Sustainable Manufacturing
Unpacking The Issues

Manufacturing Skills Australia Report
September 2009
Environmental sustainability requires the design and provision of products and services that incorporate and promote waste minimisation and the efficient and effective use and reuse of resources.
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In 2008 in its report Sustainable Manufacturing, Manufacturing for sustainability, Manufacturing Skills Australia (MSA) reported the Australian Industry Group (Ai Group) findings that one in four companies identifies climate change as presenting a high market risk to their business, and one in two sees it as a medium to high opportunity. Twelve months on, those early adapters have their stories to tell. This report provides an update on how the environmental agenda is affecting manufacturing today and what strategies are being engaged to address these issues.

The timely release of research conducted by the Ai Group and KPMG provides pertinent and current information on the readiness of manufacturing enterprises to embrace the impacts of the Carbon Pollution Reduction Scheme (CPRS). This survey shows that, while manufacturing enterprises are more prepared than many other industry sectors, there is still much work to be done to ensure that they have accurate information, assess the potential impacts on their operations thoroughly, determine an appropriate course of action and build their workforce capacity accordingly.

This is certainly a time in which effective leadership will be critical. The Australian Government is clearly committed to a low carbon economy and has implemented significant funds and resources to support enterprises to make the transition. It is important that initiatives are well coordinated and accessible; enterprises are already feeling overwhelmed by the plethora of ‘solutions’ and possibilities. Corporate leadership may also need to be assessed for its ability to engage people at all levels of the organisation to address environmental performance. The role of industry bodies such as Ai Group and MSA is, and will continue to be, instrumental in helping enterprises navigate the new terrain in an effective and cost efficient manner.

Manufacturing enterprises are concerned about the costs associated with sustainability. The CPRS will further burden enterprises financially with direct costs of compliance and indirectly through rising costs of energy, transportation, water and waste disposal. The Ai Group/KPMG survey found that 44% of manufacturers have already experienced an increase in compliance costs over the past three years. Managing the cost implications of the sustainability agenda is a major challenge for government, industry bodies and enterprises. Ai Group has been extensively involved in negotiations with the Government to find a balanced approach to managing the impacts on businesses.

Industries around the world are now vying for position in the new global market and Australian companies will need to be innovative, adaptive and proactive to compete, or take the opportunities to lead. This is a time for new thinking, initiative and collaborative effort, not a time to be hamstrung by poor information, lack of resources or financial barriers.

Workforce planning will need careful steering and support, and already industry bodies such as MSA, Ai Group and unions are responding. For example, the Australian Manufacturing Workers’ Union (AMWU) is providing a focus on jobs and workers most affected in the transition to the new economy.

On the positive side, enterprises that have taken a proactive approach to reducing their carbon footprint are experiencing surprising gains. There is extensive evidence of strong financial returns, with convincing payback periods, on environmental initiatives and companies are making good use of the supportive expertise and funding available.
Sharing these success stories is essential to inspire and disseminate knowledge during this steep learning curve that we are all on.

The key to moving forward for enterprises is in examining the business case for sustainability initiatives. Well thought-out programs can positively impact the environmental, social and economic aspects of the bottom line and can help to provide the incentive for companies to make sustainability commitments. Identifying and targeting the highest risk areas and the most effective strategies helps to determine priority areas for companies.

Another fundamental criterion for success in improving our carbon footprint is ensuring enterprises have the right skills when they are needed. The impacts of carbon reduction initiatives will be incremental and affect industry sectors differently. While there are many skills that are already available to be used in similar or even new applications, there will be a strong demand for new skill development or up-skilling of current skills. This new era will demand capacity in a range of areas including design and innovation for sustainability, development of energy and resource efficient products and processes, reuse and recycling of materials, life cycle analysis, developing compliance strategies and environmental impact statements, environmental auditing measuring, monitoring and reporting on carbon emissions. Further skills associated with specific technologies and practices will continually emerge as industries make the transition.

MSA is committed to providing leadership in helping manufacturing industries access and develop the skills they need to compete in a sustainable future. It already has a suite of targeted sustainability units available for incorporation into all its qualification outcomes and is expanding on these as new skill needs emerge. New qualifications that target some of the job roles identified earlier are currently under development. Flexible training pathways are being developed to allow the transference and updating of skills that will be necessary. The Competitive Manufacturing qualifications, MSA’s flagship products, provide a key strategic response to environmental challenges, and are currently being expanded and broadened to incorporate an environmental focus. The waste and efficiency focus of these units of competency and qualifications are becoming increasingly relevant for a wide range of industries beyond manufacturing.

The synergies between lean manufacturing and environmental sustainability are becoming widely recognised and many enterprises are using lean tools and processes very effectively to target environmental waste and efficiency improvements. MSA considers that skill development in lean manufacturing practices is a key strategy for enterprises to improve their environmental performance.

While we are still at the beginning of a whole new world, there is definite progress being made. It is important now that we forge a path that maintains relevance for industry and adds value to environmental, social and financial outcomes. If leadership initiatives can keep it real for business, we can anticipate that both planned and unexpected gains may result, and that enterprises can focus on developing the technologies and processes that an environmentally sustainable society will need.

MSA looks forward to working with manufacturing, automotive and other enterprises to create this new possibility.
Where is it all heading?

What’s it all about?
The need to find ways to reduce humanity’s carbon footprint is today an accepted challenge that is permeating society and industry at all levels. While the sceptics still exist, the overwhelming focus is now not on ‘why’, but on what to do, who should do it and how we should go about it. On this, there is much debate and a great deal of opinion; it is hardly surprising that industry is confused.

With ‘green’ strategies and environmental solutions now emerging from all quarters, the challenge for enterprises is to determine what is relevant and appropriate, and what will result in improved environmental outcomes whilst maintaining or improving the viability of the organisation.

What are we actually trying to achieve?
It’s often helpful to start with the end in mind; from here we may more easily determine a path that relates back to our specific circumstances. It is therefore understandable that many are initially juggling with a definition of what sustainability means in order to direct their activity.

The most-well known and accepted definition of sustainability was developed by Ross Garnaut in his report Our Common Future. He defines sustainability as:

‘Development that meets the needs of the present without compromising the ability of future generations to meet their own needs’ (World Commission on Environment and Development 1987).

This provides an all encompassing definition that incorporates environmental, social, economic and potentially more aspects for consideration. It implies that sustainability is the achievement of a balance between these values that can be maintained over the long term, even indefinitely. This is important, as achieving sustainability across the triple bottom line is ultimately the only viable solution for enterprises. Environmental solutions must be ones that support ongoing profitability and social responsibility if they are to offer real solutions in creating a low carbon, sustainable economy.

The Industry Skills Councils (ISCs), including Manufacturing Skills Australia, have developed a definition to focus their activity on the workforce development implications of sustainability. They interpret ‘environmental sustainability’ as opposed to simply ‘sustainability’ in order to target the environmental aspects of sustainability.

Environmental sustainability requires the design and provision of products and services that incorporate and promote waste minimisation and the efficient and effective use and reuse of resources.

This definition starts to hone in on what the practical applications and implications of environmental sustainability mean for enterprises. Within this are a plethora of strategies ranging from emissions trading, to water recycling and reuse, including building design and insulation, energy efficient practices, new materials, processes and products, and reduction and elimination of waste, amongst others.

Reducing carbon emissions – an international objective

Greenhouse gas emissions, particularly CO₂, are identified as the primary catalyst for global warming and the major target for governments around the world. Reducing the ‘greenhouse...
effect’ is the primary goal of climate change action. The Kyoto Protocol, adopted in Kyoto, Japan, on 11 December 1997 and entered into force on 16 February 2005, is a legally binding international agreement by which nations voluntarily commit to reducing greenhouse gas emissions.

The objective of the Kyoto Protocol is the “stabilization and reconstruction of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system.”

Today there are 184 parties that have ratified the agreement, which accounts for 63.7% of emissions from industrialised countries. These parties agreed to reduce greenhouse gas emissions by an average of 5.2% (from 1990) by 2012.

Australian Prime Minister Kevin Rudd ratified the Kyoto protocol on 3 December 2007.

The Kyoto Protocol targets the emissions of the 6 primary greenhouse gas types including:

- Carbon dioxide (CO₂)
- Methane (CH₄)
- Nitrous oxide (N₂O)
- Hydrofluorocarbons (HFCs)
- Perfluorocarbons (PFCs), and
- Sulphur hexafluoride (SF₆)

Enterprises that emit any of these gases must understand how much of each they produce and release into the atmosphere and be able to effectively measure and report on volumes.

Recording the state of things with NGERS

In Australia, a National Greenhouse and Energy Reporting Act was affected in September 2007 to support a national, streamlined approach to reporting greenhouse gas emissions. The National Greenhouse and Energy Reporting System (NGERS) provides a framework for reporting on energy consumption and production, greenhouse gas emissions, intensity indicators, energy audits, action plans, energy savings, greenhouse gas reductions, and projections. It is the NGERS which will be the mechanism by which carbon emissions data will be reported once Australia’s Emissions Trading Scheme (ETS) is legislated.

Mandatory reporting will focus on the volume of greenhouse gas (GHG) emissions produced from the direct manufacturing process, including transportation to and from the manufacturing site. This is referred to as Scope 1 in the illustration above. Enterprises will also be required to report on greenhouse gas emissions that are created as a result of activity that produces electricity, heating, cooling or steam (Scope 2) within the boundaries of the manufacturing facility. Those emissions produced outside of the manufacturing facility, for example once a product is being used by a consumer (Scope 3), are not required to be reported on.

Who does the NGERS apply to?

There are established criteria for identifying who should report under the NGERS. These relate to organisational structure, types of emissions and emissions thresholds. While manufacturing is one of the key industries that meets the criteria, there are still only a small percentage of enterprises that are required to report via the NGERS. For more information about who NGERS applies to, refer the Department of Climate Change website: http://www.climatechange.gov.au/reporting/apply.html or contact your Ai Group representative.

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Section one
Scoping the big picture

The Carbon Pollution Reduction Scheme – the cornerstone strategy

Australia’s impending Carbon Pollution Reduction Scheme (CPRS) is the Government’s primary strategy for Australia to reduce its carbon footprint and meet its international commitment to the reduction of greenhouse gas emissions. It is designed to provide guidelines on national emission targets, allocations (of carbon credits), emission offsets and regulation of compliance and trading of credits. While the details are still being debated in parliament, there is widespread anticipation about who will be affected and what the regulatory requirements will be. At this time there is also concern about the financial implications of compliance, the points of measurement for carbon emissions and the impact of increased costs on Australia’s global competitiveness. These are exacerbated by the timing of the Scheme’s application, following the difficulties enterprises have endured during the Global Financial Crisis.

The Ai Group for example has been instrumental in the negotiations to represent the concerns and needs of industry as the Government seeks to finalise its CPRS conditions. Ai Group is playing a critical role in ensuring regulation is meaningful and constructive for industry. It is working with Government and industry bodies to ensure a coordinated and coherent approach to policy is achieved with minimal disruption to business.

In the United States the American Clean Energy and Security ACT (ACES), which is equivalent to Australia’s CPRS is currently being finalised for review and signoff while the European Union’s (EU) Emissions Trading Scheme (ETS), currently the largest scheme in the world which covers close to half of the EU’s emissions of CO₂ and 40% of its total greenhouse gas emissions, has been running since 2005. The EU is currently reviewing its scheme and looking to expand the inclusion of pollutants. It’s not a case of ‘if’ but ‘when’ for Australian enterprises now as we move to prepare for carbon reduction and carbon trading.

The Emissions Trading Scheme (ETS) is the central policy of the CPRS which will in effect put a price on carbon emission by establishing a ‘cap’ or limit on the amount of carbon that can be emitted by industry, selling carbon permits to this limit and allowing trading of permits and penalising those which exceed their permit allowance. The Commonwealth Government has committed to introduce the Scheme by 2010. The cost implications of ETS will encourage affected industries to establish cleaner, more efficient and environmentally friendly options. The NGERS will provide the framework for reporting on emissions.

While the details of the CPRS and ETS are still to be confirmed, it is expected that only big emitters (greater than 25,000 tonnes per year) will be directly involved in the ETS. This equates to less than 1000 companies across Australia that will be required to buy greenhouse permits. In manufacturing, enterprises are likely to be large and medium sized operations, especially those which process metallic and non metallic minerals, chemicals and plastics. However, many others will be affected by increased costs that are passed down by those purchasing greenhouse permits.

All enterprises can expect some kind of impact from increased prices of electricity, gas and fuel. The competition for permits and their relative costs will increase in line with Australia’s emission targets. This will provide increasing incentive for industry to find cleaner, cheaper sources of energy.

Accommodations – EITE, compensations and supports

The CPRS includes some measures to support those industries most affected by an ETS such as Emissions Intensive, Trade Exposed (EITE) industries which include sectors such as iron and
steel, alumina, aluminium, chemicals, cement, non-ferrous metals, metals processing and liquefied natural gas processing. These industries will be granted a number of free permits to offset their costs.

The Government’s Climate Change Action Fund (CCAF) will focus predominately on those industries not receiving free permit allocation, but which nevertheless need assistance to adjust to the carbon price. The Climate Change Action Fund will provide targeted assistance to businesses, community sector organisations, workers, regions and communities to smooth the transition to a carbon constrained economy.

This Fund will particularly be available to small to medium sized enterprises and community sector organisations which will be impacted by the Scheme and target support in four key areas:

1. Addressing information gaps for business and community organisations
2. Investment in energy efficiency and low emissions technologies
3. Structural Adjustment Provision for workers and communities
4. Coal sector adjustment to address this sectors adverse impact due to the relatively high permit liabilities and in many cases limited opportunities to pass on costs.

In order to support these activities the Government will commit $2.15 billion to the CCAF over a five year period running from 2008–09 to 2012–13. The Government has committed an additional $300 million for structural adjustment assistance for coal mines with high fugitive emissions over the period 2013–14 and 2014–15. The CCAF will complement existing climate change measures such as the Clean Business Australia initiative and the low emissions technology funds including the National Low Emissions Coal Fund.

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**Case Study - Cryovac’s water usage cut by more than 20%**

The Cryovac Food Packaging Division has cut water usage from nearly 60 ML in 2006/07 to 43 ML in 2008/09 through the installation of a reverse osmosis (RO) plant and better water management.

Water quality is important for this food grade product and, while water was filtered, it then went to trade waste after total dissolved solids had built up.

The company used a $27,400 Australian Industry Group grant to assess the feasibility of reusing the waste water from this process in the cooling towers which consume about 63 per cent of the site’s water. It also wanted to examine the feasibility and cost of two other possible sources of water for the cooling towers: treating barrier process trade waste and installing a rainwater harvesting system.

The study found the three proposals would require a capital outlay of nearly $270,000 with payback periods of 8.6 years for a system to deliver water from the RO to cooling towers, just over nine years for a treatment system for barrier process trade waste and 40 years for rainwater harvesting.

Despite the capital costs and lengthy payback periods, the company decided to proceed with the delivery system from the RO plant to the cooling towers. They are also planning to proceed with the treatment system for the barrier process trade waste in 2010. The study estimated that rainwater harvesting would save up to up to 1.65 ML in a typical rainfall year. While this is a small contribution to Cryovac’s total water needs, the company plans to initially install a rainwater recovery system with tanks at one main building. This will complement water savings already achieved through improved water management.
Section one
Scoping the big picture

Case Study - MIDLAND BRICK

Midland Brick, the largest clay brick manufacturer in the world is based near Midland in Western Australia. Midland Brick, part of the Boral Group, has grown from producing bricks and pavers to be a part of the largest building products manufacturer in Australia. A large component of their manufacturing operations is based on brick production through their large gas fired kilns.

The energy required to run the kilns for Midland Bricks is up to 40% of their total operating cost base.

In 2005/06 Midland Brick undertook a trial assessment of their kiln operations as part of the Federal Government’s Energy Efficiency Operations Program to identify energy efficient opportunities. The review looked at improvements through their existing production processes. In 2008 they again conducted further investigation into the production processes and along with the lesson learnt from the earlier studies, were better able to measure and report on energy savings as a result of the implementation of gas metering systems. In addition to developing accurate measurement techniques, improved data collection processes enabled Midland Bricks to identify 5 new projects that focus on energy efficiencies and savings.

By comparing different kilns, Midland were able to pin-point with accuracy where energy waste existed, such that one kiln was using around 13.5% more gas than another as a result of various kiln modifications over the years. With recalibration according to original design specifications and servicing of gas regulators and valves, the energy savings are expected to be around 23,530 GJ/annum.

In total 3 projects have been completed and 5 more to be implemented by the end of 2009 with total expected savings to be approximately 109,371 GJ and 5,400t of CO₂ emissions /annum or 6.5% of the total energy used at the site.

Key decisions that contributed to the positive outcomes and better positioning for future energy efficiency assessments included:

• Assigning an Energy Efficiency Coordinator to be responsible and accountable for project outcome
• Establishing an Energy Efficiency Advisory Group (Strategic) and an Energy Efficiency Assessment Team (Implementation)
• Developing a detailed project management plan, including extensive use of the EEO Assessment handbook, KPIs and targets and linking these to Midland Brick’s performance management system.

Additionally, non-energy related benefits include improved brick quality and operator safety as well as extended life of kiln cars due to reduced thermal shock.

For Midland Brick the result of this program of work meant they not only complied with Government’s request to reduce gas emissions and improve energy efficiency, but also immediately and directly reduced operating costs, resulting in improved bottom line profits.

This Case Study was sourced from the Department of Resources, Energy and Tourism.
There are already a significant range of skills available to support environmentally sustainable outcomes. Many skills, jobs and processes will stay the same.

Key Issues
for manufacturing

Manufacturing will be impacted by carbon reduction initiatives on a number of fronts. As an industry, it is the 3rd biggest emitter of greenhouse gases and as such, many of its sectors will come under the regulation spotlight sooner, rather than later.

Emissions Trading

Enterprises that fit criteria for the Emissions Trading Scheme (ETS) will be directly impacted through a requirement to develop and integrate emissions measurement, recording and reporting mechanisms into their operations. All enterprises will be called upon directly or indirectly to reduce their carbon emissions as the social and financial imperatives increase. Costs associated with traditional supply of energy, water, transportation and other critical manufacturing inputs will drive enterprises to seek more cost effective, environmentally sustainable work practices. While it is still unclear for many enterprises what the full effect of initiatives such as the CPRS will have on them directly, it is predictable that flow-on energy costs alone will provide incentive for companies to evaluate how they can improve their environmental performance in energy efficiency. Those that are already embracing this process will be better placed to make the transition than those which wait.

Preparation

A survey recently conducted by the Ai Group and KPMG illustrates that most businesses understand that we are in a time of significant transition. Manufacturing enterprises made up slightly more than half of survey respondents with most being small to medium sized operations.

A majority of businesses surveyed (three-quarters) have already begun to measure, or plan over the next three years to measure, their carbon footprints. The findings showed that manufacturing enterprises were more likely than construction or service industries to have started or planned this analysis at both an overall level and at a more detailed application. Around 38% of all businesses surveyed have already taken steps to reduce their direct emissions, reduce their energy overheads, or to reduce their energy inputs per unit of production. There were significant numbers of survey respondents that were planning to change operational practices and invest in ‘cleaner’ capital equipment.

Manufacturers were found to be the most active in undertaking a formal assessment of the impacts and costs of CPRS, including identifying opportunities that may be available. However, there was a significant proportion of companies which had not yet conducted a risk assessment and an even higher proportion which did not understand how the CPRS would work. 18% of manufacturers thought they understood all the key elements, while 55% believed they understood some. Larger companies fared better on all counts than smaller operations, signifying the greater challenge for SMEs to access the necessary information, skills or resources. Across the board, the survey found that there was significant lack of understanding, little active engagement in increasing awareness and notable misunderstanding about the implications of CPRS. This highlights an information issue for all industries and one that the manufacturing industry will need to address in order to adequately prepare for the changes ahead.

Compliance

Another issue of concern to manufacturing is the extent and costs of compliance. In research conducted for MSA’s Environmental Scan 2009, compliance cost was one of the most significant concerns and potential barriers the industry identified in adjusting to a low carbon economy. Industry saw these costs not only in securing the skills it would need but also in integrating carbon measuring, monitoring and reporting mechanisms, flow-on costs of compliance through the supply chain and potentially, in loss of competitive edge in the global market. Many questioned where government compliance and taxation costs would extend to – would factors such as transportation, raw materials and manufacturing practices associated with overseas production be taken into account? Or will compliance costs price Australian manufacturing out of the market? Getting the right balance for Australian manufacturers is critical to a successful transition and the Ai Group has been actively participating in negotiations with the Government to determine this balance.

Manufacturers are already getting nervous by what they experience as an increasing level of regulation of energy and greenhouse gas emissions by both state and federal Governments. The Ai Group/KPMG survey found that 44% of manufacturers have experienced an increase in compliance costs over the past three years. CEO Heather Ridout refers to a recent report by the Productivity Commission in which it counted no less than 244 regulatory measures related to greenhouse gas emissions administered by 56 different agencies. Enterprises could be forgiven for not effectively accessing the information they need!

The right skills

Accessing the right skills to navigate the new climate is another critical issue for manufacturing. There are already a significant range of skills available to support environmentally sustainable outcomes. Many skills, jobs and processes will stay the same. For those new skill needs, MSA is committed to developing clear workforce development pathways to ensure enterprises have the right skills at the right time.

On the whole, developing new skills, using resources efficiently and meeting compliance and regulation requirements are not new issues for manufacturing. Manufacturing is already a highly regulated industry, and has long been scrutinised for its environmental impacts. Global competition, skill shortages and now the financial crisis have all demanded that manufacturing enterprises become efficient and innovative operators, or cease to exist. The challenge now is for all manufacturers to identify how to make operations environmentally sustainable, align with changing social values and harness the commercial opportunities presented in this new low carbon economy.
Case Study - ‘Cleaner production’ study results in nation-wide changes for ABnote.

A ‘cleaner production’ study carried out for secure transaction products company ABnote identified potential energy and water savings of nearly $22,000 annually at its Victorian plant, while ‘green building’ efficiencies in a new development could deliver up to $14,200 in additional annual energy savings.

ABnote prints cheques, credit cards, loyalty and gift cards, smart cards, drivers’ licenses, high resolution barcodes and financial cards.

The findings of the study which was funded by a $30,000 grant from the Australian Industry Group will have far reaching impacts, as production improvements in the Victorian plant will be rolled out in plants in New South Wales, Queensland, Perth, South Australia and in New Zealand.

The study identified nine cleaner and more efficient production options, and all but one are being implemented, according to Environment, Health and Safety Manager, Colleen Gilmour.

“We have changed from using hot glue, which has high toxicity, to a cold glue technology which is cleaner, safer and uses less energy.”

A number of recommendations concerned energy use, which resulted in Leigh Mardon appointing ‘green teams’ to conduct audits and ensure plant and office equipment is turned off when not in use.

Water savings are also being achieved through ensuring that evaporative air conditioning units are working properly. Water-efficient fixtures will be installed in the new plant, toilets upgraded to dual flush models and rainwater tanks installed for non-drinking water use.

Many companies are already reporting that the actual gains of their environmental initiatives are exceeding payback expectations.
The good news
- environmental gains are improving all bottom line outcomes - environmental, social and economic

To date there has been extensive debate about the potential financial impact of environmentally sustainable initiatives such as the CPRS, especially during the current period of global financial downturn. Without the details of emissions trading available to determine its real effects, it is difficult to identify what will be the reality and what strategies may be applied to mitigate losses if there are any. However, it is clear that there are also significant opportunities that need to be considered when calculating the financial implications of environmental reform.

The primary motivation for enterprises to engage environmental sustainability varies. Some are driven by a steadfast commitment to making sure their (and our) children have a planet which can sustain them into their futures. Some are embarking on research, analysis and projects to identify how they can reduce their carbon footprint and improve their standing as responsible corporate citizens. Others are aiming to prepare themselves for imminent legislative and market imperatives, seeking ways to identify and address cost implications of their carbon emissions. Many are looking to capitalise on the opportunities this new environment offers through new products, processes and marketing strategies. Whatever the initial driver, environmental sustainability initiatives must make business sense.

Enterprises engaging environmental sustainability need to examine the impact on the triple bottom line to properly assess the value of initiatives.

No one solution will be the right approach for everyone - thorough business analysis will be required to assess the business case for each individual company.

There are a number of initial questions that can help to consider a project’s value for an individual enterprise:
- What is it intended to achieve?
- What is the start up cost or investment?
- How long will it take to breakeven? What is the payback period?
- What are the mid and long term financial gains?
- What are the expected environmental gains?
- What are the associated risks?
- What are the ongoing running and maintenance costs?
- What are the social benefits?
- How does it support the corporate goals, mission statement and direction?
- What support is available?

The payback period of projects is a key deciding factor when prioritising which initiatives are scoped for implementation. Research conducted by the National Framework for Energy Efficiency has found that for the Australian manufacturing sector there are, on average, 23 percent of energy efficiency opportunities with a four year or less pay back period, and up to 45 percent energy efficiency opportunities with an eight year or less pay back period. However, many companies are already reporting that the actual gains of their environmental initiatives are exceeding payback expectations. There are increasing examples of enterprises which are finding that environmental sustainability initiatives are making good business sense and having surprising gains on the bottom line.
A collaborative project with the Environmental Protection Authority (EPA), metal finishing industry and Melbourne’s 4 metropolitan water businesses, identified 91 ways the industry could save on water, waste, energy, materials or labour that would result in $257,000 savings a year, payback in approximately 2.2 years and reduce greenhouse gas emissions equivalent to taking 228 cars off the road.

Ford Australia’s stamping plant in Geelong, which is recognised for its ISO 14001 Environmental Management System certification, undertook an audit to address its ageing lighting system. By retrofitting its 400w metal halide lamps with a new energy efficient 350w pulse-start metal halide lamp it reduced its energy consumption by 19%. The project cost was $378,000, and with energy savings of $349,000 p.a., the payback period was a little over 1 year. Aside from reducing ongoing operating costs for the business and directly impacting the company’s profit margins, the project has reduced gas emissions by 828 tonnes annually (and by the way, Ford staff are also enjoying the improved lighting).10

Midland Brick’s energy audit paid dividends to its triple bottom line with total expected savings to be approximately 109,371 GJ and 5,400t of CO₂ emissions per annum or 6.5% of the total energy used at the site. (See case study for more details)

Laminex environmental improvements initiatives will see reduction in water consumption by approximately 70%, liquid waste disposal by approximately 95% and solid waste disposal by approximately 80%, slashing the company’s rising waste disposal costs.

What these early adapters are achieving is based on strategic leadership and decisive action - a move which will help to position them as good corporate citizens, market leaders and innovative enterprises. This will strengthen their position against the competition and increase the value they offer to both customers and communities. This proactive approach also ensures that their transition to become more environmentally sustainable manufacturers is both cost effective and profitable.

Thirty years ago these may have been risky ventures. Today however, with the help of technology, support from sustainability advisors, funding from Government and industry bodies, and a greater understanding of the intricacies of the organisational environment, projects are delivering on a lot more than just sustainable good practice. Manufacturing companies are able to prepare and execute business cases that economically, socially and environmentally justify changes to processes, facilities, equipment and resources, in order to deliver real benefits.

Section two

Setting a course of action

Starting with fundamental principles

MSA is aware of the mixed messages and confusing array of ‘solutions’ that are currently bombarding industry, and are committed to providing support that is meaningful and relevant to individual enterprises. The manufacturing industry has undergone far too many challenges in recent years to be drawn into new activities that are not effective in meeting compliance obligations or that do not have a real impact on reducing its carbon footprint.

Research conducted by Ai Group and MSA clearly shows that there is extensive misunderstanding about what is expected by enterprises with regard to carbon reduction initiatives and a real lack of confidence from many about where to start. The Industry Skills Councils (ISCs) have developed a set of guiding principles to direct their work in assisting industry to pursue sustainable outcomes. These provide a helpful position from which to begin.

Fundamentally, the key message of these guiding principles is that there is no ‘one’ solution, no ‘one fits all’ approach.

Industries, even enterprises must approach environmental sustainability according to their own specific needs and conditions, assessing what, when and how initiatives are best implemented to maximise environmental outcomes and cost efficiencies. Essentially, it is about ‘keeping it real’ for individual enterprises. Ai Group and MSA are actively discouraging the development of policies, solutions or indeed any approaches that are based on an assumption that industries and enterprises can be addressed in the same manner, or that environmental or ‘green’ initiatives are of value purely on the basis that they are considered ‘green’.

The ISC principles are that:

1. Environmental sustainability must be approached in a manner that is industry and enterprise specific. Research confirms that environmental sustainability has different meaning and affects in different industries, even different sectors, enterprises and jobs. Unless activity is targeted specifically, it will lose relevancy and usefulness.

2. Environmental sustainability skill needs will emerge in an incremental way and at different rates from industry to industry, enterprise to enterprise. Those sectors affected by compliance requirements will be primary instigators for new developments in technology and work practices, while those with voluntary drivers will generally be slower.

3. Environmental sustainability workforce development initiatives must add value to the enterprise. It is important that skill development adds to workforce capacity in a meaningful way and does not add unnecessarily to the burden faced by enterprises in meeting the new focus of environmental sustainability.

A call for strategic leadership

- ensuring participation at all levels

Environmental sustainability and efficiency practices, like any business influence, present risk and opportunity. Organisations will need clear and direct leadership to define how business is to be conducted, based on a new set of market factors. Because environmental sustainability in its application across the whole of the business sector is still relatively new, there are many aspects that will inevitably shape leadership thinking. It is however leadership and decision making that is needed to drive appropriate business activity. It will be important for leadership to differentiate between altruistic motives, scatter-gun enthusiasm and good business sense, and set the strategic direction accordingly.

Government

Government bodies at both a state and federal level have a clear commitment to making the transition to a low carbon economy. While there are still concerns about the effectiveness and appropriateness of various government initiatives (increasing regulation and compliance, and coordination between departments being key issues), there are undoubtedly now a range of government supports available to help enterprises move the agenda forward. Some of these are identified in Section 3 of this report (Appendix 1). Government development and provision of expertise, support and strategic influence is essential to enable businesses to make the transition. Government will play a significant role in ensuring that the Australian economy is well positioned both domestically and internationally to tackle climate change.

Funding initiatives must be provided in a way that is both easily accessible and timely to enable business to make the transition to low carbon production as economically as possible. The avoidance of ‘red-tape’ and overly administrative practices which add further burden, along with an integrated and coordinated approach by government agencies, will mean businesses can concentrate their efforts on making the necessary economic, environmental and social sustainability changes throughout their organisation.

It is essential that government leadership is responsive to the realities that industry is facing. Industry bodies such as Ai Group are working closely with Government to determine workable goals for industry and provide strategic support and expertise to enterprises; while the Industry Skills Councils such as MSA are working to drive workforce development activity towards industry specific, incremental strategies that add value to the organisation’s bottom line and provide the skills to deploy sustainability directives.

Industry

The results of the Ai Group/KPMG survey of 400 CEOs, show that there are also a number of key challenges for business leaders. Based on the study findings, it is evident that only a small number of manufacturers have conducted the necessary analysis and built or sourced the required capabilities to prepare for CPRS and trade in a low carbon economy. It also highlights that there is significant lack of understanding about CPRS. This position is likely to place these companies at a distinct disadvantage in the marketplace and result in a reactive response to the CPRS rather than a guided, staged approach aimed at mitigating increased cost and compliance obligations once CPRS begins.
Section two
Setting a course of action

Manufacturing industry leaders will need to build a framework that defines their strategic leadership domain for sustainability and guides the tactical and functional elements at the operational level. As businesses move into a new era where environmental sustainability is a growing influence on almost every aspect of the industry, an adaptive capacity is required by leaders to redefine the way for manufacturing.

The diagram above illustrates some of the factors and influences that leaders need to grapple with in order to position their business effectively in this new arena.

An attitudinal shift is required at both the leadership and operational level where all members of the enterprise must take personal and professional responsibility for adapting to the influences of environmental sustainability and what it means in the workplace. Building a capacity to work under new terms and conditions will mean investment of time, effort and energy; with the reward being growth, development and new opportunities. For those who will be significantly impacted by the new carbon economy, a systemic change is needed, one which must be endorsed and driven from the top and fueled with a competent workforce.
While there are many new skills that will be required, there are a majority of applications that will require existing skills or modification to existing skills.

**Skills for sustainability**

‘We need a broad understanding of sustainability that permeates everything we do and that involves everyone in the organisation including managers, employees and stakeholders.’

When MSA first began analysing the impacts of a low carbon economy on the skill needs of the manufacturing workforce, it became quickly evident that sustainability would be an attitude, position, approach and application of skill that must be embedded and integrated into every part of the organisation. This finding has been supported by further research conducted over the past 12 months. However, as greater understanding and more experience emerges, the requirements at each level are becoming clearer and MSA is able to be more specific about what skill development initiatives are most useful at this stage.

MSA adopts the position of the Industry Skills Councils that skill development activity must be specific to the industry sector and indeed the enterprise and job role; should be designed to make skills available when they are required; and must result in making a valuable contribution to the enterprise’s bottom line. In other words, skilling for sustainability, like all sustainability initiatives, must make business sense.

There is currently a great deal of discussion on what has been coined ‘the green collar economy’ and what constitutes a ‘green collar worker’ and a ‘green skill’ for this new era of sustainability. While MSA does not believe the descriptive ‘green’ helps to clarify what it sees as a far more complex issue, it is useful to unpack some of the concepts that are influencing both policy development and application of initiatives.

In its report to establish a taxonomy and definition on which to base employment research, using ANSCO and ANZSIC categories, the Department of Environment and Climate Change NSW (DECC) and the Environment Institute of Australia and New Zealand suggest that there are ‘three key factors that describe a green collar worker: the skills and responsibilities of the individual, the industry and nature of the organisation for which they work, and whether the job and the organisation tend towards the environmental or sustainable end of the green spectrum’.

The report differentiates between sustainable and environmental to clarify that these terms are not interchangeable. It distinguishes that ‘in general, environmental practices tend towards specific physical processes, and sustainable practices tend towards more generalised processes, or even intangible areas like policies and attitudes’. Similarly, the Industry Skills Councils have determined that the terms ‘green’ and ‘sustainable’ can easily confuse the agenda when interpreted to have the same meaning. Clearly there is still work to be done in generating a shared language when it comes to defining the skill implications of a low carbon economy.

While there are many new skills that will be required, there are a majority of applications that will require existing skills or modification to existing skills. For example, fundamental manufacturing skills such as quality checking, monitoring, testing, measuring, reporting, machine operations, waste disposal etc. are transferrable skills that can be applied to a wide range of production processes, including emerging processes arising from sustainability adjustments. Whether they now be deemed ‘green’, ‘sustainable’ or ‘environmental’ skills will more likely refer to the net outcome achieved rather than the skills themselves. These skills are already well embedded and provided for in MSA’s national training qualifications and workforce development programs across industry. However, additional input may well be required to contextualise some
Section two
Setting a course of action

of these skills to target environmental sustainability aspects. MSA is currently incorporating environmental sustainability into relevant units and qualifications to ensure that this additional context is covered within the training system.

But environmental sustainability will also call on some new skills at both a broad level and for specific applications. Already it is clear that manufacturing will need to ensure it has the skills to:

• Maximise efficiencies and minimise waste at all levels of production, incorporating new information on processes, materials and technologies;
• Innovate and design new, more energy efficient and environmentally sustainable products, processes and technologies and embrace new applications;
• Recycle and reuse, and implement pollution control and waste by-product management;
• Build business development capabilities that can identify new market opportunities as a result of sustainability related changes;
• Establish efficient international supply chains based on environmental performance indicators;
• Conduct environmental risk analysis;
• Conduct life cycle analysis of products to determine embedded carbon values;
• Develop compliance strategies and management including environmental auditing and environmental impact statements; and
• Measure, monitor and report on carbon emissions and environmental performance.

According to the Ai Group / KPMG survey, enterprises do not currently believe that they are adequately prepared on the skills front to manage the transition to sustainability and are aware that they need to take action to increase their capacity.

• Just less than half of the respondents (45%) believe they currently possess internal capabilities to manage the direct and indirect impacts of the CPRS.
• 60% of firms intend to boost the capacity of their personnel to manage the impacts of the Scheme.
• Around 38% of the CEOs with internal capabilities to assist managing the impacts of the CPRS plan to further develop the capabilities of their personnel in these areas.
• About one-third of businesses call on external advice to assist in managing the CPRS and around 45% plan to use external assistance during the next three years.
• A significant proportion of firms (29%) have utilised external advice for assistance in dealing with the CPRS and plan to use similar sources over the next three years.
• One in five companies does not currently possess internal capabilities to manage the impacts of the CPRS and have no plans to acquire or develop these in the near future.14

MSA is committed to providing leadership in helping manufacturing industries access and develop the skills they need to compete in a sustainable future. It already has a suite of targeted sustainability units available for incorporation into all its qualification outcomes and is expanding on these as new skill needs emerge. New qualifications that target some of the job roles identified earlier are currently under development. Flexible training pathways are being developed to allow the transference and updating of skills that will be necessary.

14. ‘Gearing up’ survey Ai Group and KPMG
The Competitive Manufacturing qualifications, MSA’s flagship product, provide a key strategic response to environmental challenges, and are currently being expanded and broadened to incorporate an environmental focus. The waste and efficiency focus of these qualifications are becoming increasingly relevant for a wide range of industries, beyond manufacturing.

MSA is also establishing a range of strategic partnerships to implement projects that provide resources and support for skill development in the manufacturing workforce. It has developed a comprehensive Resource Manual to support the implementation of training in sustainability, with Swinburne University’s National Centre for Sustainability and the NSW Department of the Environment and Climate Change.

MSA sees the development of the manufacturing workforce as its core business and will stay at the forefront of sustainability workforce issues as they arise. Its strategic response will be guided by a commitment to keeping it relevant for its stakeholder industries and ensuring that workforce development initiatives are specific to job needs, available when they are needed and meaningful to the enterprise’s bottom line.

Lean principles and tools
– a key strategy for sustainable manufacturing

There is a strong synergy between lean manufacturing principles and principles of sustainability. Lean manufacturing has, as its prime target, the reduction of ‘muda’ otherwise known as ‘waste’; not only the kind of waste we put in the bin, but any activity in production or supply chain processes that does not add value to meeting the needs of the customer. The needs of the customer may be in price, quality, availability, speed of delivery or a number of other factors, including environmental sustainability. Kaizen (continuous improvement) is a key technique applied across the organisation to increase value while reducing muda (waste). Decreasing waste, increasing value, and embarking on continuous improvement are at the heart of reducing carbon impacts and strongly align with key principles of environmental sustainability.

Manufacturing enterprises in Australia have been increasingly implementing lean manufacturing principles to improve their efficiencies and profits in a highly competitive global market and many have been doing so for years. In fact lean enterprises are perhaps some of the unsung stars in sustainable manufacturing. Lean manufacturing offers these enterprises a key strategy for targeting environmental improvement. For those that have not taken a lean approach to their businesses, lean tools provide a strategic way forward in determining opportunities that are specific to their operations and can result in improvements to environmental performance.

Developed by the Toyota Motor Company in Japan and based on concepts pioneered in the U.S. by Henry Ford, Edwards Deming and others, lean now has application and relevance beyond manufacturing into all industries and services.
wanting to reduce their waste and improve their environmental performance.

Manufacturing Skills Australia is keenly aware of the strategic advantage that is available from the dissemination of lean manufacturing skills throughout all levels of the organisation, and is currently reviewing and expanding on its Competitive Manufacturing units and qualifications to ensure that they offer enterprises skills that will help the organisation transition to the low carbon economy.

Lean principles can be applied across all manufacturing operations and support cleaner production by identifying environmental waste and inefficiencies and inform design, development and application of more sustainable solutions.

Some companies that know the significant gains that can be made through lean skills are quicker to recognise how lean supports improved environmental outcomes. Atlas Copco is one example of how early adaptation of sustainability through lean can provide a leading edge on competitors. Atlas Copco is a world leading provider of industrial productivity solutions that range from construction and mining equipment to compressed air and gas equipment, generators, industrial tools and assembly systems to related aftermarket and rental.

In its Australian operations, the company is very serious about improving its carbon footprint and is implementing an organisation-wide skills development program to engage its entire staff in its lean, sustainability transformation. It is rolling out training to frontline management in lean principles and engaging them in workplace projects to identify opportunities for operational and sustainability improvements. For example it is using Lean tools to look for opportunities that specifically target energy waste and meet improvement targets. The company has also designated an employee engagement team to ensure the efficient and accurate communication of lean and sustainable opportunities and learnings throughout the organisation and holds monthly environmental, lean toolbox discussions. Atlas Copco is ranked in the top 100 companies within the Standard and Poor's World Index of Sustainability.

By undertaking a lean analysis with an environmental perspective, new opportunities can be identified that would not be recognisable through narrow lean analysis methods. For example, space may be assessed not only for its impact on production flow efficiencies, but also on its energy impact for heating or air conditioning requirements. This allows environmental waste to be quantified when assessing new business case opportunities. Lean processes can identify cost and environmental savings in materials use, waste disposal, pollution control and hazardous waste requirements, energy use and compliance amongst others.

The U.S Environmental Protection Authority promotes the link between lean practices and environmental innovation as a key approach for U.S. enterprises to embrace environmental sustainability. It provides many examples of lean tools achieving sustainable outcomes. For example:

- The Boeing Company realised resource productivity improvements of 30-70 percent from lean initiatives, eliminated the use of 10 m³ of cardboard and bubble wrap packing material per 747 wing panel set and reduced chemical usage per airplane by 11.6 percent.
- Columbia Paint and Coatings generated environmental savings from lean activities that included a reduction of 7t of paint solids from
wash water, saving of 8t of shrink wrap and removal of 1300 kg of hazardous materials from the waste stream.

• General Motors implemented Saturn Kanban and saved 17t per year in air emissions, eliminated 258t per year of solid waste, reduced hazardous waste generation from 4 kg per car to 1.5 kg per car.

• 3M reinvigorated its highly successful pollution prevention program by training more than 55,000 salaried employees in Lean Six Sigma since 2001 and involving them in improvement projects that often have environmental benefits. This contributed to 3M exceeding its corporate Environmental Goals from 2000-2005, reducing volatile organic compound (VOC) emissions by 61 percent, Toxic Release Inventory releases by 64 percent, waste generation by 30 percent and energy use by 27 percent (when indexed to net sales).16

In Australia, continued and increased skill development and business support for implementing a lean approach to environmental issues will be a major focus for MSA for its manufacturing industry stakeholders.

Section three

Moving the agenda forward

Positioning and leverage for the future

There are many factors at various levels of society that are influencing the sustainability direction of the manufacturing industry. Are they fully integrated, effectively structured and properly coordinated? Perhaps not yet, but they are providing industry with opportunities that will help to establish environmental sustainability strategies and a path to action.

In response to the Global Financial Crisis, governments internationally are employing programs of economic stimulation. Considerable funding within these programs is being dedicated to environmental sustainability objectives, with 15% of all global fiscal stimulus packages already allocated to low carbon measures. This equates to more than $US430 billion, three quarters of which is expected to filter through the global economy between 2009 and 2011. This is only the beginning as countries prepare to improve their carbon position through economic reform. Furthermore, the current level of funding suggests that environmental sustainability is fast becoming a growth industry in itself.

Each Australian state and territory government, various industry bodies, private companies and the federal government are positioning services and funds so that the manufacturing industry may make a successful transition into a low carbon economy. It is not expected to be easy or immediate, and like any transformation that has such wide reaching impacts, there will be challenges along the way.

Already, a number of foundational programs are in place and have assisted the industry’s ‘early adopters’ to become more environmentally sustainable. Today, there is an even greater proliferation of programs, initiatives, funding grants and rebates to support manufacturing organisations to do the same.

Program services focus on everything from strategic planning, measurement and business impact analysis through to the development of new skills, methodologies, tools and templates for running projects that drive sustainability outcomes. Businesses that are able to develop and execute plans that leverage the available funds will make the transition far more economically. Grants are continually changing in their objectives and target audience, based on social, economic and business needs, making it all the more important for manufacturers to identify opportunities and take action as soon as practically possible.

MSA and the Ai Group have had a string of successes in working with companies to develop environmentally sustainable capabilities. Whether it’s a sustainability audit to identify possible impacts, opportunities and risks, the development of targeted workforce development initiatives, or the financing of a project to bring to market a new product innovation, there are many sources of intellectual and financial capital available to businesses to support industry in this time of transition.

The tables outlined in Appendix 1 provide a snapshot of some of the current and future environmental sustainability programs and initiatives, including funding opportunities that are available to the manufacturing industry. With so much information available, attempting to determine which direction to take and what action is required, business must leverage all available resources with their depth of knowledge, experience and funding.

The manufacturing industry is facing significant challenges, in particular being able to assess the degree of impending change and managing the timing so that each step towards environmental sustainability delivers outcomes that add value. It’s therefore critical that the leadership with the
Businesses that are able to develop and execute plans that leverage the available funds will make the transition far more economically.

Support of industry bodies and Government continue to invest time, money and energy in-order to adapt successfully. This “movement” may start as an environmental driver of change, but will soon become an economic and social imperative.
## Appendix 1

Examples of programs, services and funding initiatives currently available to assist manufacturing enterprises to transition to the low carbon economy.

### Sustainability Programs and Services

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<thead>
<tr>
<th>Name</th>
<th>Source</th>
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<tbody>
<tr>
<td>Knowledge and Skills for Sustainability Resource Manual</td>
<td>MSA and the National Centre for Sustainability (Swinburne University of Technology)</td>
<td>Sustainability standards manual designed to facilitate teaching and learning in the three guideline units - MCMT272A Participate in environmentally sustainable work practices - MCMT472A Implement and monitor environmentally sustainable work practices - MCMT672A Develop workplace policy and procedures for sustainability <em>(Funded by: NSW Department of Environment and Climate Change)</em></td>
<td>Guideline Brief - Teacher/mentor guide - Learner guide, and - Resource Toolkit (including program references, factsheets, checklists and industry information).</td>
<td>MSA Phone +612 9955 5500 Web <a href="http://www.mskills.com.au">www.mskills.com.au</a> Swinburne National Centre for Sustainability Phone +613 9210 1903 Email <a href="mailto:ncs@swin.edu.au">ncs@swin.edu.au</a></td>
</tr>
<tr>
<td>Energy and Sustainability Helpdesk</td>
<td>Ai Group</td>
<td>Ai Group provide a range of service and support functions that include lobbying government on behalf of the industry, promotion of networking opportunities and the provision of services to help companies engage in more sustainable business practice.</td>
<td>Ai Group have established: - An ‘Environmental Working Group’ - A ‘Sustainable Business Network’ and newsletter - An ‘Environmental Solutions Forum’ (focusing on identifying industry specific solutions) - Environmental sustainability training and workshops Additionally they have a range of case studies, fact sheets, regular industry briefings and a members only access to a database on government funding (state and federal)</td>
<td>Ai Group Phone 1300 733 752 Web <a href="http://www.aigroup.com.au">www.aigroup.com.au</a> Email <a href="mailto:sustainablebusiness@aigroup.asn.au">sustainablebusiness@aigroup.asn.au</a></td>
</tr>
<tr>
<td>Resource Smart Energy Efficiency Best Practice Guides CD Rom</td>
<td>Sustainability Victoria</td>
<td>Provide a step-by-step guide to improving energy efficiency in compressed air systems and achieving best practice. The program will enable industry to determine the changes that can be made in order to reduce operating costs, improve equipment operation and performance and environmental outcomes. The guide has been developed to lead decision makers and service providers through system changes.</td>
<td>Includes identification of opportunities and strategies for improving systems and efficiencies. Tips in designing new systems including measurement techniques. Advice in selecting service providers. <strong>Areas covered:</strong> - Compressed air systems - Industrial refrigeration - Lighting - Pumping systems - Steam systems, hot water systems and process heating systems</td>
<td>Sustainability Victoria Phone +613 8626 8700 Email <a href="mailto:info@sustainability.Vic.gov.au">info@sustainability.Vic.gov.au</a></td>
</tr>
<tr>
<td>Sustainability Advantage Program</td>
<td>Department of Environment and Climate Change (DECC) NSW and the Ai Group</td>
<td>Business support service designed to help organisations understand sustainability, successfully manage for a better environment and add business value. Includes the Sustainability Advantage Program, the Sustainability Advantage Energy Saver Program and the Energy Efficiency for Small Business Program.</td>
<td><strong>Program workshops target:</strong> - Vision, Commitment and Planning - Supply Chain Management - Climate Change - Resource Efficiency - Staff Engagement - Environmental Risks and Responsibility - Cleaner Production Self-help Tool</td>
<td>Department of Environment and Climate Change NSW Contact Business Partnerships Phone +612 8837 6000 Email <a href="mailto:info@environment.nsw.gov.au">info@environment.nsw.gov.au</a></td>
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## Sustainability Programs and Services

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<tr>
<td>Low Carbon Innovation Project</td>
<td>NSW Department of State and Regional Development</td>
<td>The project is being developed with the Department of Environment and Climate Change. It investigates drivers and impediments to the possible take-up of low carbon technologies and processes and identifies opportunities for government and industry action. The NSW DSRD is the State Government’s business development agency. It works with domestic and international firms, assisting them to invest in Sydney.</td>
<td>Services available:  - Advice and market data to assist business planning  - Use of the NSW Government’s Trade and Investment Centre to launch new products and services  - Direct engagement with key decision makers in Government.</td>
<td>NSW Department of State and Regional Development  Contact Innovation Unit  Phone +61 2 8222 4884  Web <a href="http://www.business.nsw.gov.au">www.business.nsw.gov.au</a>  Email <a href="mailto:innovation@business.nsw.gov.au">innovation@business.nsw.gov.au</a></td>
</tr>
<tr>
<td>Resource Efficiency Partnerships</td>
<td>Environmental Protection Authority (EPA Victoria) and Ai Group</td>
<td>Range of partnership and leadership functions that broker agreements and investment relationships. These programs assist industry in improving their environmental sustainability capabilities.</td>
<td>Government partners  - Local industry efficiency programs Industry partners  - Industry sustainability covenants (funding and project management support) Water partners  - Industrial waste water treatment programs</td>
<td>EPA  Phone +613 9695 2722  Web <a href="http://www.epa.vic.Gov.au/bus/partners/stakeholders.asp">http://www.epa.vic.Gov.au/bus/partners/stakeholders.asp</a>  Ai Group  Contact Vicki Pryse  Email <a href="mailto:Vicki.pryse@aigroup.asn.au">Vicki.pryse@aigroup.asn.au</a></td>
</tr>
<tr>
<td>Audit Assist Program</td>
<td>Ai Group</td>
<td>Ai Group provides an environmental audit service to manufacturing companies to assist with identification of environmental and business risks, prioritization of initiatives and development of action plans.</td>
<td>The audit services focus on:  - Management systems (EMS, ISO 14001) and environmental, quality and OHS audits  - Compliance audits  - Contaminated site audits  - Due diligence environmental audits, and  - Water, energy and waste audits The audit assist program also provides tools, workshops and development programs to improve environmental compliance capabilities and outcomes</td>
<td>Ai Group  Phone 1300 733 752  Web <a href="http://www.aigroup.com.au">www.aigroup.com.au</a>  Email <a href="mailto:sustainablebusiness@aigroup.asn.au">sustainablebusiness@aigroup.asn.au</a></td>
</tr>
<tr>
<td>Grow Me The Money Program</td>
<td>EPA and Victorian Employers’ Chamber of Commerce and Industry (VECCI)</td>
<td>A 12 month online program designed to help small-to-medium sized businesses become more environmentally sustainable and save money. Simple and practical tools for SMEs to learn from other businesses about the commercial benefits of environment-friendly initiatives.</td>
<td>- Case studies  - Resources  - Funding sources  - Potential partners and mentors  - Practical tips  - News, and  - Events</td>
<td>Grow Me The Money  Phone +613 8662 5480  Web <a href="http://www.growmethemoney.com.au">www.growmethemoney.com.au</a>  Email <a href="mailto:enquiries@growmethemoney.com.au">enquiries@growmethemoney.com.au</a></td>
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## Appendix 1

Examples of programs, services and funding initiatives currently available to assist manufacturing enterprises to transition to the low carbon economy.

### Sustainability Programs and Services

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</table>
| Carbon Innovators Network Initiative | EPA | Network to share knowledge and stimulate debate in carbon management. To help organisations strategically and practically address carbon emissions, and in doing so, transform climate change from a business cost to a business opportunity. Stimulate debate and innovation in carbon management and provide the support and tools businesses require to develop appropriate carbon management strategies. | - Discussion forums with key climate change innovators; - Public recognition opportunities for highlighting their innovative carbon management strategies; - Tailored business support and advice from EPA as required; - The opportunity to determine the tools and resources EPA develops; and - Opportunities to partner with other network members on specific carbon innovation projects. | EPA  
Phone +613 9695 2722  
Email carbon.innovators@epa.vic.gov.au |
| WaterMAP Assist Program | Ai Group | Working with industrial water users (esp those using > 10 ML year) to identify ways to reduce water consumption through reduction, re-use and recycle. | Program focuses on delivering:  
- Technical assistance  
- Practical seminars  
- Funding for water saving initiatives  
- Case studies and  
- Fact sheets | Ai Group  
Contact Ai Group’s waterMAPs Industry Advisor  
Phone +613 9867 0145  
Web www.aigroup.com.au  
Email watermapassist@aigroup.asn.au |
| Carbon Assist Program | Ai Group | The program provides customised assistance to industry. The objectives are to save energy, reduce emissions and minimise exposure to continuing energy prices. | Program services include:  
- Energy audits (levels 1, 2 and 3)  
- Greenhouse gas emissions inventories  
- Energy management training and reporting | Ai Group  
Contact Energy and Sustainable Business Help Desk  
Phone 1300 733 752  
Email sustainablebusiness@aigroup.asn.au |
| Energy Efficiency Opportunity Program (EEOP) | Department of Resources, Energy and Tourism | The (EEOP) program encourages large energy-using businesses to improve their energy efficiency. Businesses are required to identify, evaluate and report publicly on cost effective energy savings opportunities. EEOP is designed to lead to improved identification and uptake of cost-effective energy efficiency opportunities, improved productivity and reduced greenhouse gas emissions by large energy consumers. | Provision of resources including:  
- An assessment handbook  
- Templates  
- Case studies  
- Preparation workshops  
- Measurement guides, and  
- Management information. | Department of Resources, Energy and Tourism  
Phone +612 6276 1000  
Email ret@ret.gov.au |
| Greenhouse Challenge Plus Program | Department of Environment, Heritage, Water and the Arts | The Greenhouse Challenge Plus program with their Greenhouse Energy Audit Tool has been developed to assist small to medium size organisations to identify actions to improve energy efficiency through simple and effective audit tools and develop plans for implementing energy efficient actions. | Emissions calculator: Energy Efficiency Audit Tools which assess the following business areas:  
- Lighting and lighting control  
- Boilers and steam systems  
- Ventilation systems  
- Air-Conditioning systems  
- Office equipment  
- Domestic hot water systems  
- Building insulation  
- Infiltration (air leaks into buildings)  
- Compressed air | Department of Environment, Heritage, Water and the Arts  
Contact Industry Advisor  
Phone +612 6274-1229  
Email greenhouse.challenge@environment.gov.au |
### Sustainability Programs and Services

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</table>
| Zero Waste Program          | South Australian Department for Conservation and Environment          | Zero Waste SA is established to help drive a new and integrated strategy for waste reduction, waste minimisation, recycling and waste disposal. Zero Waste SA is working on a new State Waste Strategy based on the principles of the waste management hierarchy: Avoid Minimise Reuse Recycle Recover Treat Dispose. | The program focuses on assisting: - Small enterprise to recycle at work, and - Large enterprise through the Resource Efficiency Assistance Program to assist with measuring resource usage from auditing waste, energy, water, systems and plant efficiency | Zero Waste SA  
Contact: John Blumson, 8204 2043, or Andrew Hutcheon 8204 8143  
Phone: +618 8204 2051  
Web: www.zerowaste.sa.gov.au |
| A New Car Plan For A Greener Future Program | Department of Innovation, Industry, Science and Research | This program is designed to assist automotive and component manufacturing companies in Australia to produce more fuel efficient and environmentally sustainable products for the local and export markets. The plan replaces the current Automotive Competitiveness and Investment Scheme (ACIS). | The program provides a range of industry support initiatives (as well as funding opportunities) including: - An automotive transition scheme replacing the ACIS  
- A green car innovation fund to assist in production of low emissions fuel efficient vehicles and parts  
- Auto industry structural adjustment program to help strengthen the vehicle components sector  
- Enhanced market access opportunities  
- Assist suppliers to be internationally competitive with a supply chain development program  
- Provide an Automotive Industry Innovation Council | Department of Innovation, Industry, Science and Research  
Contact: The Manager - Automotive Policy Section  
Department of Innovation, Industry, Science and Research  
Phone: +612 6213 7088  
Web: www.innovation.gov.au  
Email: auto@innovation.gov.au |
| Resource Smart Program      | Sustainability Victoria (with the Victorian Government and EPA)        | Resource Smart is a division of Sustainability Victoria that provides support, assistance and funding to businesses focused on developing environmental sustainability skills, knowledge and capabilities in the business sector. | The service and support offerings include: - Product Life Cycle analysis  
- Waste and Recycling  
- Energy and Water efficiency programs  
- Case Studies  
- Guidance on sustainability skills and knowledge development  
- Funding for projects and energy efficient business modifications (i.e The Sustainability Fund to fund various energy efficiency or waste reduction programs) | Sustainability Victoria  
Contact: Julie O’Brien  
Phone: +61 (03) 8626 8700  
Email: info@sustainability.vic.gov.au |

In Australia, continued and increased skill development and business support for implementing a lean approach to environmental issues will be a major focus for MSA for its manufacturing industry stakeholders.
# Appendix 1

Examples of programs, services and funding initiatives currently available to assist manufacturing enterprises to transition to the low carbon economy.

## Sustainability Funding Initiatives

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<tbody>
<tr>
<td><strong>Sustainability Covenant REWaRDS Program</strong></td>
<td>Environment Protection Authority (EPA) and Plastics and Chemicals industries Association (PACIA)</td>
<td>REWaRDS Program provides $3 million in funding to support PACIA and members to assist with waste and energy efficiency initiatives. Based on an earlier Sustainability Leadership Framework, this program focuses on delivery of projects.</td>
<td>The program will provide project funding for:  - Waste reduction  - Resource efficiency  - Build and integrate new sustainability capabilities across core business decision making processes  - Leadership development</td>
<td>EPA  Phone +613 9695 2722  Web <a href="http://www.epa.vic.gov.au">www.epa.vic.gov.au</a>  Email <a href="mailto:sustainability.covenant@epa.vic.gov.au">sustainability.covenant@epa.vic.gov.au</a></td>
</tr>
<tr>
<td><strong>Re-Tooling for Climate Change Program</strong></td>
<td>AusIndustry</td>
<td>The Re-tooling for Climate Change program ($75m over 4 years) will help small and medium sized Australian manufacturers reduce their environmental footprint, through projects that improve the energy and/or water efficiency of their production processes.</td>
<td>Funding for projects:  - $10,000 - $500,000  - Lean manufacturing  - Energy reduction  - Carbon emission reduction  - Energy efficient tools  - Co-generation plants  - Water recycling</td>
<td>AusIndustry  Phone 132846  Web <a href="http://www.ausindustry.gov.au">www.ausindustry.gov.au</a>  Email <a href="mailto:hotline@ausindustry.gov.au">hotline@ausindustry.gov.au</a>  Address (state and territory locations)</td>
</tr>
<tr>
<td><strong>CleanBiz Program</strong></td>
<td>Tasmanian State Government (Environment Division Department of Environment, Parks, Heritage and the Arts)</td>
<td>CleanBiz is a State Government funded sustainability program that helps Tasmanian enterprises adopt clean, lean and resource efficient practices that are good for the financial bottom line and the environment.</td>
<td>Provide funding for initiatives that:  - Reduce energy and water use  - Minimise waste and pollution, and  - Optimise the use of materials. <em>(Funding information available upon application)</em></td>
<td>CleanBiz Tasmania Sustainability Programs Section  Phone +613 6233 6879  Email <a href="mailto:CleanBiz@environment.tas.gov.au">CleanBiz@environment.tas.gov.au</a></td>
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<td><strong>ecoBIZ Program and Rebates</strong></td>
<td>EPA</td>
<td>ecoBIZ is the EPA’s signature partnership program with Queensland business and industry. ecoBIZ assists businesses to identify efficiencies in waste, water and energy for financial and environmental benefits. ecoBIZ provide project funding through a rebate scheme of up to $150k (30% of capital cost of sustainability initiatives)</td>
<td>The program provides:  - ecoBIZ Fact Sheet  - ecoBIZ Small Business Edition  - ecoBIZ Allies  - 6-step ecoBIZ process  - ecoBIZ Toolbox spreadsheets  - ecoBIZ Bulletin  - ecoBIZ Training  - ecoBIZ Facilitators</td>
<td>ecoBIZ  Phone 1300 369388</td>
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<td><strong>Resource Efficiency Assistance Program (REAP)</strong></td>
<td>Zero Waste SA (South Australian Government)</td>
<td>The REAP program is targeted at medium to large organisations. Companies are provided with assistance in measuring resource usage through auditing waste, energy, water, systems and plant efficiency. Provides management with a report on where savings can be made.</td>
<td>Funding: Zero Waste SA funds 100% of Stage 1 - walk-through waste assessment and report.  Stage 2 - waste audit and development of a resource management plan is subsidised for the business to a maximum of $25,000.</td>
<td>Zero Waste SA  Contact John Blumson, 8204 2043, or Andrew Hutcheon 8204 8143  Contact Zero Waste SA  Phone +618 8204 2051  Web <a href="http://www.zerowaste.sa.gov.au">www.zerowaste.sa.gov.au</a></td>
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| Supporting Green Jobs For The Future Program                          | NSW Department of Energy and Climate Change                             | Targeted assistance in green jobs and green skills development within NSW. The program will implement a statewide green skills strategy, increase green job opportunities, establish a ‘Green Skills’ taskforce and provide industry ‘Go To’ people to assist businesses. | The program will provide $20million in funding through the green skills taskforce for skills training. Skills development will focus on:  
- Support for training  
- Resources and support for trainers  
- Demonstration projects  
- Business guide  
- Skills to support NSW Government environmental initiatives  
- Green Skills Strategy summary information sheet  
- Green Skills Strategy implementation Plan  
- Elements of the Energy Efficiency Training for Trades and Professionals Program | NSW Department of Energy and Climate Change  
Contact  
Dept of State and Regional Development  
Phone  
+612 9338 6774  
Web  
Email  
anne.glover@business.nsw.gov.au |
| NSW Green Business Program                                           | NSW Department for Energy and Climate Change                           | The NSW Green Business Program provides $30 million over five years for projects that save water and energy in business operations in NSW.                                                                 | The program will provide $30million in project funding to deliver benefits across a range of broad business areas. The criteria is based on but not limited to:  
- education and technology trial activities that increase the adoption of efficient technologies and practices  
- projects which improve the efficiency of buildings, appliances and manufacturing processes  
- projects which reduce peak electricity demand, and  
- projects which reduce the demand for electricity or water supplied from electricity or water supply networks | NSW Department Energy and Climate Change  
Phone  
+612 9995 5000  
Fax  
+612 9995 5999  
Web  
Email  
ccf@environment.nsw.gov.au |
| A New Car Plan For A Greener Future Program                          | Department of Innovation, Industry, Science and Research               | This program is designed to provide financial assistance to the automotive and component manufacturing companies in Australia to produce more fuel efficient and environmentally sustainable products for the local and export markets. The plan replaces the current Automotive Competitiveness and Investment Scheme (ACIS).       | The program provides a range of funding opportunities including:  
- $3.4billion greener assistance program  
- $1.3billion for production of low emissions fuel efficient vehicles and components  
- $116.3million to help strengthen the vehicle components sector  
- $6.3million for enhanced international market access  
- $20million to assist develop internationally competitive supply chain capabilities  
- $10.3million for an expanded LPG scheme | Department of Innovation, Industry, Science and Research  
Contact  
The Manager - Automotive Policy Section  
Department of Innovation, Industry, Science and Research  
Phone  
+612 6213 7088  
Web  
www.innovation.gov.au  
Email  
auto@innovation.gov.au |
MSA would like to acknowledge the many valuable contributions that informed this report.

This report has been produced with the assistance of funding provided by the Australian Government through the Commonwealth Department of Education, Employment and Workplace Relations.

We extend an open invitation for all of our stakeholders to continue to work with us in developing and improving workforce development for manufacturing and automotive industries.

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Phone: +612 9955 5500
Web: www.mskills.com.au