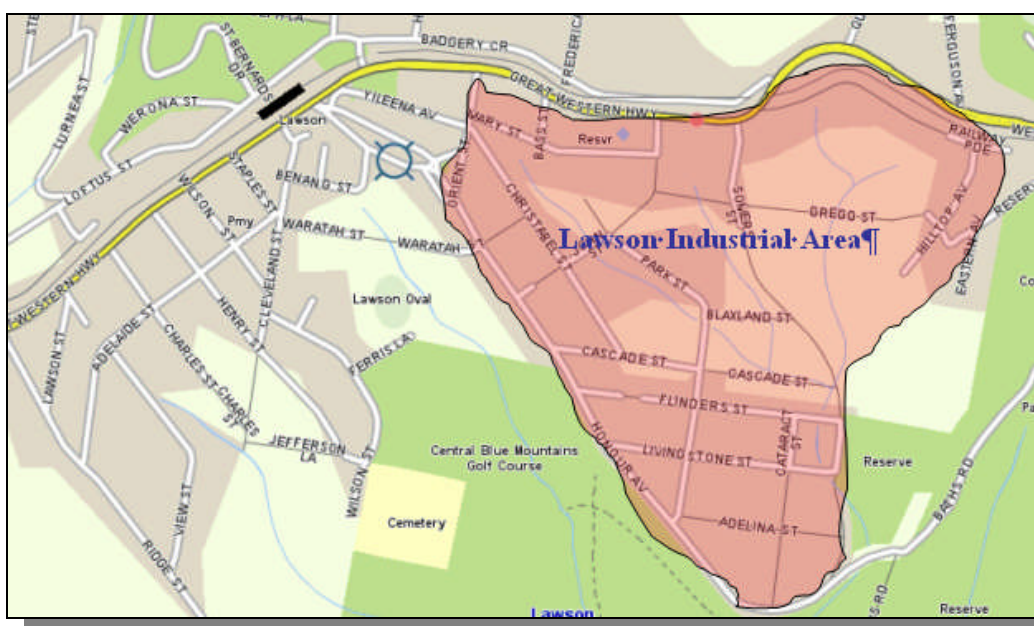


Figure 5 Lawson Township and Industrial Area³

PARTICIPANTS

Table 1. Participating Sites

Business	Address	Description
Mount Hay Technology	25 Livingstone Street Lawson	Mount Hay Technology is a software development company located in a converted domestic house. Two other businesses utilise the environmental services associated with it, an electronics repair workshop and a voluntary nursery.
Mid Mountains Animal Health Centre	8 New Street Lawson	The health centre is a veterinary practice located in a converted domestic hose, including reception, operating and kennels areas.
Araluen Bed and Breakfast	59 Wilson Street Lawson	Araluen Bed and Breakfast is a four bedroom house in extensive grounds

³ Map from www.whereis.com

Business	Address	Description
Skinner's Hardware	9 Honour Avenue Lawson	Skinner's Hardware operates from a converted domestic house, which was formerly used as a shop. They sell various hardware materials, including lighting, plants and paints
Bower Contracting and Consulting	Unit 2/19 Flinders Street, Lawson	Bower Contracting are engaged in the design and installation of metal fabrications on behalf of a wide range of customers including the Blue Mountains City Council and the RTA
Blue Mountains Automotive	18 Cascade Street, Lawson	Blue Mountain Automotive specialises in automotive electrical work, general automotive repairs and the servicing of air conditioning systems.
Lawson Public School	Adelaide St, Lawson	Lawson Public school has approximately 180 pupils. It comprises an administration area, classrooms and a special education unit.
Mid Mountains Community Centre	9 New Street, Lawson	The community centre consists of an assembly hall, primarily used by Lawson Public School, a kitchen utilised primarily by Food Services, a children's centre and the centre's administrative offices
Olori Furniture	19 John St, Lawson	Olori furniture is a warehousing sales and distribution business of imported furniture.
GWH Kitchens	45 Livingstone St, Lawson	GWH Kitchens renovates and installs new kitchens for the domestic sector. The office area also hosts the administration of two charitable organisations
Branches Timbercraft	41 Flinders St, Lawson	Branches Timbercraft manufactures and installs wooden windows

ENERGY WATER AND WASTE CHARGES

The combined energy water and waste charges for all sites is shown in Table 2 and are illustrated in Figure 6 below. An attempt was made to gather data surrounding consumption of electricity and water and the volumes of waste generated, but insufficient data was available to be comprehensive.

Table 2. Environmental Charges All Sites

Sector	Charge
Energy	\$ 63,459
Water	\$ 10,579
Waste	\$ 13,242
Total	\$ 87,280

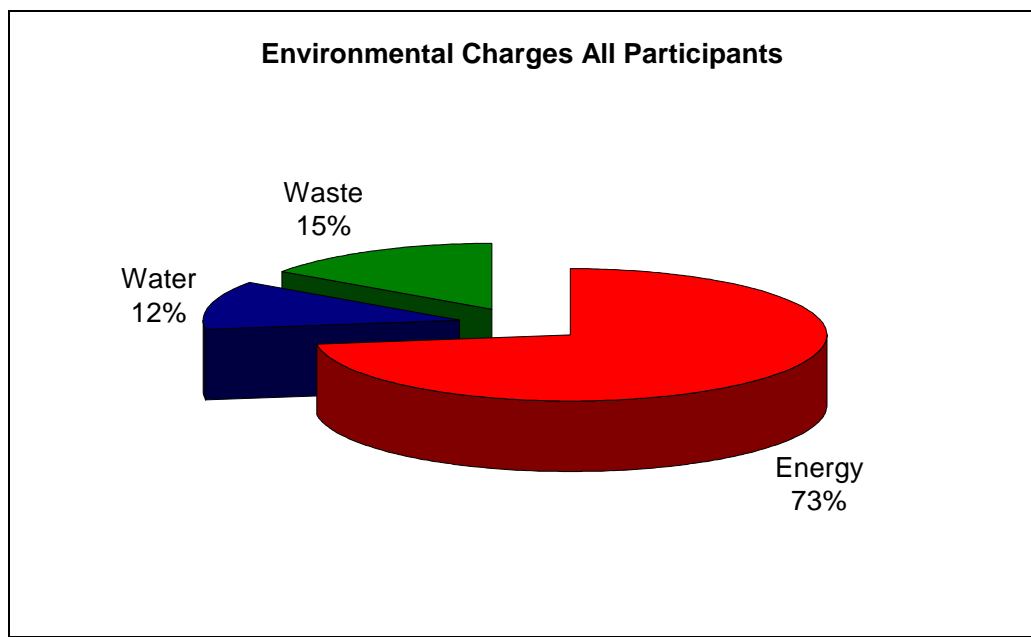


Figure 6. Combined Environmental Charges

Energy consumption was dominated by the large public buildings, with the school and Community centre accounting for 61% of the total energy consumption. Energy consumption was predominantly associated with heating and cooling and lighting.

Almost 33% of water charges are associated with fixed sewage charges set by the utility, and as such the businesses cannot influence this element.

Five businesses were in leased premises. Of these, three did not pay any water charges, while two had the full cost of water and sewage passed onto them by their landlord.

Waste charges varied significantly from business to business, with a single business accounting for over 33% of all waste charges. Sites that had legal disposal requirements for toxic substances generally showed better awareness and performance with respect to waste minimisation and disposal than businesses which did not deal with toxic waste streams.

The level of disposal of Waste Electrical and Electronic Equipment was significant, despite the lack of a local collection service. Awareness of the potentially hazardous nature of this type of waste had led individuals to go out of their way to ensure safe disposal.

CURRENT PRACTICES

Implemented measures observed during the audits provide detail of the current level of awareness and where individuals feel empowered to act.

Waste Management

Current waste management practices are illustrated in Figure 7 below.

A high level of awareness and activity was shown surrounding waste minimisation and disposal. Major efforts have been made to identify other businesses that may consider waste generated by another as a resource, and individuals who had to implement specific waste management measures as part of regulation had managed to make these arrangements self financing or even profitable by providing a safe outlet for other businesses waste. A good example of this practice is the battery disposal service offered by Blue Mountain Automotive.

Awareness surrounding hazardous waste was high, and every effort was made by participating business to dispose of such waste in a sustainable fashion. Participants felt that this has not necessarily been recognised and there is no mechanism to penalise businesses who do not take such care

A high degree of recycling is taking place, despite the limited availability of recycling services for commercial businesses. Individuals have taken it upon themselves to bring ordinary recyclables home so that they might be disposed of appropriately in the domestic system. This demonstrates the high level of commitment to correct practice in the community.

Efforts have been made by some businesses to identify other businesses that might be able to use their waste. A good example of this was sawdust from Branches Timbercraft being used as bedding for horses. However, when this outlet became unavailable, finding another outlet proved difficult. Limited knowledge of surrounding businesses' needs and the fact that this activity is outside the businesses' core tasks are the principle barriers to expanding this activity.

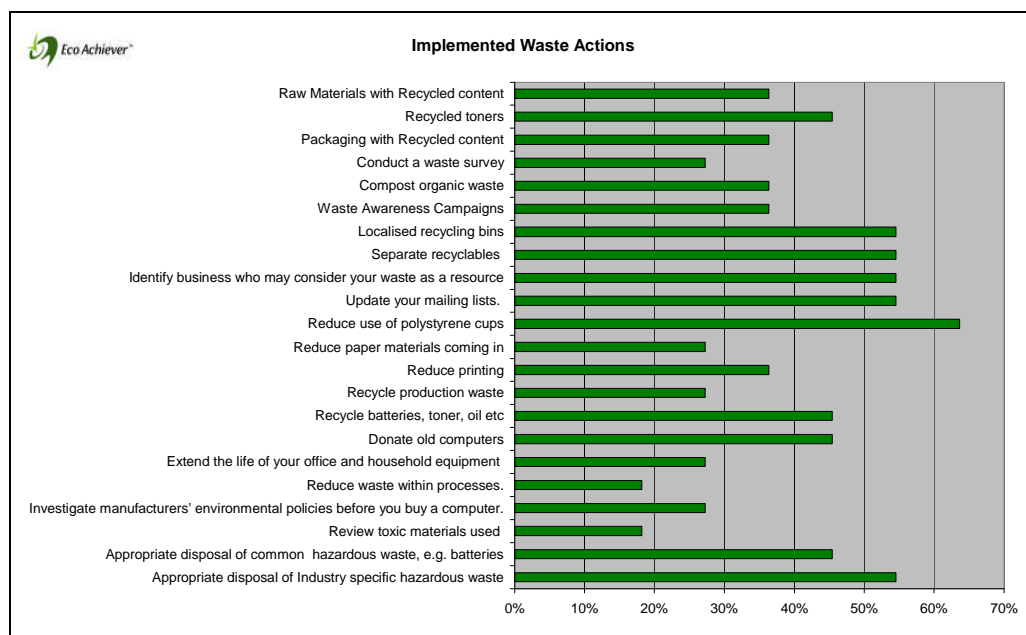


Figure 7. Currently Implemented Waste Management Actions

Water

Current water management practices are illustrated in Figure 8 below. Rain water harvesting had a relatively high level of awareness and implementation. Participants expressed a significant amount of interest in possible rebates or other forms of financial support for this measure. Dual flush toilets have been installed as part of any renovations, and leaks are monitored and repairs made. For the majority of the participants, the significant element of their water bill was associated with the sewer

connection. This is set by the utility and is independent of the levels of use. Given the size of most of the participants they would have little ability to individually influence this charge.

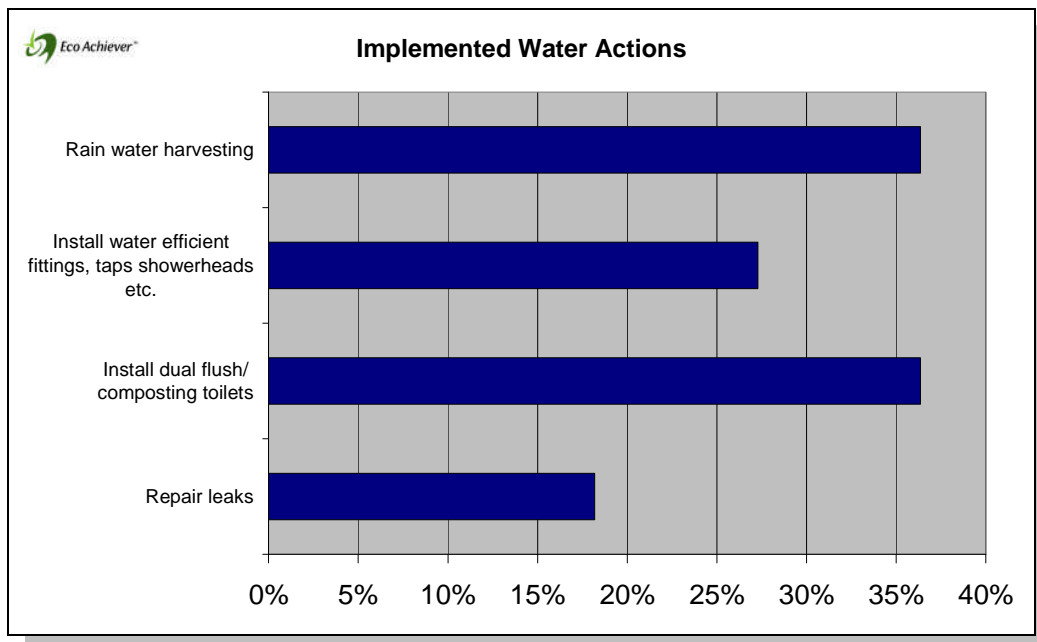


Figure 8. Currently Implemented Water Measures

Energy

Energy savings measures, as illustrated in Figure 9, have been implemented in an ad-hoc manner, with all business having implemented at least one energy efficient action. Understanding of issues surrounding energy is less developed compared to waste and water. This is not surprising given the level of publicity surrounding water and waste, but energy does account for 75% of considered costs and offers the best financial rewards.

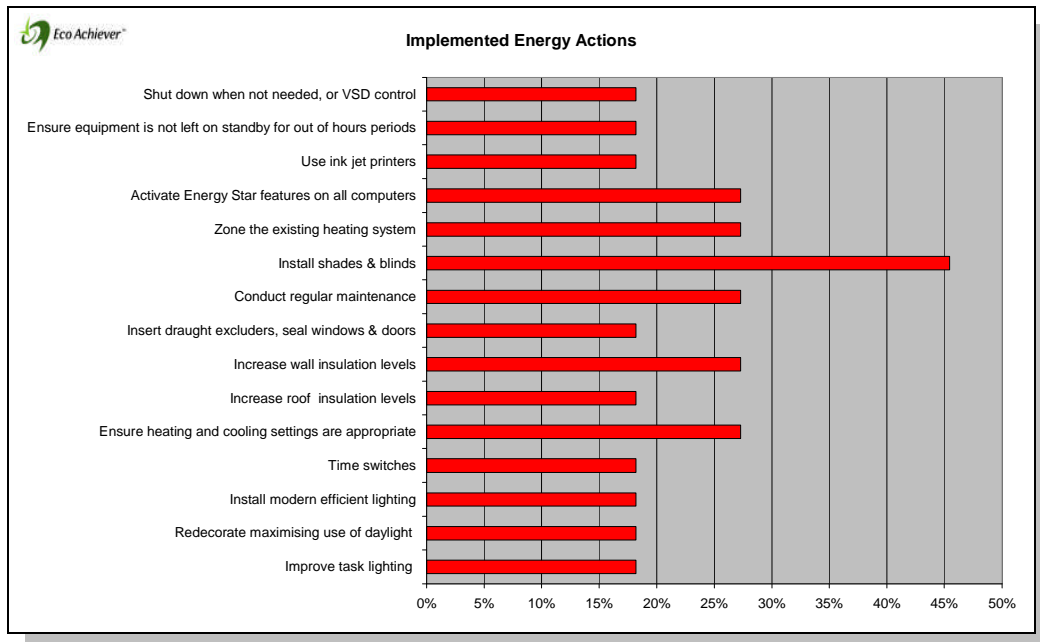


Figure 9. Implemented Energy Actions

DIAGNOSTIC ANALYSIS

Critical Action Analysis

The following areas were identified as being in most need of attention based on the number of times they were nominated as a critical action by the **Eco-Achiever™** diagnostic tool. These results are illustrated in Figure 10 below.

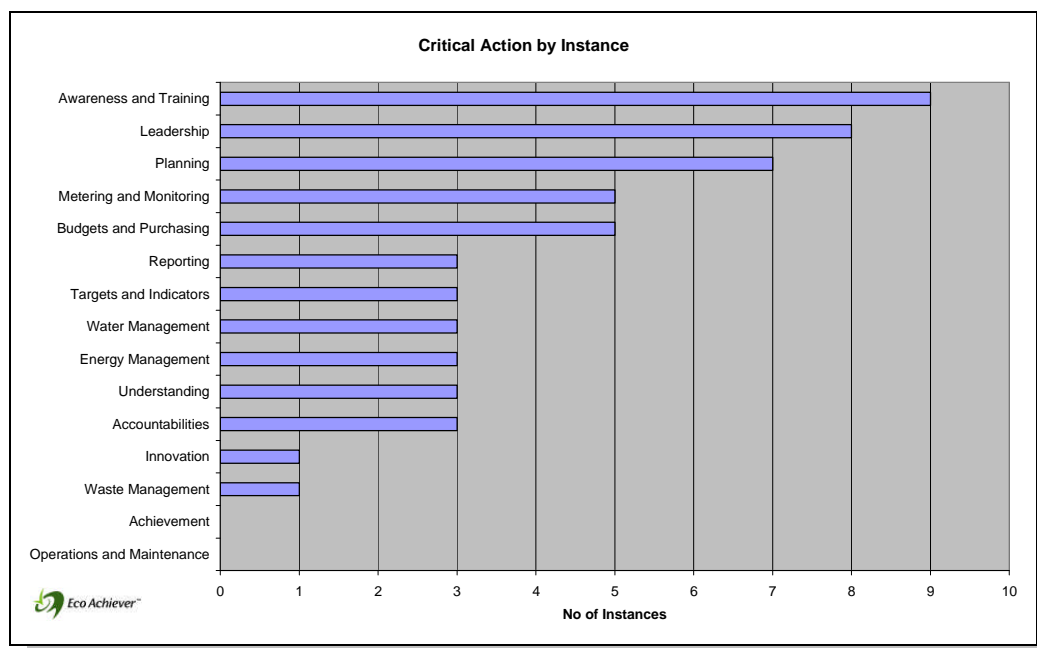


Figure 10. Eco-Achiever™ Diagnostic Identified Critical Actions

Awareness and training, particularly staff and customer awareness utilising signage and information leaflets. These are frequently available from utilities and suppliers and can significantly influence behaviour of both staff and customers.

Leadership, particularly focusing on businesses having a written commitment to review and improve energy, water and waste practices.

Interest was expressed by all participants in participating in an audited and accredited scheme of continuous improvement. It was felt that businesses that are ecologically responsible should be rewarded by being able to publicly demonstrate this and differentiate themselves from businesses that are not making similar efforts. Use of a logo in marketing materials for participating businesses would be valued, if the scheme was audited and integrity of the process ensured.

Planning. While individual measures improving eco-efficiency are implemented as businesses become aware of them, creating a list of potential opportunities and assessing their suitability is not generally practiced. This means potentially good opportunities can be overlooked due to pressures of the day-to-day running of the business.

Budgets and Purchasing. There was a low level of awareness surrounding potential financial support available from utilities and government to assist micro businesses in implementing eco-efficiency projects. Research conducted in preparation of these audits revealed limited support for such businesses.

Metering and Monitoring. While good information is available on utility bills, this information is rarely harnessed by businesses to track performance or allow for focus on areas of potential savings. The tracking tool provided will assist businesses in making use of this information.

An analysis of the results reveals that best practice in relation to energy, water and waste is being achieved by small business, albeit in a fragmented manner. Only a single business received the highest possible rating, however, as Figure 11 below reveals, best practice was achieved in all elements of the diagnostic.

This demonstrates that small business has the interest and capability of achieving best practice in relation to eco-efficiency.

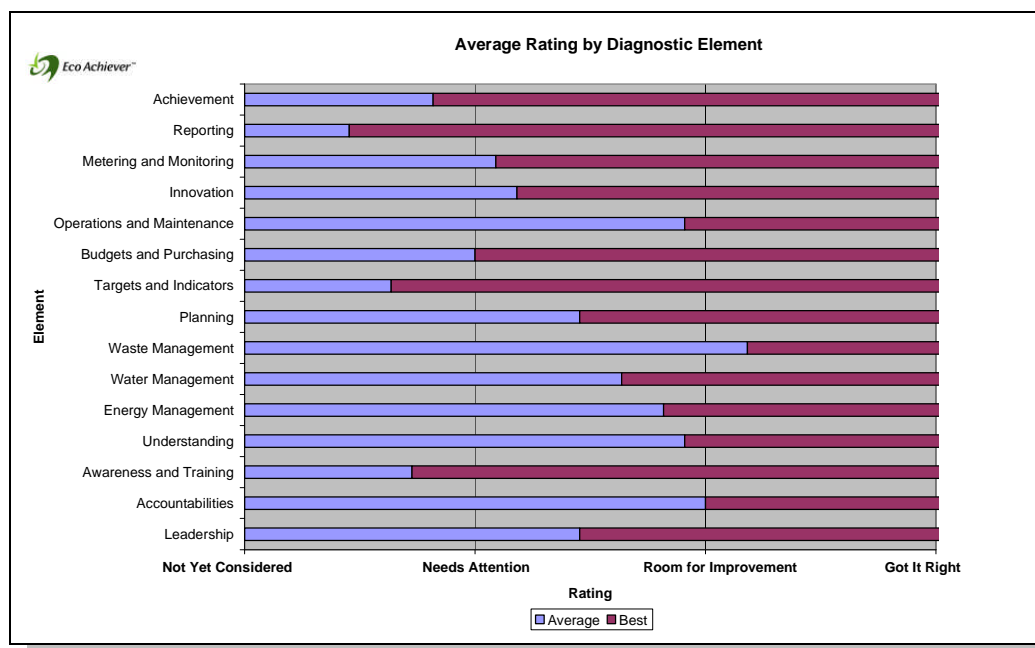


Figure 11. Aggregated Eco-Achiever™ Diagnostic Results

Knowledge and understanding is very high surrounding waste management issues and increasingly around water and energy. However these are generally implemented via the enthusiasm of individuals within the businesses rather than by structured systems.

Trending of volumes and costs surrounding energy water and waste was not common, and this made it difficult for participants to quantify achievements that may have occurred in the previous years. As a result, reporting was the lowest scoring element in terms of best practice.

IDENTIFIED ACTIONS

Energy

The greatest opportunities were identified in the following broad categories:

- Out of hours usage
- Lighting
- Insulation and draught exclusion

These areas provide potentially large savings with respect to their capital cost.

Solar hot water heating was also identified as a widely applicable technology that would have a significant impact on electricity and gas consumption. However, given the size of energy bills at the various businesses, this technology would require some kind of financial assistance to make it viable.

The trending of consumption and associated cost was highlighted in this area as it was in water and waste

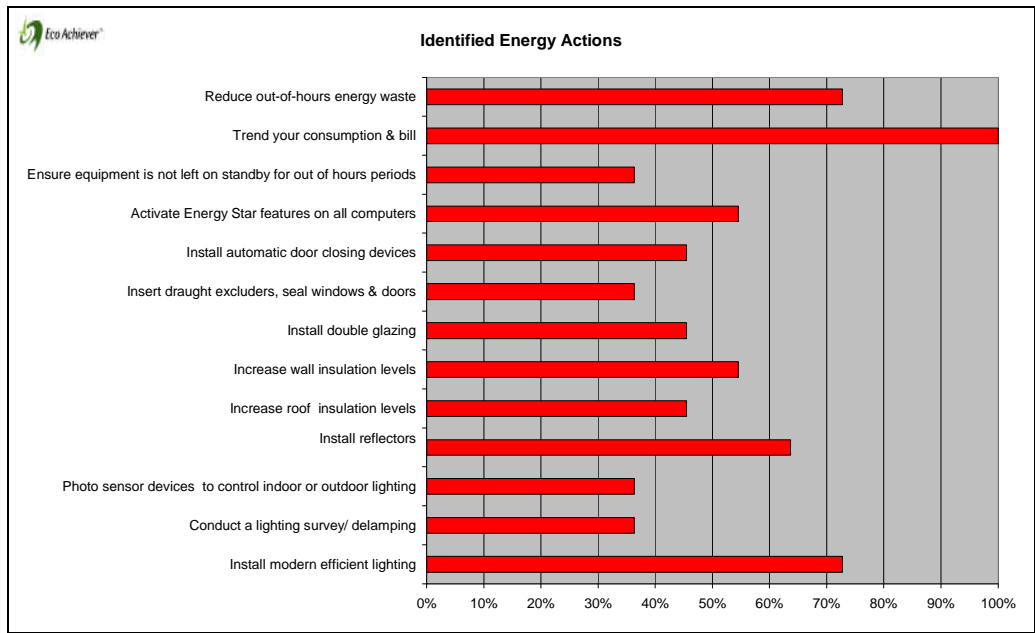


Figure 12. Identified Energy Actions

Water

The most common technical actions identified were to conduct awareness training surrounding water use and waste and to avail of existing schemes available from the utilities. Significant interest in grey water harvesting was expressed, particularly from business that had horticultural elements. Rainwater harvesting did have a high level of awareness, but had limited follow-up due to minimal financial support and nonexistent financial payback. This is exacerbated by the fact that sewage charges dominate the water utility bill with only a minimal contribution as a result of water consumption. The trending of water consumption and associated cost was highlighted in a similar way to waste.

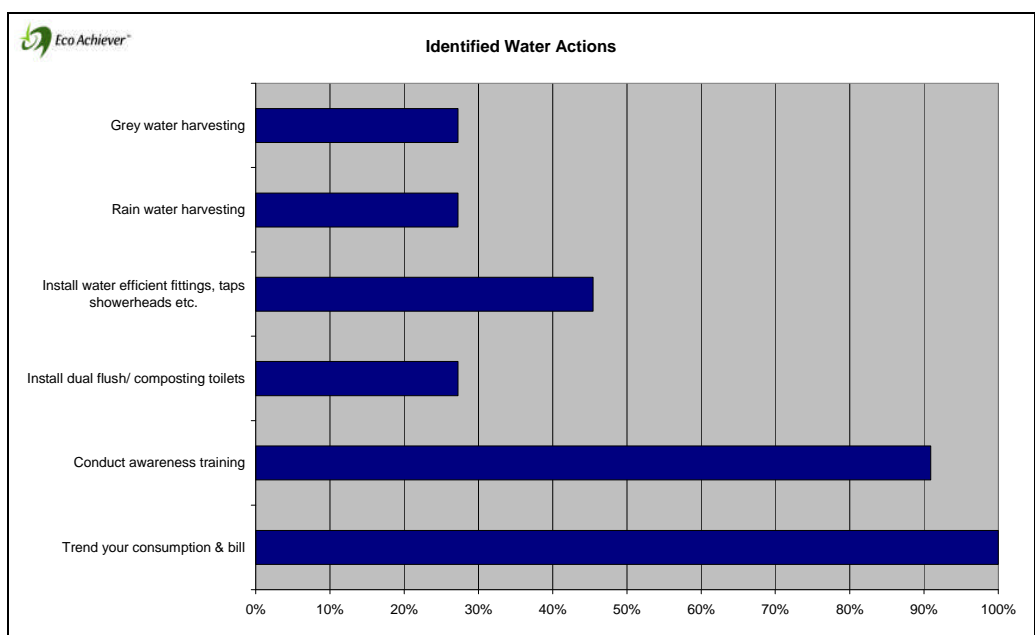


Figure 13. Identified Water Actions

Waste

Given the high existing level of awareness and practices surrounding waste minimisation and management, technical actions in this area are broadly spread. The only universally applicable action was for businesses to record and trend waste generation types, quantities and associated cost. This action will be facilitated by the provision of the trending tool that accommodates energy, water and waste consumption and associated costs.

Issues presented by the disposal of potentially hazardous containers were identified as an opportunity to be brought up with the supplier of the hazardous materials. Take-back schemes may exist with these suppliers, who, as large companies, should be aware of their responsibilities in relation to their products. In the businesses where this action was identified as appropriate, they had not asked their supplier if such schemes were in operation.

The documentation of the disposal of hazardous waste was also highlighted as worthy of attention, particularly when significant effort had already gone into disposing of that waste properly.

Awareness surrounding non-hazardous waste is already very high, so opportunities surrounded the minimisation of the generation of such waste. Reduction of paper materials used in the businesses, reduction of printing and the updating of mailing lists were the principal opportunities in this area.

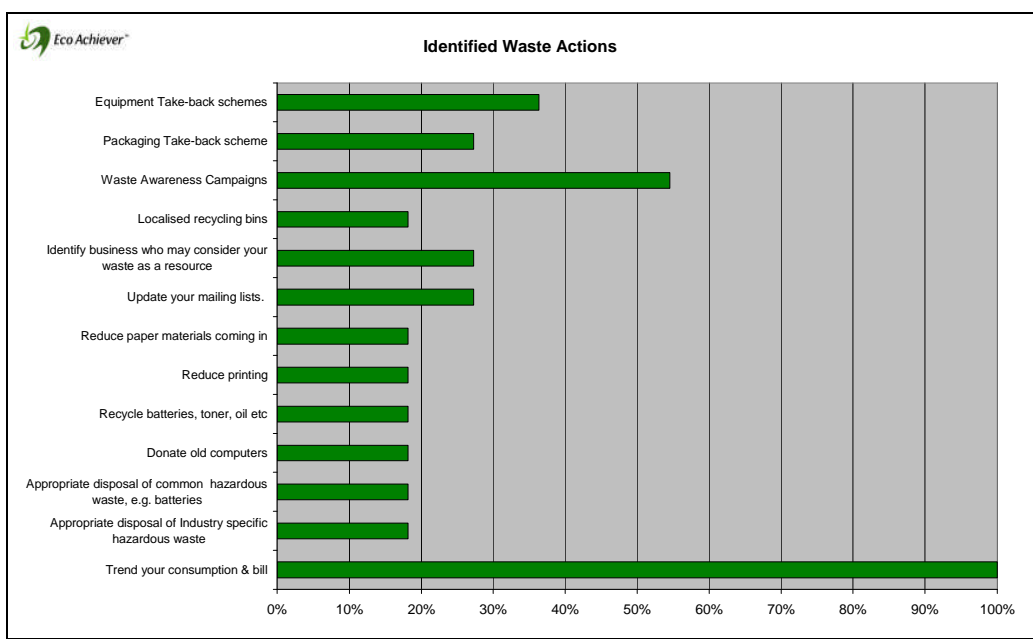


Figure 14. Identified Waste Actions

FEEDBACK

Feedback was sought from the participants regarding their impressions of the audit program, opportunities for improvement and the principle barriers to improving eco-efficiency and necessary supports to overcome these barriers. An example of the feedback form is given in Appendix B.

Of the 11 businesses audited, 7 returned feedback forms. 86% felt the audits were relevant to their business and all would recommend the process to other businesses. Figure 15 below gives an indication of how participants felt the audits influenced their

understanding of their eco efficiency needs. Some participants were unsure that the process had increased their awareness and given them a better understanding of their eco-efficiency needs. The reasons given in the feedback forms indicated that this was due to the fact that the businesses considered themselves to have a very high existing awareness, and that, while the audits touched on all relevant issues, they were aware of them already.

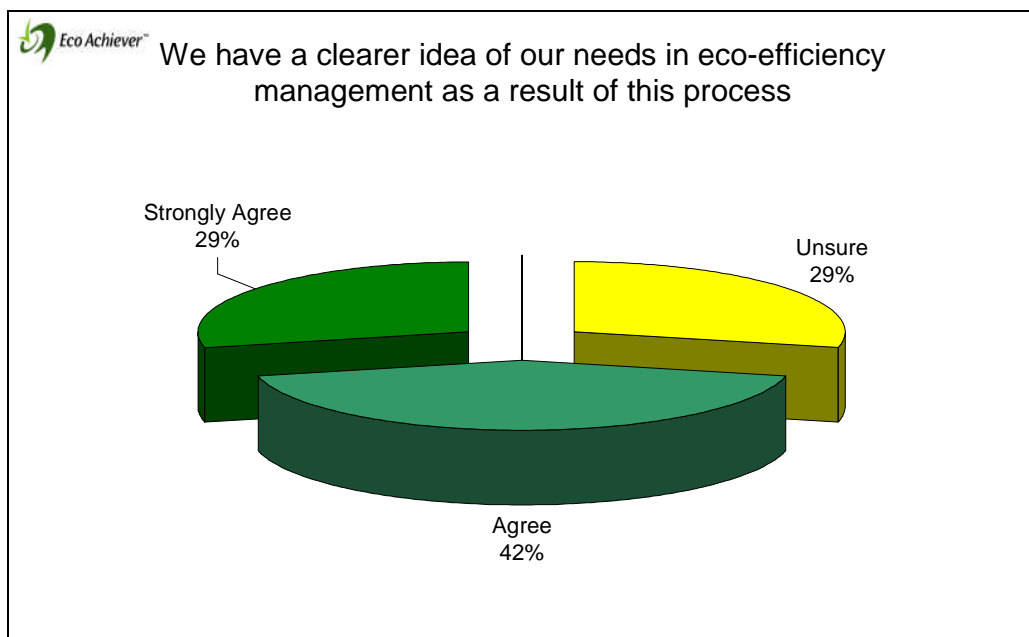


Figure 15. Impact of Audits on Eco Efficiency Understanding

Energy was ranked as the area in which most additional support was required, with water and waste scoring equally after it. This is clearly a reaction to the level of activities surrounding both water and waste in recent years and the larger financial cost associated with energy.

Figure 16 shows that 86% said they would implement some of the identified opportunities within the coming year. Reluctance from some participants was due to the fact that only relatively high cost opportunities were identified as all the “low hanging fruit” had already been identified and implemented by those businesses.

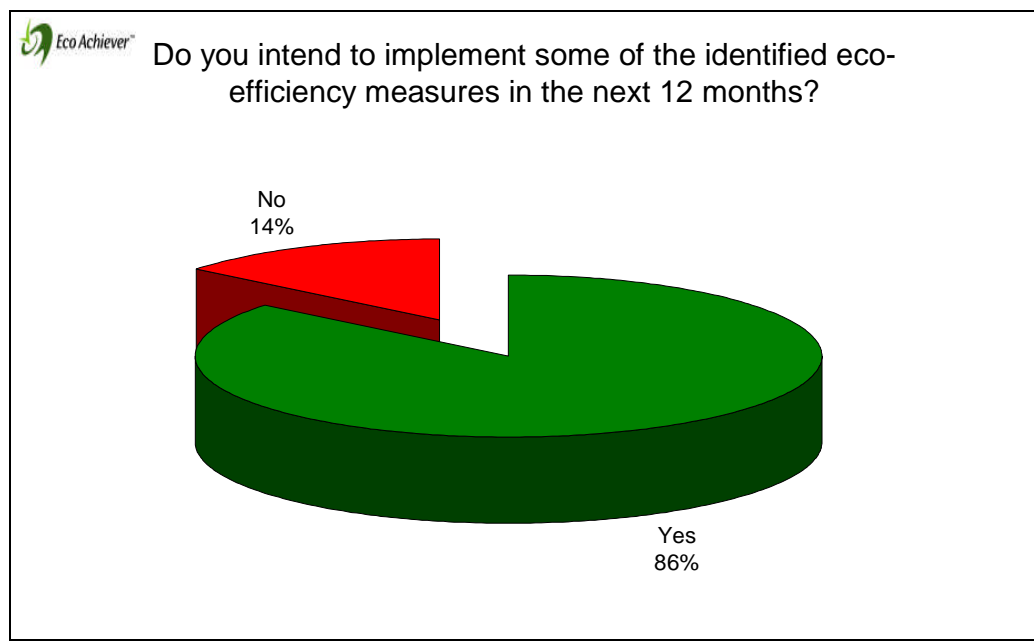


Figure 16. Level of Commitment to Implementing Projects

Eco Achiever was originally designed for Small to Medium Enterprises⁴, with a focus on documented procedures and lines of communication within a business. Given that micro businesses have less than 5 people, some of the questions were pitched at too high level for these businesses and were in areas of less importance. However at sites with multiple users, e.g. public buildings, the focus on communications and documented procedures was pertinent and well received.

The principle advantage participants found from the audits was the opportunity to discuss their operations with an outside individual. This allowed for new ideas to be identified as well as existing good practice to be recognised.

The principle shortcoming of the audits was considered to be a lack of detail surrounding the accessing of specific opportunities, particularly in areas that were already well understood. Good examples are some of the recommendations surrounding waste. The participants knew these issues, but the lack of a specific outlet or identified solution was frustrating for them.

The trending tool was well received, and was cited as a delivery of a practical solution.

Principle Barriers

The principle barriers identified were:

1. Cost of implementing further opportunities.

Given the high level of awareness, quite often the “low hanging fruit” had already been implemented, with significant capital expenditure required for such measures as solar water heating or retrofitting insulation

2. Service availability.

⁴ Small to Medium Enterprises (SMEs) are defined by the Australian Bureau of Statistics as businesses employing 20 or more people, but less than 200 people.

The distance of Lawson from Sydney frequently means that when suppliers are requested to come and quote for systems such as solar hot water heaters, they frequently refuse, as the distance they would have to travel would not be justified if they failed to get the job.

Principle Requested supports

The principle supports requested to advance eco-efficiency were

1. Subsidies for economically marginal activities, to enhance their attractiveness and encourage implementation
2. Identification of reputable suppliers, to allow for easier estimation of cost and implementation

3. Way Forward

AWARENESS

The aggregated diagnostic results in Figure 11 indicate a relatively high level of awareness surrounding waste and water issues. This is unsurprising given the level of activity in these areas in the past few years, in tandem with the World Heritage status of the locality. Availability of recycling services to commercial enterprises is of concern, as is the range of options available for the disposal of potentially hazardous waste, electronic and electrical waste in particular.

Apart from the major public buildings, water use is limited and the economic case for expensive water efficiency measures is not present.

Awareness of energy issues is the poorest of the three and, while enthusiasm levels are high, availability of appropriate information and service suppliers is limited. This area was also ranked as the most in need of additional support with respect to eco efficiency in the feedback from the participating businesses.

OPPORTUNITIES

Opportunities for improving Eco-efficiency in the Lawson area are outlined below:

1. Some businesses had specialist waste management systems in place for regulatory reasons. They were willing to consider others using these systems, e.g. specialist bins for waste metal collection. Some already did as they were paid by bin content. Others weren't and while willing to allow other to use the system, were not prepared to handle administration. A solution would need to be coordinated by the council, business, waste contractor or a new third party.
2. The relationship between the council and the Community centre had a discontinuity between building owners and maintainers and the building operators, who paid for energy water and waste costs. Measures to improve energy efficiency via timers will be a cost to the council, while the benefits will be received by operators, voluntary groups etc. This disparity leads to inefficient operation. While the centre's energy water and waste budgets are small in absolute terms, the mirroring of this scenario in community buildings throughout the Blue Mountains Council area represents a significant amount of consumption and addressing this discontinuity would represent a significant opportunity.
3. Waste generated by some business could provide raw materials or even fuel sources for others. Individuals had made efforts to advertise the availability of such resources, but had failed to identify takers. Opportunity for BMCC or a third party maybe to create a website to inform businesses to aid in closing the loop
4. Improved insulation and lighting were identified as the most significant technical opportunities with respect to energy. There is an opportunity for BMCC to encourage a supplier to provide assessments and quotations to a number of potential customers. Grants or rebates for increased insulation would represent the most cost effective energy efficiency measure for the Lawson area.

5. Solar hot water heating that was identified as a significant opportunity for a number of sites, need grants or rebates. Individuals are willing to spend their own money, but there is insufficient information regarding cost of installation, service availability or expected performance. The BMCC could act as a central clearinghouse for requests regarding solar energy in Lawson and approach a contractor with a bulk buy. This would encourage service providers who may not service the area on a job-by-job basis.
6. The participants liked the idea of a scheme to identify ecologically responsible businesses within the area. Participants could be identified by the grant permission to use a logo or similar Public Relations based initiative. Concerns were expressed about how enforceable and regularly audited it should be to maintain creditability.
7. The influence of fixed sewage service charges represents a limiting factor in implementing water conservation measures. A review of policy with respect to the role of fixed charges limiting consumption savings could be undertaken by the BMWHI.

Appendix A. Sample Report



*Sample Ltd
Eco-efficiency Report*

Prepared For:
Brian Dwyer
Eco Achiever Completed:
Friday, 9 February, 2007
Next Eco Achiever Recommended:
Friday, 10 August, 2007



Visit www.energetics.com.au
Eco Achiever should be repeated every 6 months to
validate office actions, as they will continue to improve
your Eco-efficiency.

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Introduction & Acknowledgement



INTRODUCTION AND ACKNOWLEDGEMENT

This Program is a joint initiative between the Blue Mountains World Heritage Institute (WHI), Blue Mountains City Council (BMCC) and Integral Energy. The Program is aimed at increasing productivity of resources, reducing environmental impacts and achieving cost savings for businesses operating in the Lawson area of the Blue Mountains.

The Program partners thank Sample Ltd. for your participation and for your commitment to better environmental efficiency. This Action Plan has been prepared based on a review of your company's management practices and operating practices related to energy, water and waste efficiency. It identifies management and technical or operating improvements that you can make to achieve improved environmental and financial outcomes in these areas.

SITE DESCRIPTION

Sample Limited is a business located in the Lawson Industrial Estate. It principle items of equipment consist of an air compressor, and extraction fan. It has AAA water fixtures and practices recycling of standard waste. Toxic waste in the form of mineral oil is disposed of by sending it to the local automotive centre who accepts it for disposal.

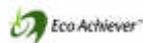
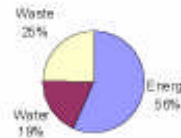
CURRENT ENERGY, WATER AND WASTE PROFILE

Based on information you have provided, we understand your current resource consumption profile, or "baseline" is as follows.

Environmental Costs

Sector	Charge
Energy	\$ 4,567
Water	\$ 1,500
Waste	\$ 2,000
Total	\$ 8,067

Environmental Charges



Section 1 - Executive Summary



Eco Achiever is designed to help you:

- Identify business issues related to Eco-efficiency.
- Assess your Eco-efficiency management.
- Provide you with critical actions for improving your management of Eco-efficiency. These actions are designed for you to build effective systems for managing Eco-efficiency so that savings achieved are sustainable.

About this Report:

This report summarises how you currently manage Eco-efficiency and includes:

1. Executive Summary.
2. Your Eco Achiever Results.
3. Your Critical Actions.

The Eco Achiever Rating Scale:

The Eco Achiever rating provides a benchmarking tool to gauge your organisation's Eco-efficiency systems performance against other businesses. The rating system is represented by traffic lights:

	"Got it Right"	Your organisation has developed formal systems for managing Eco-efficiency.
	"Room for Improvement"	Your organisation has made substantial progress in developing processes for managing Eco-efficiency.
	"Needs Attention"	Your organisation has started to address managing Eco-efficiency and reducing obvious wastage.
	"Not Considered Yet"	Your organisation has yet to address the management of Eco-efficiency.

Eco Achiever should be repeated every 6 months to update critical actions, so that you continue to improve your Eco-efficiency.

Section 1 - Executive Summary

Your Overall Eco Achiever Rating is: ● "Needs Attention"

Your Annual Eco-efficiency Cost Summary

Energy Consumption (Select)	0
Energy Charges	\$4,578
Water Consumption (Select)	0
Water Charges	\$1,500
Waste Generation (Select)	0
Waste Charges	\$2,000
Total Charges	-\$8,078

Eco Achiever should be repeated every 6 months to update critical actions, so that you continue to improve your Eco-efficiency.

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Section 2 - Your Results

Element	Not Yet Considered	Needs Attention	Room for Improvement	Got it Right	Critical
1. Leadership		●			Critical
2. Accountabilities			●		
3. Awareness and Training				●	
4. Understanding		●			Critical
5. Energy Management	○				Critical
6. Water Management	○				Critical
7. Waste Management				●	
8. Planning		●			Critical
9. Targets and KPIs	○				
10. Budgets and Purchasing	○				
11. Operations and Maintenance			●		
12. Innovation				●	
13. Metering and Monitoring		●			
14. Reporting	○				
15. Achievement		●			

Eco Achiever should be repeated every 6 months to update critical actions, so that you continue to improve your Eco-efficiency.

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Section 3 - Your Critical Actions

Module and Achievement	Status	Recommended Action	Whom	When
1. Leadership	●	Have your owner/plant manager prepare and sign a written commitment to improving Eco-efficiency (e.g. join a government program or incorporate energy, water and waste	Brian Dwyer	Apr-07
4. Understanding	●	Conduct a review to identify opportunities to improve Eco-efficiency in resource intensive processes/facilities (e.g. complete an Eco-efficiency audit).	Brian Dwyer	Apr-07
5. Energy Management	○	Assess the opportunities for implementing/installing energy saving devices in your business (e.g. VSDs, timer controls on lights/air conditioning).	Brian Dwyer	Apr-07
6. Water Management	○	Assess the opportunities for implementing/installing water saving devices in your business (e.g. dual flush toilets, trigger hoses, sweeping floors instead of hosing).	Brian Dwyer	Apr-07
8. Planning	●	Develop a list of Eco-efficiency opportunities for implementation this year.	Brian Dwyer	Apr-07

Eco Achievers should be repeated every 6 months to update critical actions so that you continue to improve your Eco-efficiency.

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Sample Report No. 000000

Technical Actions

Energy	Opportunity	Typical Payback	Comments and/or Recommendation
	Install modern efficient lighting	1-3 years	Modern Lighting is significantly more efficient than lighting even as little as 10 years old
	Conduct a lighting survey/ delamping	<1 year	Many areas are over lit for the task performed. Conducting a lighting survey can establish existing lighting level and allow for the identification of light fittings that could be removed.
	Install reflectors	1-3 years	Reflectors can lose their abilities over time. Replacing reflectors can restore the power of the light fittings.
Recommendation. Install low voltage down lights in the office area. This will reduce your power consumption in this area by 30%.			
HVAC & Heating	Increase roof insulation levels	1-3 years	30% of heat in winter lost through the roof. Will also decrease cooling load in summer.
	Purchase energy efficient systems	>3 years	Modern air conditioning systems can be significantly more efficient than older systems.
Recommendation. Ask your landlord to cover some of the cost for increased insulation in the office area. Insulation will reduce energy consumption and improve comfort levels.			
Office equipment	Activate Energy Star features on all computers	<1 year	A significant leadership project, energy savings likely to be modest.
	Ensure equipment is not left on standby for out of hours periods	<1 year	Devices can consume 20% of full operating power when on standby. Ensuring they are shut off at night can significantly reduce costs.
Compressed air	Conduct a air leak survey & repair leaks	<1 year	Air leaks reduce performance of pneumatically operated equipment as well as increase running costs.

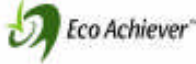
Sample Ltd Technical Actions
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Technical Actions			
Energy	Opportunity	Typical Payback	Comments and/or Recommendation
All Areas	Trend your consumption & bill	<1 year	This will allow you to be aware of your consumption and detect any significant changes and act to avoid their continuance. A trending tool has been provided with this audit.
	Reduce out-of-hours energy waste	1-3 years	Checklist & Training for staff/cleaners/security to turn off unused equipment. Put up signage to remind staff & yourself of waste avoidance measures. Resources for this are available at many of the utilities websites.
Electric Motors	Check tension on belt drives	<1 year	Slippage of belt drives can cause your motor to work harder than necessary. Regular inspect these drives to ensure effective performance.
Recommendation, Signage and checklists will assist the various users to minimise wastage. Trending of performance allows participants to see the impact of measures and rewards their efforts.			


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Technical Actions			
Water	Opportunity	Typical Payback	Comments and/or Recommendation
All Areas	Trend your consumption & bill	<1 year	This will allow you to be aware of your consumption and detect any significant changes and act to avoid their continuance. A trending tool has been provided with this audit.
	Contact awareness training	1-3 years	Checklist & Training for staff/cleaners/security to turn off unused equipment. Put up signage to remind staff & yourself of waste avoidance measures. Resources for this are available at many of the utilities websites.
Recommendation, Signage and checklists will assist the various users to minimise wastage. Trending of performance allows participants to see the impact of measures and rewards their efforts.			

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Technical Actions



Waste	Opportunity	Typical Payback	Comments and/or Recommendation
	Trend your consumption & bill	<1 year	This will allow you to be aware of your consumption and detect any significant changes and act to avoid their continuance. A trending tool has been provided with this audit.
	Develop appropriate system to dispose of other hazardous waste		Other hazardous wastes include electrical goods (computers, batteries, etc.). Disposing of these wastes with general waste poses significant environmental /soil impacts.
	Identify business who may consider your waste as a resource	<1 year	E.g. shredded waste paper can be used as animal bedding or packing material.
	Waste Awareness Campaigns	<1 year	Run an awareness campaign to clarify what can be recycled (e.g. greasy pizza boxes, milk cartons).
	Take-back scheme		Consider whether suppliers have a take-back scheme for packaging. For example for toner packaging.
	Take-back schemes		Consider whether equipment suppliers have a take-back scheme for recycling.

Recommendation: Signage and checklists will assist the various users to minimise wastage. Trending of performance allows participants to see the impact of measures and rewards their efforts. Ask suppliers of paints and solvents to take back the containers. Advertise unwanted off-cuts as free firewood or source materials for other crafts people.

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Useful Websites



Energy

Staff awareness materials
<http://www.eco-achiever.com.au/whb/eco/energy/energyawareness.htm>

Energy Efficient Lighting Calculator
<http://www.enersys.com.au/eco/energy/energyefficient.htm>

Compressed Air Savings Calculator
<http://www.enersys.com.au/eco/energy/compressedair.htm>
 Tel: 70667130 & Page 17-18

Water

Staff awareness
<http://www.enersys.com.au/whb/eco/water/waterawareness.htm>

Waste

Bubble Wrap
 Australian Chamber of Commerce & Industry Eco-efficiency Newsletter
http://www.acci.com.au/text_files/TooEfficient/Newsletters/Edition%202008%20September%202008.pdf

Information & Staff Awareness
<http://www.bmcc.nsw.gov.au/council/energy/waste/awareness/awareness.htm>

Environmental Protection Agency Industry Partnership Program
<http://www.epa.nsw.gov.au/industry/partnership.htm>

Note: Neither Energetics nor the Blue Mountains World Heritage Institute endorse the content of any of the websites on this list. Information does not represent a recommendation by Energetics and users of this list should make their own decisions regarding the quality & validity of the websites' content.

Appendix B. Feedback Form

Eco Achiever Feed Back Form

Your participation in the Eco-Achiever program is appreciated. In order to establish how well the program has been received, and how it could be improved we would be grateful if you could complete this feedback form. This form can be filled in electronically and the edited version emailed to Brian Dwyer at dwyerb@energetics.com.au or printed and faxed to (02)9929 3922.

	Strongly Disagree		Strongly Agree		
	1	2	3	4	5
1. The program enhanced our understanding of our eco-efficiency management practices.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. We have a clearer idea of our needs in eco-efficiency management as a result of this process.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. This is a valuable program for helping us to improve our eco-efficiency management.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. We found the program relevant to our business.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Do you intend to implement some of the identified eco-efficiency measures in the next 12 months?	Yes		No		
6. Would you recommend this process to other businesses?	Yes		No		
7. What did you find most helpful about this program?					
8. What did you find least helpful about this program?					
9. What opportunity or initiative would most benefit your business if implemented?					
10. How do you think this process could be improved to reflect your business's needs					
11. Please rank the area you feel more assistance would assist your business to be more eco-efficient	Energy Water Waste				
12. What are the main three barriers to your business implementing eco-efficient measures	1. 2. 3.				
13. What type and level of assistance or support would your business benefit from most in relation to the barriers you have identified	1. 2. 3.				