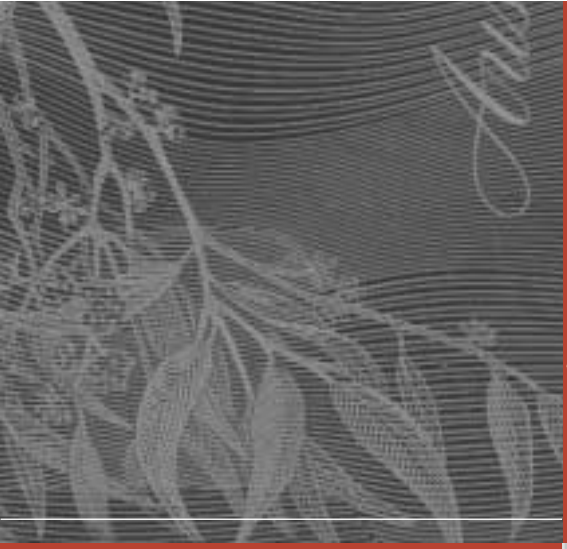

Profiting *from* Environmental Improvement *in* Business

AN ECO-EFFICIENCY
INFORMATION KIT
FOR AUSTRALIAN INDUSTRY

How can my business *profit from* environmental improvements?

Financial

- cost savings;
- increased efficiency and competitiveness;
- reduced waste treatment costs;
- less expenditure on raw materials, energy and water;
- reduced environmental liability; and
- new market opportunities for 'green' goods and services.

Environmental

- reduced environmental impacts;
- reduced pollution and waste;
- reduced use of natural resources; and
- reduced use of toxic chemicals.

Social

- better worker Occupational Health and Safety;
- better public image;
- better relations with the community; and
- better relations with regulators.

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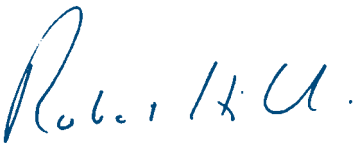
Foreword

In Australia and around the world, governments are providing encouragement and assistance to industry to improve its environmental performance, while at the same time, fostering improved competitiveness and profitability. Increasingly, experience is showing that the dual aims of economic growth and environmental protection can be met by improving the environmental efficiency of business. By reducing environmental impacts and cutting waste, business operators can *improve their productivity and save money*.

This booklet has been developed by Environment Australia to assist Australian businesses to use environmental initiatives to improve their bottom line. The tools and approaches outlined in this booklet can be used by businesses to improve both their financial standing and their environment, providing broad benefits for all Australian society.



SENATOR ROBERT HILL
Minister for the Environment and Heritage

About This Booklet

This booklet provides a reference point for businesses that wish to embark upon environmental improvements, but need more information to start. It is aimed primarily at medium to large sized enterprises, but will be useful to other organisations, including industry associations and government agencies. The booklet will also be helpful to smaller businesses, which can modify the tools presented in such a way as to be appropriate to their size and scale.

The booklet explains some of the common terms used in environment management, and aims to demystify some of the concepts involved. It discusses the relationship between eco-efficiency and cleaner production, and describes a number of tools that businesses can use to improve their environmental management.

The booklet also provides relevant contacts for companies wishing to further investigate particular initiatives.

Acknowledgements

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Australian Chamber of Commerce and Industry
Australian Industry Group
Business Council of Australia
Department of Industry, Science and Resources
New South Wales Environment Protection Authority
Victorian Environment Protection Authority

Contents

Eco-efficiency: A New Approach to Environmental Management

ECO-EFFICIENCY IS A combination of economic and ecological efficiency, and is basically about 'doing more with less'. Eco-efficiency means producing more goods and services with less energy and fewer natural resources, resulting in less waste and pollution. Promoted by the *World Business Council for Sustainable Development*[1] *(WBCSD)*, eco-efficiency provides a means for businesses to pursue development that is sustainable both economically and environmentally. The concept of eco-efficiency is also being promoted within the OECD and in other international fora.

Eco-efficiency and Cleaner Production

Eco-efficiency is a relatively new term for Australian businesses, which may be more familiar with such concepts as waste reduction, pollution prevention, and cleaner production. In particular, cleaner production has been popular with both governments and industry as a means to improve the environmental aspects of business operations.

Cleaner production and eco-efficiency are closely linked. Cleaner production might be seen as a mechanism for improving environmental outcomes, which can also result in financial benefits. Eco-efficiency, however, focuses more closely on improving business outcomes, through the use of improved environmental management and resource efficiency. Eco-efficiency directly links environmental performance to financial performance – if a process is made more

[1] *The WBCSD is a coalition of over 120 international companies, which is committed to the environment as well as economic growth. With members drawn from 35 countries, including Australia, and over 20 major industrial sectors, the WBCSD is a powerful international voice for the interests of business. The Business Council of Australia (BCA) is a partner organisation.*

efficient, then both financial and environmental benefits will follow.

Eco-efficiency emphasises the creation of value, both for the producer and the consumer, for example, by:

- **minimising costs for raw materials, water and energy, and minimising reject product, waste and pollution; and**
- **making a product or service more desirable to consumers, either because the environmental impacts of its production have been minimised, or because its environmental impacts and running costs post-sale have been reduced.**

Eco-efficiency is very much an evolving concept in Australia, which will continue to be discussed and redefined. While there is still academic debate on the differences between cleaner production and eco-efficiency, remember that for practical purposes, it is not the theory but the outcomes that are important.

The Benefits of Eco-efficiency

Including environmental management as an integral part of business operations can improve business profitability. For example, pollution can be a costly problem, requiring expensive end-of-pipe technologies or the payment of discharge or dumping fees. In some cases, organisations that produce waste may breach environmental regulations. The generation of waste may also indicate inefficiencies in the production process itself, thus requiring greater amounts of raw materials than necessary.

Recognising these costs, many companies are developing innovative ways to reduce their waste. Some companies are re-using waste on-site, and even selling parts of their waste stream for other manufacturing processes and uses. Some other approaches being undertaken include:

- preventing and minimising the production of pollution (eg. discharges to air, land and water, hazardous waste);
- improving housekeeping (eg. avoiding leaks and spills, better monitoring and better training of employees);
- substituting materials (eg. replacing toxic solvent based coatings with water based ones); and
- changing processes (eg. mechanical cleaning, re-design products to use materials more efficiently).

In addition to financial benefits, sound environmental management can also bring other advantages. A strong environmental record can improve a company's relations with environmental regulators and the broader community. Financiers and insurers are also becoming increasingly aware of the liabilities and risks associated with environmental incidents. Finally, better environmental management can improve staff morale, through improved occupational health and safety, and also the opportunity for staff to contribute to environment protection initiatives.

The principles of eco-efficiency can apply to organisations large and small, and can be implemented in stages. In some cases, even small process changes can lead to significant benefits. Over the past few years, Environment Australia and State environment protection agencies have collected over 100 case studies of companies that have implemented environmental improvements[2]. These case

[2] *See the Eco-efficiency and Cleaner Production Homepage (http://www.environment.gov.au/epg/environet/eecp/) for details of these companies' initiatives and the benefits they gained.*

studies have come from a range of industry sectors, including agriculture, food, manufacturing, petrochemical, construction, retail and finance.

For these case studies, the average time taken to pay back the initial up-front costs was just over one and a half years. Just over one third had a payback period of less than six months. The amount invested varied from one company to another. Some simply made process optimising changes of minimal to no cost that resulted in tens to hundreds of thousands of dollars in annual savings. Some examples of what Australian companies have achieved through environmental improvements are distributed throughout this booklet.

Where to Start?

While there are a multitude of tools available for businesses wishing to improve their environmental performance, it may be difficult for individual companies to determine which approach is best for their specific circumstances and resources. This booklet provides a starting point. Once you have decided which initiatives you are interested in pursuing, there are a wide range of resources available for further investigation. Some of

Case Study

Bonlac Foods *(Large Company)*

Bonlac Foods Ltd **produces dairy products including cheese, butter and milk powders. It is Australia's largest dairy manufacturer, with an annual turnover of over $1 billion, and exports to more than 50 countries.** ***Bonlac*** **has implemented a range of efficiency and environmental improvements including:**

- **Changing the chemical used in their cleaning process. This resulted in less acid use in cleaning, reduced cleaning time therefore extra production time, and reduced consumption of water and electricity. Net savings are $97,000 per year.**
- **Screens and a settling tank were installed to recover waste solids from the washing process used in the cheese room. The capital cost of this was $30,500 and the savings are $100,000 per year, hence a payback period of less than 4 months.**
- **Diverting some of the less contaminated waste water streams to irrigate neighbouring farmlands (these streams were relatively clean and free from significant quantities of suspended or dissolved solids). This resulted in a reduction of up to 30% of effluent having to be processed by the wastewater treatment plant.**

"We decided that the best way of reducing waste entering a drainage system was to convert more of our raw material into saleable product. This not only makes our processes more efficient but gives us increased product yields, which impacts directly on the bottom line."

LLEW SANDFORD
Environmental Manager, Bonlac Foods.

these are listed in the 'Further Information' section at the end of this booklet.

Options for improving your eco-efficiency can also be identified by seeking professional advice and undertaking an environmental or energy audit. Also, consulting with your staff can be one of the best sources of ideas for improvements in the workplace.

It is not expected that business should adopt and pursue a multitude of different environmental measures. Businesses should choose which approach suits their circumstances best. Ultimately, no matter what approach is chosen, it is important to remember that the tools described here are exactly that: tools. They should not be viewed as ends in themselves, but simply, as a means to the ultimate goal of improving business efficiency, product quality and profit through improved environmental management.

case study

GT Motors Panel Beating and Spray Painting *(Small Company)*

GT Motors is a small panel beating and spray painting workshop established in 1964, with a current workforce of four. They repair and refinish approximately 30 cars a month. Over the years they have implemented a number of environmentally sound and cost effective projects, including:

- **Using High Volume Low Pressure (HVLP) Spray Guns to reduce paint waste. Substantial savings (25-35% depending on the job) in the consumption and cost of paint and thinners has resulted in cost savings of between $7,500 to $10,500 for a company incurring $30,000 in paint and thinners costs each year.**
- **Upgrading its spray booth and baking oven to a booth with improved airflow, heating and water-scrubbing facilities. This has reduced exhaust emission of volatile organic compounds and paint particulates to the surrounding environment.**
- **Installing skylight roofing to take advantage of natural light. Seventeen of the nineteen fluorescent lamps in the workshop are switched off during the working hours except for rainy or cloudy days, resulting in savings of $205 per year.**

These changes have also resulted in a cleaner and safer work environment for *GT Motors* staff and increased productivity. *GT Motors* has a number of further projects in train including installing a triple interceptor silt trap to filter wash down and wet sanding waters draining to the sewer and using compressed air tools connected to a dust extraction system for dry sanding and polishing.

Environment Management Tools

THERE ARE A NUMBER OF useful management tools available that can assist businesses with improving efficiency and environmental performance. Some are well developed and have been used extensively in Australia and overseas with significant benefits to those organisations that adopt them. Other tools are still being developed, but it is important to be aware of them so as to be prepared to take advantage of their use when they become available.

Examples of environment management tools include:

- Environmental Auditing
- Environmental Management Systems (EMS)
- ISO 14000
- Life Cycle Assessment (LCA)
- Environment Reporting
- Environment Accounting
- Design for Environment
- Supply Chain Management
- Performance Based Contracting

Each of these tools has been shown to assist with improving efficiency and environmental performance. While the tools may come with some costs, they can also provide opportunities for financial savings and other benefits.

These tools can be interrelated and support each other to some degree. For example, in designing a product to maximise its quality and environmental performance (design for environment), it may be useful to undertake an assessment of all its material inputs and production processes (life cycle assessment). Likewise, information gathered about a company's resource inputs, goods produced and waste generated (environmental auditing)

can be used to develop a plan for managing environmental impacts (EMS).

What follows is some background information on each of these tools, including a summary of the concept, application and current activities in Australia.

Environmental Auditing

An environmental audit is a means by which companies can assess the environmental impacts of their operations. At its core is the measurement and evaluation of all inputs to and outputs from a production process. Without this information, any other attempt at environmental improvement is likely to be ineffective: only when impacts are identified and measured can a company determine what areas to focus on, and what results it is getting for its measures. For this reason, an environmental audit will generally provide the starting point for any other environmental measures.

An audit can also provide a valuable tool for companies both in performance management and in planning. It can be an effective risk management tool for assessing compliance with environmental legislation, and can also be used to identify areas for improvements and efficiencies.

Components of an Audit

A good audit will include a number of components, some of which are listed below.

Data Collection: The first and most important component of an audit is the identification and measurement of all inputs to and outputs from the production process. This information provides a baseline for comparison against targets and a background for improvement.

Compliance: A good audit will include a review of all targets, including relevant regulations and internal policies. Data gathered during the measurement stage can be compared against these targets, to assess compliance.

Documentation: All aspects of the audit should be documented, including environmental impacts, targets and opportunities identified for further improvement. This documentation is useful for assessing progress at a further date, and also in verifying environmental performance to staff, regulators and the general community.

Verification: Depending on the size and complexity of the organisation, independent verification may be sought, for example, through an environmental consultant or certified auditor. For a company with small environmental impacts, where the likelihood of prosecution under legislation is remote, an audit may be performed simply to identify potential improvements in efficiency, and might therefore be carried out in-house.

Periodic: To increase their usefulness in both risk and performance management, environmental audits should be carried out periodically. This will enable a company to assess the likely impacts of new or changed legislation on their operations, for example, whether their environmental performance will measure up to proposed new standards, and also, to assess whether internal targets for environmental efficiency are being met.

Benefits

An environmental audit can highlight areas of inefficiency in processes, for example, where the amount of resources used are out of proportion to the amount of saleable items or services produced. It can also highlight excessive waste, providing an opportunity for a business to

decrease its waste output and thus decrease costs of waste treatment and disposal.

An environmental audit can be modified according to the size and complexity of a business. For example, a small business may simply concentrate on such things as paper usage, and water and energy consumed, whereas a large scale organisation may have a broader range of inputs and outputs to be quantified.

An environmental audit can give a company a much clearer, fact-based understanding of its operations and impacts, and ultimately, provides a starting point for other environmental initiatives.

Environmental Management Systems

An environmental management system (EMS) is a system which companies set in place to manage their environmental impacts, both current and future. Like a financial management system monitors expenditure and income and enables regular checks of a company's financial performance, an EMS monitors environmental performance. An EMS integrates environmental management into a company's daily operations, long term planning and other quality management systems.

It is up to individual organisations to decide whether an EMS is an appropriate approach for their environmental management, and if so, what size and complexity should be involved. Smaller companies may develop simple plans for managing their key environmental impacts. Larger companies may develop a comprehensive EMS, and may also consider seeking certification under the international standard ISO 14001 (see ISO 14000 section).

Components of an EMS

The most important component of an EMS is organisational commitment. For an effective EMS to be developed and implemented, you need commitment from the very top of the organisation, as well as all staff. Following are further examples of components that should be considered when developing an EMS.

Environmental Policy: This is a statement of what an organisation intends to achieve from an EMS. It ensures all environmental activities are consistent with the organisation's objectives.

Environmental Impact Identification: Identification and documentation of the actual and potential environmental impacts of an organisation's operations need to be undertaken. This can be achieved through undertaking an environmental audit.

Objectives and Targets: An environmental audit forms the basis of determining an organisation's environmental objectives and targets. An organisation can find benefits in adopting more stringent longer term objectives to encourage it to improve its performance. To continually improve, targets should be regularly reviewed.

Consultation: Staff and community consultation should be undertaken before, during and after establishment of an EMS. This is necessary to ensure that all staff are involved in, and committed to the EMS. It can also help to improve public perception of the company, one of the benefits of implementing an EMS.

Operational and Emergency Procedures: All procedures should be reviewed to ensure they are compatible with the organisation's environmental objectives and targets. Any changes should be included with the documentation.

EMS for a Sewage Treatment Plant

The Lower Molonglo Water Quality Control Centre (LMWQCC) **is an advanced wastewater treatment facility servicing Canberra's 310,000 residents. Operated by the *ACTEW Corporation*, it provides tertiary treatment to produce a high quality effluent, which discharges into the Molonglo River. From there the waters drain into the Murrumbidgee River and Murray Darling Basin river system. Effective treatment is therefore essential to maintain safe water for downstream communities and the health of one of Australia's main river systems.**

The LMWQCC **has an EMS that is integrated with its Quality System. It was one of the first organisations in Australia to obtain certification to the ISO 14001 standard. The key objectives of the EMS are to:**

- **identify and manage potentially significant environmental impacts of its operations;**
- **maintain the ecological health of the receiving waters;**
- **promote sustainable management and waste minimisation; and**
- **promote community consultation.**

A key feature of the EMS is the Environmental Management Plan (EMP). The EMP is developed from LMWQCC's environmental objectives and targets. It incorporates an action plan and performance measures which provide the basis of a continuous improvement program. The EMP is reviewed annually, with monthly status reports submitted to management, to ensure that objectives and targets are achieved.

Some examples of recent environmental improvements include:

- **construction of a storage dam to avoid bypass of partially treated effluent during high flows or plant downtime;**
- **Phosphorous reduction through use of an industrial pickle liquor waste product to assist in precipitation;**
- **in-process monitoring to enable real time corrective action; and**
- **incineration of sludge, which is sold as agricultural soil conditioner.**

The EMS has played an important role in enhancing management and staff performance. It provides a clear framework for decision making, risk taking and continual improvement. The wide acceptance of the EMS and contribution from all levels of staff has been a key feature of the LMWQCC's success with achieving environmental objectives and regulatory requirements.

Under the EMS regime, the LMWQCC has achieved 100% compliance with its environmental licence for effluent for over two years. They have undertaken extensive monitoring in the area surrounding the outlet and downstream from the plant, including biological monitoring of fish, birdlife, platypus and other aquatic vertebrates. Results have shown that there has been no significant environmental impact resulting from the waste treatment facility.

"The EMS has made a key contribution in the successful management of a complex environmental function operating under stringent licence conditions. This has enabled LMWQCC to achieve 100% compliance requirements, and in return protect the needs of the downstream aquatic environment."
Ron Hogg, Environmental Manager, LMWQCC

Environmental Management Plan: This details the methods and procedures which an organisation will use to meet its objectives and targets.

Documentation: All objectives, targets, policies, responsibilities and procedures should be documented along with information on environmental performance. Documentation is useful for verifying environmental performance to staff, regulators and the community.

Responsibilities and Reporting Structure: Responsibilities need to be allocated to staff and management to ensure the EMS is implemented effectively.

Training: Staff should undergo environmental awareness training to familiarise them with their responsibilities for implementing the EMS and with the overall environmental policy and objectives of the organisation. This provides staff with the necessary skill and motivation for the effective implementation of the EMS.

Review Audits and Monitoring Compliance: Review audits should be undertaken regularly to ensure the EMS is achieving its objectives and to refine operational procedures to meet this goal. In order to ensure regulatory and other requirements are being met, it is often necessary to undertake regular environmental monitoring.

Continual Improvement: An important component is continual improvement. An EMS comes into best use when used to review progress towards the targets and objectives set by a company to protect the environment. The procedures set in place to meet these objectives should be constantly examined to see if they can be improved or if more effective systems can be introduced.

Benefits

An EMS can assist a company in the following ways:

- rationalise resource use;
- assist compliance with regulatory requirements;
- make licences and permits easier to obtain;
- assist a company to meet its own environmental and quality targets;
- improve relations with the local community, customers, and investors; and
- allow greater control of operations and costs.

Continually improving the EMS can also help your company to gain the greatest possible benefit from environment protection.

ISO 14000

The ISO 14000 series, currently being developed by the International Organization for Standardization[3], is a collection of voluntary standards that assists organisations to achieve environmental and financial gains through the implementation of effective environmental management. The standards provide both a model for streamlining environmental management, and guidelines to ensure environmental issues are considered within decision making practices.

In the past, many countries and regional groupings have generated their own standards for environmental issues with varying requirements. The development of the ISO 14000 series allows organisations to focus environmental efforts against an internationally accepted model, and provides a benchmark for measuring the relative environmental claims of companies operating in the global market.

[3] *http://www.iso.ch/*

Many companies already have some experience with the ISO series of standards relating to quality management. Some of the components of the ISO 14000 series include:

ISO 14001: Environmental Management Systems – Specification with Guidance for Use (completed)

ISO 14004: Environmental Management Systems – General Guidelines on Principles, Systems and Supporting Techniques (completed)

ISO 14010-12: Environment Auditing Principles and Procedures for Internal/External Audits (completed)

ISO 14020: Environmental Labels and Declarations – General Principles

ISO 14031: Guidance on Measuring Environmental Performance

ISO 14040: Life Cycle Assessment – Principles and Guidelines

ISO 14041-43: Life Cycle Analysis – Goal, Scope and Analysis; Impact Assessment; Interpretation.

The standards are all at varying stages of development and more will be published in the future. Many large businesses, particularly overseas, have obtained certification under the ISO 14001 standard for environmental management systems.

The ISO 14000 series is particularly useful for assisting businesses with improving environmental performance and establishing environmental management systems. ISO 14001 certification can be quite time consuming and resource intensive, particularly for small businesses. However, it is a good way to gain recognition for taking action for the environment. Those not seeking certification can still benefit greatly from the information provided within the standards on approaches that can result in significant efficiency gains and cost savings.

Standards Australia

Standards Australia is an independent, not-for-profit organisation whose primary role is to prepare Australian Standards through an open process of consultation and consensus in which all interested parties are invited to participate. Standards Australia is the peak standards writing body in Australia, and is the Australian representative on the International Organization for Standardization.

The Standards Australia website[4] provides further information about standards in Australia. The ISO 14000 series has been adopted in Australia and New Zealand as the AS/NZS ISO 14000 series. Copies of the ISO 14000 series can be purchased from Standards Australia, either from the Standards Australia website, or by phoning the Customer Service Centre (ph. 1300 65 46 46).

Life Cycle Assessment

Life cycle assessment (LCA) is a tool for assessing the environmental impacts of a product, process or activity throughout its life cycle from the extraction of raw materials through to processing, transport, use and disposal. A commonly coined phrase used to describe LCA is an examination of all aspects 'from cradle to grave'. It should be noted that LCA is still in its infancy in Australia, and may not be relevant or appropriate to all businesses.

LCA can help businesses to better understand the environmental impacts of their operations, goods and services, and to identify the most

[4] *http://www.standards.com.au*

effective improvements that can be achieved in environmental performance and use of resources. Businesses can therefore use it in the design of their products and production lines.

LCA can also be used for comparing the environmental impacts of like products and services and thus, for marketing 'green' goods. There is potential for LCA to be utilised in verifying the environmental credentials of particular goods and services in the market place, including international trade.

Undertaking an Assessment

The assessment process involves identifying each stage in a production or service system. This may include extraction and processing of all raw materials that contribute to the product, transportation of raw materials to the manufacturing site, each stage of the manufacturing process, waste production and treatment, packaging, distribution, use by consumers and final disposal including potential recycling or reuse of the product. For each of these stages, the impact is measured in terms of resources used and environmental impacts.

Benefits

Some of the potential benefits of LCA include:

Product Improvement: A LCA can identify the most efficient and cost effective options for reducing the environmental impacts of a product or service. Such improvements can make a product more desirable to consumers. For example, a dishwasher with high energy efficiency will cost less to run. Financial savings can also be achieved for the company, for example, by reducing the amount of overall materials that are used in the manufacture of a product.

Process Improvement: LCA can be used to assess a company's operations and production processes. It is a useful way to quantify resource and energy use. This may in turn suggest options for efficiency improvements such as avoiding waste treatment, using fewer resources and improving quality in manufacturing.

Strategic Planning: LCA can be used for strategic planning. As environmental regulations and expectations increase, there is likely to be increasing pressure for companies to improve their environmental operations. Environmental performance is also likely to become more critical to international competitiveness. Manufacturers will need to be able to account for and plan for the reduction of the environmental impacts of their products and entire business operations.

Challenges for Life Cycle Assessment

LCA is an emerging environmental management tool for Australia and as such, faces many challenges in the future. LCA has a number of drawbacks. It requires specific and well researched information to establish baseline environmental impact data for even basic raw materials, and can thus be extremely resource intensive. Also, the environmental impacts of raw material extraction and production processes may vary from country to country, and even from region to region. For example, the impacts of extracting one tonne of coal in Australia differ from those in the USA, because of different mining and transport techniques and technologies, and also a different environment.

It is important to determine and clearly define the scope of a LCA. Since the process can be resource intensive and time consuming, clear

objectives should be set and the study confined to providing information to meet those objectives. How far a LCA should go in measuring environmental impacts is often a difficult question. For example, in undertaking a LCA of a product, should the environmental impacts of making the manufacturing equipment be determined?

A comprehensive LCA can be complex, expensive and time consuming, and is unlikely to be relevant, or indeed, possible for smaller organisations. However, it is still possible to reap the benefits by adopting a 'life cycle approach'. The LCA process can be streamlined, with a company examining only those parts of its operations that have the most impact or potential for improvement. This can maximise the benefits and minimise the cost of LCA work.

Existing Activities in Australia

Much work is currently being undertaken in Australia to develop overall expertise as well as data and methodologies for LCA. The CRC for Waste Management and Pollution Control at the University of NSW and the Centre for Design at the Royal Melbourne Institute of Technology are collecting data on production input materials. This work is being undertaken in collaboration with a number of key industry players. Companies such as BHP and Boral are undertaking LCA for product and process improvement. The Sydney 2000 Olympics has also encouraged work on LCA, with construction having to meet stringent environmental guidelines for a 'green games'.

Environmental Reporting

Environmental reporting is a process whereby an organisation provides information on its environmental performance and achievements as well as its contribution to sustainability. It generally involves collecting information on the impacts of the organisation on the environment, and its performance in managing those impacts.

Environmental reporting is a practice that is just starting to take off in Australia. A recent study by the Snowy Mountains Engineering Corporation (SMEC)[5] found that the number of corporations making public environmental reports is significantly lower than in North America and Europe. However, the number of organisations making public environmental reports is growing as community expectations increase for organisations to be more accountable for their environmental impacts. It will also grow as organisations discover the benefits that reporting can deliver.

The main benefit of undertaking environmental reporting is that it greatly improves relations with the community and key stakeholders. The process of developing a report often also uncovers opportunities for improvement in environmental performance, along with efficiencies in operations and monetary savings.

Types of Environmental Reporting

The scope of environmental reporting can vary depending on what suits a particular organisation. Some choose to develop internal reports for the benefit of their staff, others choose to publish reports for the general community.

Internal reports are a useful tool for a company to ascertain and identify ways to improve their environmental performance. Such reports allow a company to derive many of the benefits of environmental reporting without making information available to the general public. Internal reporting is also a means for a company to become familiar and comfortable

[5] *The study compares the status and standard of environmental reports by 30 Australian companies using the United Nations Environment Programme (UNEP) criteria. For further information, contact SMEC, ph (03) 9889 0485.*

with environmental reporting, hence a first step towards public reporting.

Public environmental reporting is the voluntary public disclosure of information about an organisation's environmental performance. Some mandatory public reporting requirements have been introduced in Australia in recent times.

The National Pollutant Inventory[6] (NPI) is a database designed to provide the community, industry and government with information on the types and amounts of certain chemicals being emitted to the environment. Companies are required by legislation to provide data on their own emissions. The Federal Government has also recently amended the Corporations Law, including certain requirements for companies to report on their performance in relation to environmental regulations.

Increasingly however, companies are realising the potential market advantage and other benefits in voluntarily providing environment reports that go well beyond any regulatory requirements. This can be seen from the strong response by industry to the Greenhouse Challenge Program, where many companies have volunteered to publicly report achievements in reducing greenhouse gas emissions.

Components of an Environmental Report

To be effective and credible, environmental reports should provide open, honest and comprehensive information on environmental impacts and management procedures. Companies wishing to determine possible components for environmental reporting can see an example of one State's approach in the New South Wales EPA publication *'Corporate Environmental Reporting – Why and How'.*

The sorts of issues that are often addressed in environmental reports include:

- policies, systems and programs for environmental management and remediation;
- waste emissions, transport emissions, greenhouse gas emissions;
- water, energy and other resource consumption;
- pollution prevention activities;
- environment related research;
- legal compliance; and
- community consultation.

In developing a report it is important for companies to set their own objectives, including who the report is aimed at and what achievements are expected. This could be, for example, to demonstrate responsible environmental behaviour to the relevant environment protection agency and local community. Companies should also consider whether stakeholders should be involved, for example, customer feedback could be sought, or the report be independently reviewed and verified.

Benefits

There are a range of benefits to be gained from environmental reporting. Briefly, they include:

Better relations with the community: Increasingly, the community is demanding information on the environmental impacts of companies.

Greater control of environmental disclosure: Reporting allows companies to present information on their environmental performance in their own way.

Facilitating efficiency improvements: An environment report that details resource use, waste discharges and other environmental

[6] *http://www.environment.gov.au/epg/npi/home.html*

impacts can highlight inefficiencies in production processes.

Better relations with regulators: There is an increasing trend in Australia for regulators to adopt more flexible regulatory regimes with companies that demonstrate responsibility for environmental management and transparency over their environmental performance.

Better relations with financiers and insurers: Reporting can illustrate a company's commitment to improved management of environmental risks. This may lead to a more favourable evaluation by investors, lenders and insurers. It may also open access to ethical investment funds.

Better relations with staff: Reporting can raise the awareness of staff, giving them confidence both in their own health and safety, and that they are not impacting on their local community. This can contribute to increased morale and productivity.

Creating market opportunities: Reporting provides the opportunity to market clean and green products and services and improve competitiveness by establishing environmental integrity.

Miners' Commitment to Public Reporting

In recent years the minerals industry has shown a lot of interest in and produced a number of public environmental reports. One of the motivators has been the Australian Minerals Industry Code for Environmental Management, launched in December 1996. The Code is voluntary, with those minerals companies signing up to it committing themselves to high environmental standards. One of the key obligations of signatories to the code is to prepare publicly available annual environment reports that demonstrate performance against Code principles and indicators.

Environmental reporting has been incorporated into the Code because the minerals industry sees that open, credible reporting of environmental performance is an essential step to build greater trust with governments and the community. It can also play a significant role in driving improvements in environmental management, and thus the management of resources for a company. To date, around 15 major minerals companies have provided public reports with many others having pledged to release a report in the near future.

Western Mining Corporation (WMC) is one company with a strong commitment to environmental reporting. It has published three reports. As it gained experience with reporting, WMC saw advantages in broadening their consultation. Its reporting process now involves consultation with employees, and external review and verification by an independent auditor. WMC has also established an advisory group of experts in different fields relating to the report. This group provides critical feedback and advice on future directions for WMC's reporting. The environmental reports have helped to stimulate the development of environmental management systems at WMC's mining sites because of the data the company considered it necessary to collect.

Risk and Exposure

Environment reporting experiences to date have not put companies at extra risk of prosecution. While companies often report emissions, spillage and other environmental incidents, a report provides the opportunity for a company to outline how it dealt with the problem and how it will address such issues in the future, and puts the incident in the context of their overall environmental performance. Rather, by determining environmental impacts and plans of action for dealing with these, the risk of prosecution decreases.

Other Activities

To promote environmental reporting and assist companies with presenting public reports, Environment Australia is developing national guidelines. These will be voluntary, placing no obligation on companies to provide reports, nor prescribing exactly what reports should contain. The guidelines will provide advice on how to develop a report and how to present information to a company's main stakeholders. The guidelines will be a useful tool for companies to determine what information they should report on, who they should consult with, and whether their report should be independently verified. The guidelines will also provide information about the standard of environmental reports within Australia and overseas.

Environmental Accounting

Traditional accounting practices have often overlooked the environmental costs of operating a business, even though those costs can be significant, including: costs of resources, both those directly related to production and those involved in general business operations; waste treatment and disposal costs; the cost of poor environmental reputation; and the cost of paying environmental risk insurance premiums.

In some cases, environmental costs such as those for natural resources (energy, air and water) are subsumed into a one line 'operating cost' or 'administrative' cost that is treated as being independent to the production process. Yet if these costs were more closely identified and monitored, a business might be able to identify areas for increasing efficiency and savings.

Also, environmental costs are often only defined narrowly, as costs incurred in compliance with, or breach of, environmental laws or regulations. This is because accounting systems tend to focus on clearly identifiable costs to the business, not on the costs and benefits of alternative options.

Environmental accounting is about specifically defining and incorporating all environmental costs into a company's financial reports. If such costs are clearly identified, a company is more likely to take advantage of the opportunities to reduce environmental impacts. The benefits of adopting environmental accounting can include:

- better estimates of the true cost to the firm of producing a product or service. This may improve pricing and hence profitability;
- identifying the true costs of a product, process, system or facility and thus revealing those costs to the responsible managers;
- assisting managers to target areas of operation for cost reduction and improvements in environmental and quality measures.
- assisting with the assessment of the cost effectiveness of environmental or quality improvement measures;
- motivating staff to search for creative ways to reduce environmental costs;

- encouraging changes in processes to reduce resource use and reduce, recycle or identify markets for waste;
- increasing staff awareness of environmental and occupational health and safety issues; and
- increasing customer acceptance of the firm's product or service and hence competitiveness.

Environmental accounting is in its infancy in Australia. To progress, an accepted accounting methodology needs to be established. This would provide a means for accountants to include environmental issues within existing accounting practices, and inform industry of how this new approach can be used to identify areas for reducing environmental impacts and saving money. *The Australian Society of Certified Practising Accountants (ASCPA)* has established a discussion group to identify issues related to changing accounting standards in Australia to take into account environmental costs.

Design for Environment

Design for Environment is about reducing the environmental impacts of a company's manufactured products by introducing improvements at the design stage. It can have strong links with Life Cycle Assessment.

The environmental performance of products is an issue that is increasing in importance particularly as the international market for 'green' goods continues to grow. This growth has been driven both by consumer demand and environmental regulations in Europe, North America and Japan. Many leading companies have devoted considerable attention to improving the environmental performance of their products through better design. These include international manufacturers of motor vehicles, computers, electronic goods and whitegoods.

Design for Environment begins by examining all aspects of the production of a particular commodity, including sourcing of raw materials, manufacture, distribution, use, and disposal. At each of these stages, the environmental and human health impacts are assessed. The next stage is to consider options for reducing the identified environmental impacts by improving the product's design. Examples of options that can be employed include:

- using materials that are less harmful to the environment, eg. less energy intensive, recycled, non-toxic or non Ozone-depleting, waste by-products from other manufacturing processes;
- using renewable resources, eg. materials from plant or animal sources harvested on a sustainable basis, and renewable energy sources for production;
- using less input materials including energy and water;
- minimising the impacts of distribution through reducing the weight of the product;
- minimising the resources, such as water and energy, that the product will use over its lifetime;
- maximising durability and longevity of the product; and
- improving disposal options for the final product, eg. design for the product or its components to be recycled, ensuring that any unrecyclable parts can be safely disposed of.

Benefits

The end result of this process is often a product that not only has less impact on the environment but is also better in terms of quality and marketability.

The Design for Environment process provides the data and credentials to market goods as being environmentally preferable. 'Green' goods

can appeal to consumers in their own right, but also because they may be more durable, higher quality, and cheaper to run.

Costs for the manufacturer can also be reduced. Decreasing the amount of materials and resources needed to manufacture the product can also reduce the waste and pollution created, and thus, the associated costs of waste disposal. Other options for savings include reducing packaging, and reducing transport costs by reducing the weight of the product or increasing the efficiency with which it is packed or stored.

Some countries are beginning to require under legislation that manufacturers take back products at the end of their life. This is known

case study

An Efficient Dishwasher

A dishwasher of exceptionally high energy and water efficiency, the *Dishlex Global 500*, was developed by *Southcorp Whitegoods* with the assistance of the *National Centre for Design* at *RMIT* and *Environment Australia*.

A life cycle assessment was undertaken of *Southcorp's* existing dishwashers. This clearly highlighted the best areas for design improvement: energy efficiency and water consumption. Recycling was also identified as a priority to minimise waste. Global trends in waste minimisation policy and market intelligence suggested that attention to design for recycling should be pursued.

An all day workshop was held at *Southcorp* to generate ideas for improving dishwasher performance, consider design problems, and identify areas for further research. The workshop involved management, technical and marketing staff as well as stakeholders with a special interest, such as component suppliers and detergent manufacturers. The final result was a state-of-the art dishwasher with the highest standards of energy and water efficiency in Australia. Key features of the *Dishlex Global* Dishwashers are:

- **highest Australian six-star energy rating (energy consumption of 256 kWh);**
- **AAA water rating, using less than a sink and a half of water for each wash (less than 18 litres per full load);**
- **cost of each 'fast wash' is less than 10 cents;**
- **Waste avoidance through greater material efficiencies (seven and a half kilograms lighter than previous models);**
- **coded plastic components to facilitate disassembly, and fewer material types, making end of life recycling more cost effective;**
- **provision for enzyme-based detergents, allowing low temperature cycles saving further energy; and**
- **four-stage, stainless steel micro-filtration system for more efficient water use.**

The dishwasher has been a best seller, taking 50% of its market range in Australia. It has displaced imports and is exporting to other countries including the United States. It won the appliance industry award for best white good for 1997. If every dishwasher in current use in Australia was replaced by the *Dishlex Global 500*, approximately 10.5 billion litres of water and 700 tonnes of carbon dioxide could be saved per annum.

as extended producer responsibility. Design for Environment can address this issue, for example, by increasing the length of the life of the product, reducing the disposal costs, making it easier to repair, and increasing the recycleability of the entire product or some of its components.

Managing the Supply Chain

A supply chain is a group of organisations that contribute to the provision of a final product or service. It can range from the supply of raw materials and components used in a manufacturing process, through to wholesale and retail distribution and service.

Supply chain management involves improving the processes and relationships that exist to support the provision of goods and services along a supply chain.

Larger companies are usually dependent on outside suppliers and as such are developing new approaches to managing the performance of their supply chains. Supply chain management can bring a range of benefits, including better communication, more efficient delivery and distribution of goods, quicker market response and more efficient process operations. It can also reduce costs and assist the development of a shared understanding of the marketplace among suppliers and their customers.

Environmental benefits can also be derived by better supply chain management. For example, greater efficiency in distribution may result in lower environmental impacts from transport. Experience also shows that supply chains can be effective mechanisms to promote better environmental management practices. They offer opportunities for joint cooperation to improve productivity and reduce environmental impacts. For example, companies can encourage their suppliers to reduce costs and improve quality of their inputs to the supply chain. This in turn encourages suppliers to reduce waste and resource use.

To be able to guarantee that a company is managing its business in the most environmentally appropriate way it should consider all aspects of its operations, including those of its suppliers.

Other benefits of supply chain management include:

- *Security of supply:* Sound management of the supply chain reduces the risk of a supplier failing to provide vital goods or services, for example, from not meeting regulations or quality standards. Failure of supply can interrupt business operations and compromise competitiveness.
- *Market opportunities:* There is an increasing market for environmentally preferable goods. Often a key factor in the environmental integrity of a good is the source of raw materials or components provided from its supply chain.
- *Maintaining a competitive edge:* Companies need to keep ahead of environmental trends in terms of regulatory requirements and consumer expectations. This requires managing their suppliers' as well as their own businesses.

Performance Based Contracting

Performance based contracting (PBC) is a technique that has been mainly utilised in the energy industry, but has potential for being applied to many parts of business activity. Under PBC, a third party contractor takes

responsibility for the management of a specific part of the business. The contractor adopts the risk for managing that part of the business but also gains financial rewards for making it more efficient. The efficiency gains are shared between the contractor and the owner of the business.

For example, in the energy industry, one way that PBC can work is that Performance Based Contractors approach firms with proposals to improve their energy efficiency over a period of time, at no cost to the firms. The savings made by the energy efficiency improvements are used to pay the contractor and also are returned to the firm. Such an approach can be used for many aspects of a firm's inputs and outputs, including water, transport, waste, or chemicals.

PBC can be a particularly useful tool for firms that do not have ready access to capital, or the necessary expertise to implement cleaner production. In such cases, the contractor will organise the capital required for the changes to be made, with the cost of the capital being paid for by the efficiency improvements achieved by the firm.

Case Study

Holden's Engine Company and PBC

Holden's Engine Company (HEC) **recognised that their core business and expertise was making engines, not managing chemicals. Through a tendering process *HEC* appointed *Castrol Plus* as its chemical manager. *Castrol* is now paid a set amount to supply chemicals and management resources. *Castrol* has the expertise and now has a vested interest in minimising chemical usage.**

"What chemical management does is it puts the onus back on us, on **Castrol,** ***to reduce the usage of chemicals and the more we do that the more profitable it becomes."***

ROSS McFARLANE
Chemical Manager for **HEC, Castrol Plus.**

The *HEC* chemical management programme was able to reduce coolant and biocide usage by 46 800 litres each year representing an annual savings of $124 000. This also resulted in a reduction in trade waste disposal of over 163 800 litres, saving the company a further $19 650 pa.

Next year *HEC* and *Castrol* expect to add another $155 350 to these annual savings by expanding the cleaner production chemical initiatives throughout the factory.[6]

"Suddenly our goals, **Holden's** ***goals and the environmental goals all come together."***

ROSS McFARLANE

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[6] *Holden's Engine Company Case Study, National Cleaner Production Demonstration Project, Environment Australia, 1997, also available on EnviroNET Australia.*

Further Information

Environmental Management

Manager, Sustainable Industry
and Communities Section
Environment Australia
GPO Box 787
Canberra ACT 2600
AUSTRALIA

Email: cproduction@ea.gov.au

The Eco-efficiency and Cleaner Production Home Page

(http://www.environment.gov.au/eecp.html)

The Eco-efficiency and Cleaner Production Home Page has more than 100 case studies detailing the experience of Australian businesses in environmental improvement, covering a wide range of industry sectors. The site also provides information on industry codes of practice, and the tools for environment management listed in this booklet.

EnviroNET Australia

(http://www.environment.gov.au/net/environet.html)

EnviroNET Australia is a network of databases which provides information on Australian organisations with environmental expertise, goods and services. It also provides information on environmental technologies, education courses, and research and development in Australia.

Industry Assistance

The AusIndustry Hotline

(http://www.ausindustry.gov.au)

AusIndustry is the Commonwealth Government's central point for business information and assistance. Ph: 132 846

The Business Entry Point

(http://www.business.gov.au/)

The Business Entry Point (BEP) is an initiative of the Federal Government, and is maintained through the efforts of the Department of Industry, Science and Resources, the Department of Workplace Relations and Small Business, and the Treasury. The BEP is designed to make it easier for business to access comprehensive and targeted information about relevant government programs and policies.

Industry Associations

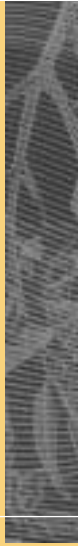
Australian Chamber of Commerce and Industry
Phone (02) 6273 2311

Australian Industry Group Phone (02) 9466 5566

Business Council of Australia Phone (03) 9610 4222

Other Sources

Further information on local environment initiatives can be obtained by contacting your State/Territory environment protection agency.



Environment Australia

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