Manufacturing Skills Australia
Sustainability Framework

V3.5
November 2011

Manufacturing Skills Australia

Contents

Version history

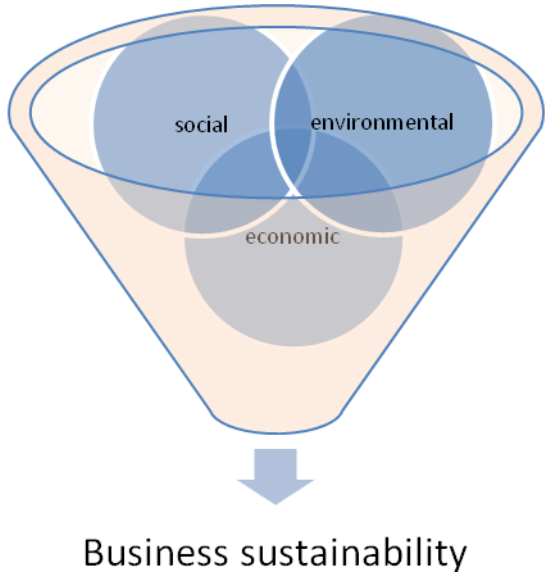
Version	Details	Changes/comments
V1.3 Trial draft	Release of draft to developers for review and feedback	N/A
V2	Working draft, not released	N/A
V3.4	January 2011 First release of Sustainability Framework	Incorporated feedback from developers and amendments from further research and editing, including: Amended wording in definition of sustainability – replaced 'survival' with 'viability' Added / edited descriptions to keywords tables, deleted overly generic keywords Added reference to October 2010 draft units from Sustainable Operations and Environmental Monitoring and Control Training Packages to 'possible useful unit/s of competency' Added / edited skills, knowledge and range to applications tables Added table showing relationships between areas of application (thanks to Faye Milroy) Changed name of area of application 'monitoring control and environmental technology' to 'Environmental monitoring, control and technology' to reduce confusion with general monitoring and control activities Removed index to avoid file corruption issues; use Word 'find' function
V3.5	November 2011 Second release to developers; publication via the Skills for Sustainability web site	References to units of competency have been updated with MSS codes Corrections to typos, updates to some hyperlinks The Sustainability Framework forms the basis of the Skills for Sustainability website, see http://www.sustainabilityskills.net.au. The website will contain the most up to date information. Note that it has fewer areas of application than the Sustainability Framework; Emergency and incident response is not included and workforce planning and workplace culture appears within procedures and planning.

Context

"Skills for sustainability, also known as green skills, are the technical skills, knowledge, values and attitudes needed in the workforce to develop and support sustainable social, economic and environmental outcomes in business, industry and the community." (DEEWR 2009)

However, the context is dynamic and embryonic. There is pervasive confusion with terms such as 'sustainable', 'green' and even 'environmental' used interchangeably in many contexts. Not only is the terminology not yet defined, industry practice is not fully developed nor embedded into general practice, although there are pockets of good practice and examples that could be shared.

This Sustainability Framework builds on the Review of Sustainability in MSA qualifications that was undertaken in March 2010. The review adopted concept that environmental, social and economic sustainability are necessary conditions for business sustainability in the manufacturing and automotive sectors.



In order to undertake the review of sustainability in the MSA qualifications, working definitions of sustainability were developed. The definitions reflected an internal and an external focus to each of the three aspects of sustainability highlighting the complexity of comprehensive sustainability practice. These are shown in the following matrix.

<table>
<tr><th colspan="2">MSA working definitions of sustainability</th></tr>
<tr><td colspan="2">Environmental sustainability
Requires that the enterprise's impact is sufficiently managed to ensure continued viability within the physical environment and of the physical environment.</td></tr>
<tr><td>Internally this applies in how an enterprise manages the environmental impact of its processes and activities</td><td>Externally in the design of its products and services to assist others to achieve sustainability.</td></tr>
<tr><td colspan="2">Social sustainability
Requires that the enterprise's impact is sufficiently managed to ensure continued viability within the community and of the community.</td></tr>
<tr><td>Internally this relates to issues including worker safety and satisfaction, consultative processes, ethical behaviour, responsibility, equity and diversity.</td><td>Externally the focus is on the impact on the community, for example, local infrastructure, community consultation and information strategies, reputation and 'good corporate citizenship'.</td></tr>
<tr><td colspan="2">Economic sustainability
Requires that the enterprise maximises its efficiency and competitiveness to support financial viability of the business.</td></tr>
<tr><td>Internally the focus is on reducing costs and eliminating waste.</td><td>Externally the issue requires balancing of the three aspects of sustainability – balancing:
financial goals
consumer and community demands for non-exploitative practices and
environmental sustainability.</td></tr>
</table>

About the Sustainability Framework

Aim

The Sustainability Framework aims to:

- bring together a body knowledge of relevance to environmental, economic and social sustainability in the MSA sectors
- support a shared understanding of sustainability in the MSA sectors
- identify sustainability skills and knowledge applicable in a range of contexts and job levels
- assist in consistent use of terminology and concepts across MSA qualifications and
- provide a point of reference for MSA Training Package developers in developing and reviewing units of competency and consulting with stakeholders.

Purpose

Sustainability is a complex, dynamic and somewhat embryonic field in which concepts, terminology, practice and skill needs are still developing. While significant effort has been made to reflect key aspects of the current paradigm the Sustainability Framework will benefit from ongoing input and enhancement as a 'living document'. It is intended as a reference to assist developers to capture the concepts and skills that are appropriate to their sectors and to articulate them in their units and qualifications.

The Sustainability Framework is designed to be used in a range of ways, for example:

- as a reference or a starting point in developing and/or reviewing units of competency - via the sample practices and skills and knowledge
- to facilitate discussions and consultations with stakeholders
- using the 14 areas of application as a check of sustainability coverage in qualifications, units, levels, resources and so on
- as a starting point for including sustainability in Employability Skills
- as a thesaurus of sustainability language and terminology – by searching or scanning the key words and descriptions
- referring to the 'possible useful units of competency' in the areas of application to see if they could be used or adapted to other sectors

Structure

Areas of application

The Sustainability Framework is structured around fourteen **'areas of application'** of sustainability practice. The areas of application refer to broad areas within the normal operations of most enterprises within the MSA Training Package sectors. These are outlined in the following section.

As this framework aims to be accessible from as many starting points as possible there are inevitable areas of overlap between the areas of application. For example, good governance requires meeting reporting requirements so there is overlap between Governance and strategy and Measuring and reporting.

Each area of application is structured to provide more detail about what it means and how to apply it, using the following sections:

- **Keywords and descriptions** – this is a list of key words and terminology which have been identified in researching sustainability; a description of what the term means or how it is used is provided for the less familiar and the more controversial terms. These are searchable and are listed in the index.
- **Sustainability Practice** – this section provides samples of practices across a range of job roles in a format consistent with parts of a unit of competency.
    - Application – these are intended to describe job role applications, but are not intended as complete 'application statements' for units
    - Skills – these identify some of the skills which might be required for the areas of application
    - Knowledge – identifies some of the underpinning knowledge for those skills
    - Range – shows some examples of the context of application
- **Examples** – these provide a brief summary of available case studies with links to source material
- **Possible useful units of competency** – these are units (endorsed or in development at time of writing) that relate to some aspect/s of the area of application; they are listed a possible reference material. These do not represent an audit of all MSA units of competency but have been identified as having potential for application/adaptation to other settings.

Additional information

The following sections provide additional information:

- A table of **Employability skills for sustainability** is included in the framework. This provides examples of sustainability application of the eight employability skills.
- A table showing the **Relationships between the areas of application** is also included in the framework. This reflects in a visual format the cross references listed in the introduction to each area of application.

Sources of information

The Sustainability Framework has drawn on a broad research base which includes desktop research, discussions with industry stakeholders, discussions with and feedback from Training Package developers and reference to MSA units of competency, including the 'in development' (at time of writing) Sustainable Operations and Environmental Monitoring and Technology projects.

Much of the information in the Sustainability Framework has now been transferred into MSA's Skills for Sustainability website at: http://www.sustainabilityskills.net.au Please refer to the web site for the most up to date information.

Areas of application

The Sustainability Framework is structured around fourteen 'areas of application' of sustainability practice. The areas of application refer to broad non-hierarchical areas within the normal operations of enterprises within the MSA Training Package sectors, as per Figure 1.

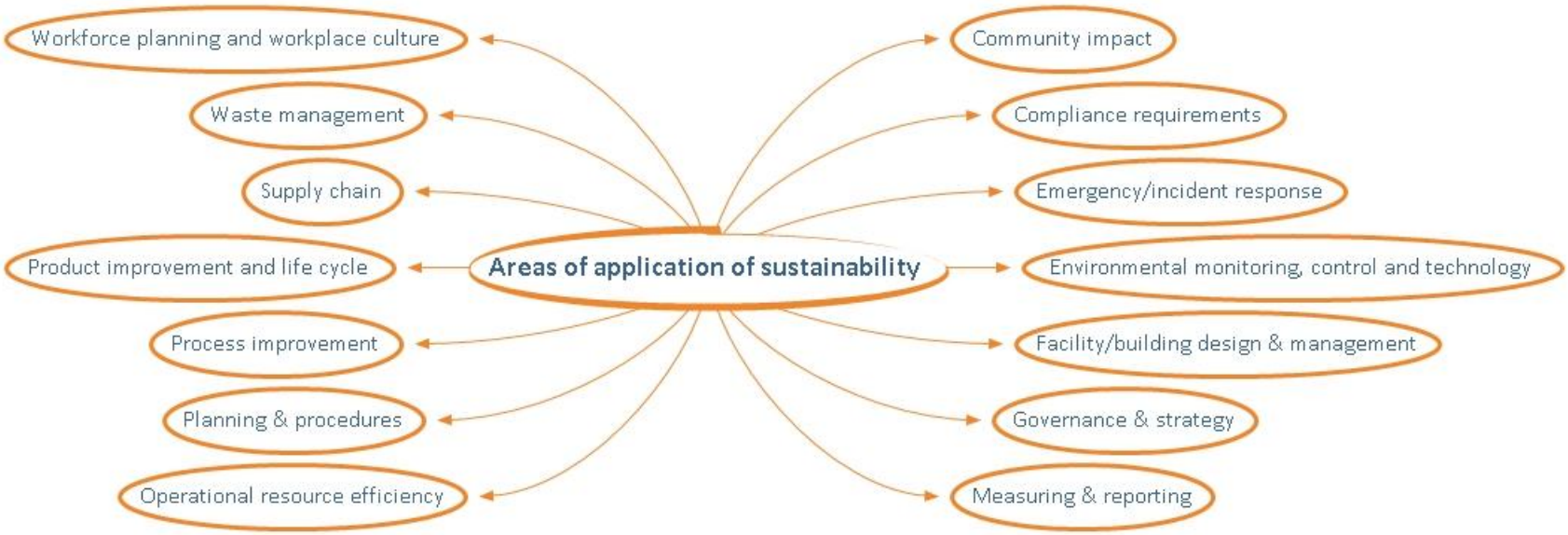


Figure 1: Areas of application of sustainability

In summary, the areas of application cover:

- **Community impact** which relates to assessing and managing actual / potential impact on the local and broader community; it is broadly aligned to social sustainability.
- **Compliance requirements** which relate to managing compliance with the range of codes, standards, reporting schemes, incentive programs, subsidies and legislative requirements that are currently in place or proposed.
- **Emergency / incident response** - sustainability is a significant issue in emergency and incident response due to the range of hazardous substances, dangerous goods and safety risks that are found within the MSA sectors. This is clearly articulated in sectors such as hydrocarbons processing where emergencies and hazards can have an obvious and direct impact on the physical environment, the workforce and the local community.
- **Environmental monitoring, control and technology** relates to using technology to monitor and control environmental sustainability.
- **Facility / building design and management** refers to 'big picture' building and facility management issues that are generally outside day to day operational activities.
- **Governance and strategy** relate to good governance and strategic planning at senior management and Board of Director levels.
- **Measuring and reporting** relate to the competencies required to measure and report on sustainability.
- **Operational resource efficiency** relates to identifying and implementing ways to reduce energy, fuel and water use and maximising the use of renewable / cleaner energy for the day to day operations of the business.
- **Planning and procedures** relates to planning for sustainability and developing procedures.
- **Process improvement** relates to identifying and implementing process improvements for the day to day operations of the business.
- **Product improvement and life cycle** relates to improving the sustainability features and performance of a product.
- **Supply chain** is about maximising the sustainability performance of the supply chain throughout the life cycle of the product.
- **Waste management** relates to the reduction waste in the broadest sense (inefficient use of capital / human / physical resources) and improved treatment and disposal of physical waste.
- **Workforce planning and workplace culture** relates to ensuring that the workforce has the skills to implement sustainable practices.

The following sections provide the detail for each area of application.

Community impact

This area of application covers assessing and managing actual / potential impact on the local and broader community; it is broadly aligned to social sustainability and is relevant to:

- Governance, strategy and organisational culture
- Compliance with access and equity, cultural heritage and land management requirements
- Recruitment policies and procedures
- Operational decisions on contracting and supply chain – for example local sourcing of supplies and contractors
- Social implications of decisions – for example the effect of reducing manufacturing on employment in the community
- Short and long term impacts on a community of construction projects or establishing new sites – for example influx of personnel, labour demand, accommodation

Please also refer to the following related areas of application **– Compliance requirements, Governance and strategy, Planning and procedures, Supply chain, Waste management and Workforce planning and workforce culture.**

Keywords	Description
Closure plans	Planning and managing the closure of a site and any impact on local infrastructure
Community health and safety issues	Self explanatory
Community relations	Information, consultation, dispute resolution mechanisms with local community stakeholders
Cultural ethics / sensitivity	Adhering to protocols for the use of cultural and ethnic icons, imagery etc
Cultural heritage	Cultural heritage refers to buildings, precincts, objects, ecosystems that carry aesthetic, historic, scientific or social value for past, present or future generations. They provide physical evidence of cultural practices and beliefs and contribute to a sense of national or cultural identity. See http://www.environment.gov.au/heritage/index.html

Keywords	Description
Displacement / involuntary resettlement	Involuntary displacement occurs when the decision of moving is made and imposed by an external agent. It can be caused by environmental degradation, natural disaster, conflicts or development projects. Causative factors may include loss of housing, shelter, income, land, livelihoods, assets, access to resources and services among others. Displacement affects not only those physically displaced but also the resident population (remaining) as well as the host population (new location). Resettlement is the process to assist the displaced persons to restore their socio-economic and cultural conditions.
Indigenous Land Use Agreements (ILUA)	A voluntary agreement about the use and management of an area of land or waters where native title exists or might exist. The agreement is made between one or more native title groups and others (such as miners, pastoralists or governments). A registered ILUA is legally binding on the people who are parties to the agreement as well as all native title holders for that area. An indigenous land use agreement is an agreement negotiated between a native title group and others, such as businesses or governments, about the use and management of land and waters. An indigenous land use agreement can be negotiated over areas where native title has, or has not yet, been determined to exist. They can be part of a native title determination, or settled separately from a native title claim. Indigenous land use agreements can be formed on the following topics: • native title holders agreeing to a future development • how native title rights coexist with the rights of other people • access to an area • extinguishment of native title • compensation. See http://www.environment.nsw.gov.au/jointmanagement/indigenouslanduseagreement.htm

Keywords	Description
Indigenous community impact	Self explanatory
Infrastructure planning	Self explanatory
ISO 26000: Social Responsibility Guidance Standard	ISO 26000 (published 1 November 2010) is an ISO International Standard giving guidance on social responsibility - what it means, what issues an organisation needs to address in order to operate in a socially responsible manner, and what is best practice. It contains voluntary guidance, not requirements, and therefore is not for use as a certification standard like ISO 9001:2008 and ISO 14001:2004. http://www.iso.org/iso/social_responsibility
Land management	Sustainable land management means managing land without damaging ecological processes or reducing biological diversity. It requires the maintenance of the following key components of the environment: • Biodiversity: the variety of species, populations, habitats and eco systems • Ecological integrity: the general health and resilience of natural life support systems, including their ability to assimilate waste and withstand stresses such as climate change and ozone depletion • Natural capital: the stock of productive soil, fresh water, forests, clean air, ocean and other renewable resources that underpin the survival, health and prosperity of human communities Land is often managed for multiple benefits, such as agricultural production, biodiversity conservation, water quality, soil health and supporting human life. To ensure long term sustainability, land managers must consider economic, social and environmental factors.
Social impact assessment / social impact statement	Social impact assessment includes the processes of analysing, monitoring and managing the intended and unintended social consequences of projects, initiatives and policies (etc) to promote a more sustainable and equitable biophysical and human environment. Social impact assessment usually covers key areas of potential impact such as: • Demographic - size and composition of the population, influx of temporary

Keywords	Description
	workers and tourists and awareness of community facilities and infrastructure • Economic – patterns of employment, real estate speculation, increased crime statistics and public safety issues, general economic effects such as housing and accommodation • Health and wellbeing – cultural, community health issues, family, heritage and social amenity issues • Institutional – zoning bylaws, land tenure and legal reforms.
Social inclusion and participation	Active engagement with disadvantaged and vulnerable groups to encourage and support their participation in learning, work, the community and decision making. The term is often used referring to people with a disability, indigenous Australians, the homeless and refugees. http://www.socialinclusion.gov.au/Pages/default.aspx

Sustainability Practice

Application	Skills	Knowledge	Range
Managers implementing community liaison / public profile activities such as marketing and promoting the company carbon emissions reductions	Engaging effectively with staff, stakeholders and local community Managing relationships with customers Consulting with the community Promoting community engagement Developing and sustaining networks with the local community Analysing stakeholders	Communication methods Scope of local community Impact of design and production options on carbon footprint Impact of design and production on local community	Internal customers External customers Carbon Management Response Plan
Supervisors / managers selecting contractors and materials to support	Identifying a range of options Evaluating potential impacts of options on	Supply chain issues, policies and practices Local suppliers	Factors to consider may include: Cost comparisons

Sustainability Practice

Application	Skills	Knowledge	Range
local communities	the local community Applying social management plans	Sources of local materials	Transport distances Availability of local labour and supplies
Supervisors / managers implementing employment strategies for particular groups	Consulting with stakeholders Identifying groups to target	Support services available Support services required Cultural ethics and sensitivities Company policy on inclusive employment Relevant Acts and Regulations	Particular groups may include: Women Youth People over 55 Indigenous people Locals People with a disability People returning to work
Operations / production workers applying OHSE procedures to prevent damage to local habitat	Applying company procedures Following Standard Operating Procedures Applying specific skills for the situation, eg not allowing waste water to flow into waterways	OHSE procedures to protect the environment Local environmental issues Site environmental issues	Local habitat may include: Rivers Ocean Air Forest
Operations / production workers taking personal responsibility for noise, parking and respectful behaviour in the local area.	Applying company procedures Being aware of social and cultural issues	Company procedures and policy Issues that may affect the community Ways to implement social responsibility Cultural issues Antisocial behaviours	Social responsibility issues may include: Parking in designated areas Car pooling Parking away from the site and using shuttle buses Noise

Sustainability Practice			
Application	**Skills**	**Knowledge**	**Range**
			Respectful behaviour
Operations / production workers providing information to community members or being a point of contact for issues raised by local community	Communicating Listening Negotiating Explaining sustainability concepts and processes Analysing reports	Enterprise procedures and complaints mechanisms Sources of information about products, processes	Issues raised may include: Emissions Noise Managing waste Environmental management Staff parking and transport Truck routes

Examples	Source (title and URL)
The **Environmental Impact Assessment for the Gladstone LNG project** identifies how it will manage potential negative community impact, for example: Cultural heritage management plans (CHMPs) • CHMPs will be developed with relevant Aboriginal parties and aim to avoid harm to cultural heritage in the first instance and if that cannot be achieved then a harm minimisation approach will be adopted. • General mitigation measures to be adopted include avoiding items of state and local significance and the adoption of appropriate offset distances to avoid indirect impacts to items of heritage significance. Social management plan • The plan will allow Santos to mitigate negative social impacts, enhance positive impacts and update the management strategy as the project evolves. Santos will monitor social impacts associated with the project and work with local services and stakeholders to develop practical solutions. Unforeseen impacts will be identified through Santos' established	http://www.glng.com.au/Content.aspx?p=106

Examples	Source (title and URL)
consultation network and mitigated. • Santos will implement policies for local hiring and procurement of goods whenever possible to maximise local benefits. • Santos will implement a zero tolerance policy for anti-social behaviour and negative social interaction in order to discourage such behaviour from Santos employees and contractors while on their work rotation. • Alternative options to reduce road traffic are being explored including transporting the majority of the pipeline components from Gladstone to Moura by rail.	
Mitchell EcoEnterprise Park, Qld, is **100% self-sustaining and carbon neutral**. Development of the six factory site has addressed community impact issues by: • Retention of a 4-megalitre dam situated in the middle of the site and shaded by native flora and provides a home to a variety of wildlife and also serves as a recreation area for employees. • Pathways incorporated throughout the development, particularly around the existing dam. • Mini-bus service has commenced for Beenleigh and Eagleby residents who work in the Yatala Enterprise Area. • Barbecue and facilities overlooking the lake for onsite workers and their families during work hours and weekends.	http://yourdevelopment.org/casestudy/view/id/23

Possible useful unit/s of competency
BSBSMB408B Manage personal, family, cultural and business obligations
LMTFD2004B Work within an indigenous cultural framework
MSACMC610A Manage relationships with non-customer external organisations
MSS014002A Evaluate sustainability impact of a work or process area
MSS015018A Inform and educate organisation and community representatives on sustainability issues
MSS017006A Identify and improve sustainability interactions with the community
MSS025002A Assess the environmental risk or impact of a project activity or process
MSS025004A Provide environmental information to customers
MSS025008A Monitor and evaluate noise
RTD4802A Develop approaches to include cultural and human diversity

Compliance requirements

This area of application relates to managing compliance with the range of codes, standards, reporting schemes, incentive programs, subsidies and legislative requirements that are currently in place or proposed around sustainability issues. It is relevant to:

- Staying aware of current and changing legislative requirements, codes of practice and incentive schemes
- Making informed decisions about participating in voluntary schemes
- Implementing and updating policies and procedures
- Monitoring compliance performance

Please also refer to the following related areas of application - **Community impact, Emergency / incident response, Environmental monitoring, control and technology, Facility / building design and management, Governance and strategy, Measuring and reporting, Planning and procedures** and **Waste management.**

Keywords	Description
Assessment and accreditation	Various systems of standards and evaluations; may be voluntary or mandated.
Australian Packaging Covenant	The Australian Packaging Covenant sits under the National Waste Policy and is the voluntary component of a regulatory arrangement based on the principles of shared responsibility through product stewardship, between key stakeholders in the supply chain and all levels of government. The Covenant is designed to minimise environmental impacts arising from the disposal of used packaging, conserve resources through better design and production processes and facilitate the re-use and recycling of used packaging materials. The Sustainable Packaging Guidelines include the following design strategies: • Maximise water and energy efficiency • Minimise materials (source reduction) • Use recycled materials • Use renewable materials

Keywords	Description
	• Minimise risks associated with potentially toxic and hazardous materials • Use materials from responsible suppliers • Design for transport • Design for reuse • Design for recovery • Design for litter reduction • Design for consumer accessibility • Provide consumer information http://www.packagingcovenant.org.au/
Carbon Management Principles	The EPA Victoria's Carbon Management Principles are: • Measure – calculate your GHG (greenhouse-gas) emissions (direct and indirect) • Set objectives – eg set GHG emissions and/or energy reduction targets or aim to be carbon neutral • Avoid – identify how much can be avoided and how • Reduce (Modify-Recover) – identify how to change activities to reduce emissions • Switch (Renew-Exchange) – identify alternative energy sources that are less greenhouse intensive • Sequester – establish sequestration through biological sinks (afforestation) or artificial capture and storage systems • Assess – identify the residual GHG emission • Offset – decide whether to offset these See http://www.epa.vic.gov.au/climate-change/carbon-management/

Keywords	Description
Carbon offsets	One carbon offset is 1 tonne of CO_2-equivalent greenhouse gas not emitted or that has been absorbed. The carbon market in Australia is currently voluntary; enterprises may choose to offset greenhouse-gas (GHG) emissions. In some situations individuals can offset their GHG emissions, for example, when purchasing flights with Qantas.
Carbon permits	A fixed amount of greenhouse gases such as carbon dioxide that a company is permitted to emit into the earth's atmosphere. This is also known as an emissions permit. A central authority usually a government body sets a limit or cap on the amount of pollutant that can be emitted. The limit or cap is allocated or sold to companies in the form of emissions permits which represent the right to emit or discharge a specific volume of the specified pollutant. Companies are required to hold a number of permits or carbon credits equivalent to their emissions. The total number of permits cannot exceed the cap, limiting total emissions to that level. Companies that need to increase their emission permits must buy from those companies that require fewer permits. The transfer of permits is referred to as a trade. In effect, the buyer is paying a charge for polluting, whilst the seller is being rewarded for reduced emissions. Thus in theory those who can reduce emissions most cheaply will do so, achieving the pollution reduction at the lowest cost to society.
Carbon Pollution Reduction Scheme (CPRS)	The shelved CPRS legislation would have introduced a legally binding national emissions-trading scheme covering about 75% of emissions and compelling about 1000 entities to purchase credits for emissions.
Carbon price	At the time of writing (October 2010) the Federal Government has formed a Multi-Party Climate Change Committee to look at putting a price on carbon. The Committee is established on the basis that a carbon price is an economic reform that is required to reduce carbon pollution, to encourage investment in low emissions technologies and complement other measures including renewable

Keywords	Description
	energy and energy efficiency. The Committee will consider mechanisms for introducing a carbon price (including broad-based emissions trading scheme, a broad-based carbon levy, a hybrid of both, and economy-wide and sector-based approaches). It will consider issues such as coverage, international linking, implementation issues, assistance measures for households and businesses (including emissions-intensive trade-exposed businesses) and review provisions.
Carbon reduction targets	For example the Climate Change Act 2010 (Victoria)
Clean Development Mechanism (CDM)	Clean Development Mechanism (CDM) where the United Nations Framework Convention on Climate Change certifies carbon offsets in developing countries which can be bought by developed countries.
Climate Change Act 2010 (Victoria)	The Act: • Establishes the Victorian Government's 20% emissions reduction target in law • Gives the EPA power to regulate greenhouse gas emissions and ensures no new power stations using conventional brown coal technology are built in Victoria • A legal framework to encourage the reforestation of private and public land to create carbon sinks that can be a new source of income for landowners • Creates voluntary Climate Covenants for Government, community, industry and regional bodies to help them take the lead on climate change action • Embeds climate change impacts into a range of Government decisions • Enables the Climate Communities Program to further promote local action to tackle climate change • Requires a Climate Change Adaptation Plan to be developed every four years to prepare for the climate change impacts that cannot be avoided.

Keywords	Description
Emissions-Intensive Trade-Exposed Industries assistance program	The EITE industries such as iron and steel, aluminium, chemicals, cement, non-ferrous metals, metals processing and liquefied natural gas processing were to receive assistance under the Carbon Pollution Reduction Scheme (CPRS). The CPRS has been shelved until at least 2013.
Energy Efficiency Opportunities Act 2006 (Commonwealth)	Introduced in July 2006, participation in the program is mandatory for corporations using more than 0.5 petajoules (PJ) of energy per year. Corporations must use the program's assessment framework to assess their energy use and identify energy savings opportunities. www.energyefficiencyopportunities.gov.au
Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth)	The Act focuses on the protection of matters of national environmental significance, with the states and territories having responsibility for matters of state and local significance. It requires Government approval to undertake any projects, developments or other activities that may have a significant impact on the environment, indigenous heritage, historic places, biodiversity and other matters that are listed under the Act. www.environment.gov.au
Environmental Code of Practice for packaging	See Australian Packaging Covenant; the code forms part of the covenant.
Equal Opportunity for Women in the Workplace Act 1999 (Commonwealth)	The Act defines the requirements for enterprises to manage and report on their programs for equal opportunity for women. Programs require analysis of performance in areas such as recruitment, training & development, promotion, conditions of employment, harassment and reporting on activities designed to improve performance. www.eowa.gov.au/
Global Reporting Initiative (GRI)	The Global Reporting Initiative (GRI) is a multi stakeholder non-profit organisation that provides guidelines on reporting economic, environmental and social performance (sustainability performance). The guidelines are developed through a multi stakeholder consultative process

Keywords	Description
	involving representatives from all over the world. The GRI framework is steward for reporting performance on human rights, labour, environmental performance, anti corruption and other cooperate issues. As of 2009 more than 1500 organisations from sixty countries use these guidelines to produce their sustainability reports. http://www.globalreporting.org/ReportingFramework/G31Guidelines/
Greenhouse gas (GHG)	Greenhouse gases (GHG) refer to the six that are rated under the Kyoto Protocol as having Global Warming Potential (GWP): • Carbon dioxide (CO_2) • Methane (CH_4) • Nitrous oxide (N_20) • Hydroflourocarbons (HFCs) • Perfluorocarbons (PFCs) • Sulphur hexafluoride (SF_6) GHG emissions are reported as million tonnes of carbon dioxide equivalent (MtCO2-e) http://www.ageis.greenhouse.gov.au/Help/PublicTutorialGlossary.aspx#G
Greenhouse Gas Reduction Scheme (GGAS) (sic)(NSW)	The NSW Greenhouse Gas Reduction Scheme (GGAS) commenced on 1 January 2003. It is one of the first mandatory greenhouse gas emissions trading schemes in the world. GGAS aims to reduce greenhouse gas emissions associated with the production and use of electricity. It achieves this by using project-based activities to offset the production of greenhouse gas emissions. http://www.greenhousegas.nsw.gov.au/
ISO 14000 Set:2005 Environmental Management Standards set	The ISO 14000 family of standards addresses various aspects of environmental management in order to control and improve the environmental performance of an

Keywords	Description
	organisation as measured against objectives. The standards are voluntary. The family of standards includes: • ISO 1400 1 :2004 Environmental Management Systems (requirements) • ISO 14004:2004 Environmental Management Systems (guidelines) • ISO 14050:2009 Environmental management - Vocabulary • ISO 14040:2006 Environmental management - Life cycle assessment - Principles and framework • ISO 14064 and ISO 14065 standards for greenhouse gas accounting Other relevant issues such as labeling, performance evaluation, communication and auditing are covered by other ISO standards. http://www.iso.org/iso/iso_catalogue/management_and_leadership_standards/environmental_management.htm
Kyoto Protocol 2007	Australia's ratification came into effect March 11 2008. The Kyoto Protocol aims to reduce global greenhouse gas emissions. Australia's target is to limit GHG to 108% of the levels they were in 1990, meaning emissions must only account for an 8% increase from 1990 to 2012.
National Carbon Accounting System (NCAS)	A national accounting and forecasting system for greenhouse gas emissions from land based activities. Land based emissions (sources) and removals (sinks) of greenhouse gases form a major part of Australia's emissions profile. Land management such as soil preparation, fertilizer use, harvesting and burning all affect emissions of greenhouse gases.
National Carbon Offset Standard (NCOS)	From 1 July 2010 Australia has a National Carbon Offset Standard (NCOS) to encourage businesses to offset their greenhouse-gas emissions in the voluntary carbon market. It provides guidance a voluntary standard for businesses to use in becoming carbon neutral or developing carbon neutral products. It also includes guidance on calculating the carbon footprint of an organisation or product and

Keywords	Description
	product life cycle analysis for the purpose of achieving 'carbon neutrality'. Only emissions sources that are not counted towards Australia's Kyoto Protocol target are eligible to generate offsets under the NCOS – so it does not include renewable energy, energy efficiency and methane-flaring projects. http://www.climatechange.gov.au/government/initiatives/national-carbon-offset-standard.aspx
National Environment Protection Measure for Used Packaging Materials (NEPM)	The goal of the used packaging materials NEPM is to reduce environmental degradation arising from the disposal of used packaging and to conserve virgin materials through the encouragement of reuse and recycling of used packaging materials by supporting and complementing the voluntary strategies in the Australian Packaging Covenant.
National Greenhouse Accounts	A national accounting and forecasting system for greenhouse gas emissions. It comprises a set of reports including the National Greenhouse Gas Inventory.
National Greenhouse Accounts Factors	Used to work out greenhouse gas emissions from fuel type used – natural gas, electricity, coal, petroleum products, bagasse, diesel and petrol. Part of the Energy Efficiency Opportunities Act.
National Greenhouse and Energy Reporting Scheme (NGERS)	The national reporting framework for information related to the greenhouse gas emissions, and energy production and use for corporations operating in Australia. It defines mandatory reporting for businesses that produce emissions above defined thresholds, covering energy consumption and production, greenhouse gas emissions, intensity indicators, energy audits, action plans, energy savings, greenhouse gas reductions, and projections.
National Greenhouse Gas Inventory	The inventory compiles and reports on data on Australia's greenhouse gas emissions. It forms part of the National Greenhouse Accounts and is transitioning to rely more on the National Greenhouse and Energy Reporting data.
National Pollutant Inventory reporting requirements (NPI)	Businesses have to report on their emissions and waste transfers, if they trip the reporting thresholds for 93 substances, rates of burning waste / fuel and the rate

Keywords	Description
	and type of electricity usage. A series of Emission Estimation Technique (EET) manuals have been developed for each reporting industry. These outline the industry processes and approaches for estimating emissions. The full list of manuals is available on the NPI website at: http://www.npi.gov.au The aim of the program is to: • Maintain and improve air and water quality • Minimise environmental impact associated with hazardous waste • Improve the sustainable use of resources
National Waste Policy: Less waste more resources	The policy includes a range of strategies including the Australian Packaging Covenant and proposed national product stewardship legislation. www.environment.gov.au
NSW Energy Savings Action Plans (ESAPs)	Legislated in May 2005. High energy users and local councils in NSW must prepare ESAPs which involves determining current energy use, undertaking a management review and detailed technical review to assess and identify savings measures. All organisations required to prepare ESAPs were published in Oct 2005 in the NSW Government Gazette and include: • Businesses in NSW using more than 10 gigawatt hours per year at site • All local councils in NSW with populations of more than 50,000 people • NSW Government agencies which use more than 10 gigawatt hours per year at site.

Keywords	Description
NSW Water Savings Action Plans (WSAPs)	Legislation introduced in May 2005 requires high water users in NSW to submit a Water Saving Action Plan (WSAP). WSAPs involve determining current water use, undertaking a managing review and a detailed technical review assessing and evaluating savings measures. Organisations required to prepare WSAPs were published as a Water Savings Order in the NSW Government Gazette in Oct 2008 and included: • Businesses in Sydney water area of operations using more than 50 million litres of water per year • All local councils in Sydney Water area • NSW government agencies using at least 50 million litres of water per year
Occupational health, safety and environment systems (OHS, SHE etc)	Development, review and application of policies and procedures in health, safety and environment which often align to aspects of sustainability.
Offsetting residual greenhouse emissions	See **carbon offsets**
Renewable Energy Certificates (RECs)	Tradeable Renewable Energy Certificates (RECs) are created on the basis of eligible renewable energy generation with each REC equivalent to one megawatt hour (MWH) of renewable generation. A range of energy sources and technologies are available including: Hydro, Wind, Solar and various biomass sources with provision for emerging technologies not yet commercialised in Australia, such as wave, tidal and geothermal energy.
Renewable Energy Target (RET) 20%	Legislated in August 2009 the R.E.T. is designed to ensure that 20% of Australia's electricity supply will come from renewable energy sources by 2020. By 2020 electricity produced by sources such as solar, wind and geothermal will calculate to around the same as all of Australia's current household use.
Sustainability Covenant	Sustainability Covenants have been introduced as a tool for dialogue and

Keywords	Description
	cooperation between government agencies and business in reducing the environmental impacts of products and services through the entire life cycle. They can be undertaken by individual enterprises, a supply chain, industry association or industry sector. Currently the EPA Victoria appears to be the primary government agency working with sustainability covenants. Benefits for businesses include: • Improve long term sustainability • Increase profitability • Reduce potential for restrictions imposed by regulation • Opportunity for competitive advantage through product and service differentiation • Potential assistance in overcoming environmentally based trade barriers • Statutory recognition of environmental leadership.
The Australian Ecolabel Program	The Australian Ecolabel Program, managed by Good Environmental Choice Australia (GECA) is based on the international standard ISO 14024: "Environmental Labels and Declarations - Guiding Principles" which requires environmental labeling specifications to include criteria that are objective, reasonable and verifiable. The program has developed a number of voluntary standards for 'environmentally preferable products', based on a life cycle assessment approach to environmental performance measures. Standards include: • Architectural and protective coatings • Carpets • Detergents • Furniture and fittings • Recycled plastic and rubber products GECA also provides a green procurement database and runs green procurement

Keywords	Description
	training. Good Environmental Choice Services (GECS) trading as Environmental Assurance is the auditing and certification body with responsibility for product assessment, certification and licensing of products against the GECA standards. http://www.geca.org.au/
Triple Bottom Line Reporting	Triple Bottom Line - abbreviated to TBL or 3BL - is also known as "people, planet, profit" or the "Three Pillars." It captures values and criteria for measuring an organisation's economic, ecological and social success.
United Nations Framework Convention on Climate Change (UNFCCC)	UNFCCC is an international environmental treaty to stabilize greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. The treaty itself sets no mandatory limits on GHG emissions and contains no enforcement mechanisms. Instead, the treaty provides updates, called protocols, that set mandatory emissions limits. One of these is the Kyoto Protocol, now better known than the UNFCCC itself.

Sustainability Practice

Application	Skills	Knowledge	Range
Managers complying with sustainability regulations and standards	Developing and reviewing systems Assessing and accrediting Developing and reviewing OHSE systems Rehabilitating the environment Mitigating environmental effects	Climate change United Nations Framework Convention on Climate Change Awareness of environmental impact of decisions Fees and fines for non conformance Ecological systems	Shelf life requirements Environmental impact statements Legislation may include: AS / NZ ISO 14000Set:2005 Environmental Management Standards set Energy Efficiency Opportunities Act

Sustainability Practice

Application	Skills	Knowledge	Range
		Environmental science Legislation and regulations	(2006) National Greenhouse and Energy Reporting Act (2007) Climate Change Act 2010 (Victoria)
Supervisors and managers with a role in meeting reporting requirements	Analysing lifecycles Measuring and reporting carbon footprint Measuring and reporting greenhouse gases Measuring and reporting energy use Writing reports Researching reporting requirements	Greenhouse gas emissions Carbon footprint Greenhouse gas emissions National Greenhouse Accounts (NGA) factors Energy use (by fuel type) – reported in GJ Energy use per unit of output Assessed energy – reported in GJ Net financial benefits – reported in $ Identified energy savings opportunities (by fuel type) – reported in GJ Business response category (by fuel type) – reported in GJ and as numbers of opportunities Payback period Reporting accuracy	National Greenhouse and Energy Reporting Scheme Global Reporting Initiative Triple Bottom Line Reporting Kyoto Protocol 2007 National Pollutant Inventory Energy assessment outcomes and business response National Greenhouse Gas Inventory
Environmental managers identifying and implementing incentive schemes	Researching Evaluating compliance Developing and implementing policy and	Carbon capture and storage Carbon credits	Australian Packaging Covenant Carbon credits Carbon permits

Sustainability Practice			
Application	**Skills**	**Knowledge**	**Range**
	procedures Evaluating different types of carbon offsets Ensuring offsets comply with Government regulations	Carbon permits Renewable Energy Certificates Renewable Energy Target (RET) 20% Offsetting residual greenhouse emissions National Carbon Offset Standard (NCOS)	Carbon Pollution Reduction Scheme Clean Development Mechanism Energy Efficiency Opportunities Environmental Code of Practice for packaging Greenhouse Gas Abatement Scheme National Environment Protection Measure for Used Packaging Materials Renewable Energy Target Sustainability covenant (VIC govt, AiG and EPA) waterMAP Assist program

Examples	Source (title and URL)
Ford Australia assessed its Broadmeadows Paint Shop, finding **potential energy savings** of 0.12 PJ, 30 percent of energy use. Included the introduction of an energy saving mode for the paint shop air-supply system during non-production periods, reducing the pressure losses upstream from the air replacement plants, recovery of air compressor waste heat to heat the paint mix room, and automotive process oven optimisation.	First Opportunities A look at results from 2006-2008. For the Energy Efficiency Opportunities Program at www.energyefficiencyopportunities.gov.au
BHP Billiton's sustainability framework outlines six key focus areas: • Management • Health and safety	http://bhpbilliton.com/bb/sustainableDevelopment.jsp

Examples	Source (title and URL)
• Environment • Climate change and energy • Community relations • Human rights Their Sustainability Report 2010 outlines strategies, targets and performance against sustainability indicators such as: • Workforce diversity and employee relations • Community engagement and human rights • Resource consumption • Strategies for issues associated with climate change	
Orica Sustainability Report 2010 covers social, economic and environmental sustainability. It outlines Orica's targets and performance in sustainability indicators such as: • Community complaints • Community engagement • Human rights • Labour practices • Product stewardship • Value chain The web site also provides a range of case studies on sustainability initiatives.	www.orica.com/sustainability

Possible useful units of competency
AUM2001B Monitor and maintain a safe workplace and environment
AURC172003A Identify environmental regulations and best practice in a workplace or business
AURC472082A Plan and manage compliance with environmental regulations in a workplace or business
MSAENV272B Participate in environmentally sustainable work practices
MSAENV472B Implement and monitor environmentally sustainable work practices
MSAENV672B Develop workplace policy and procedures for environmental sustainability
MSS015006A Report to Global Reporting Initiative guidelines
MSS015007A Develop a business case for sustainability improvements
MSS015009A Implement sustainability plans
MSS015014A Develop response to sustainability related regulation
MSS024002A Implement environmental management plans and procedures
MSS024003A Apply an understanding of environmental principles to a site
MSS025003A Report environmental data
MSS025016A Perform sampling and testing of stationary emissions

Emergency / incident response

This area of application of sustainability is a significant issue relates to emergency and incident response due to the range of hazardous substances and dangerous goods that are used within the MSA sectors. This is especially so in sectors such as hydrocarbons processing where emergencies and hazards have an obvious and direct potential impact on the physical environment, the workforce and the local community. This area of application is relevant to:

- Systems and procedures such as 'prevent, prepare, respond, recover'
- Action to control / contain immediate effects
- Hazard assessment and risk management
- Emergency response and evacuation plans
- Safety of personnel, risks to the environment
- Communication systems, signs, alerts
- Training
- Monitoring and performance management

Please also refer to the following related areas of application - **Community impact, Compliance requirements, Environmental monitoring, control and technology, Governance and strategy, Measuring and reporting, Planning and procedures, Waste management** and **Workforce planning and workplace culture.**

Keywords	Description
Hazard signs	Hazard signs use standardised symbols designed to warn about hazardous materials or locations. The hazard symbols are defined by Standards Australia and use different colours, backgrounds, borders and supplemental information in order to signify the type of hazard.
Material Safety Data Sheets (MSDS)	A Material Safety Data Sheet (MSDS) is a document that describes the chemical and physical properties of a material and provides advice for its safe storage and handling use. It includes details of health and physiochemical hazards, exposure controls, personal protective equipment safe handling and storage instructions, emergency procedures and disposal advice. The responsibility to prepare an MSDS for a hazardous substance and or dangerous goods lies with the supplier, defined as a manufacturer or importer. MSDS do not have to be formally approved; however the OHS authority in each State or Territory

Keywords	Description
	is responsible for determining whether an MSDS complies with relevant legislation or regulations.
Personal Protective Equipment (PPE)	PPE can protect from injury or make the injury less severe. PPE is often mandatory. Examples include: • Overalls / coveralls – protecting arms, body and legs and preventing lose garments being caught in moving equipment or protruding parts. Easily removed if contaminated and usually in high visibility colours and with fire retardant in the fabric • Safety boots / shoes – protect from dropped objects, heat and slips • Hard hats • Safety goggles • Gloves

Sustainability Practice

Application	Skills	Knowledge	Range
HSE officers ensuring responses to incidents and emergencies incorporate consideration of sustainability	Identifying environmental hazards Managing hazards Recognising emergencies Using Personal Protective Equipment Understanding emergency signals Using Material Safety Data Sheets (MSDS) Examining incident scenes	Environmental consequences of different hazard management methods Workplace documentation and recording systems Company policies Measures for reducing impact on the environment	Environmental consequences may include: Discharge into waterways and air Pollution Toxic gases and smoke

Sustainability Practice

Application	Skills	Knowledge	Range
Yard operator responsible for ensuring that water used to douse a burning truck does not go down the drain	Identify environmental hazards Hazard management Selecting first response equipment Identifying the type of incident Identifying and responding to problems	Environmental consequences of difference hazard management methods Classification of fires and incidents Workplace procedures	Facility may have bunds, ways to block drains, equipment to collect waste water

Examples	Source (title and URL)
The Orica Emergency Response Service **assesses risks** associated with emergency situations and provides instructions and guidelines including environmental protection.	Emergency Response Service – Orica www.orica.com/sustainability/?page=87

Possible useful units of competency

MSACMG707A Respond to a major non-conformance
MSAPMOHS205A Control minor incidents
MSAPMOHS401A Assess risk
MSL944001A Maintain laboratory / field workplace safety
MSS027012A Implement and maintain the site OHS management system
PMAOHS310B Investigate incidents
PMAOHS311B Lead emergency teams

Environmental monitoring, control and technology

This area of application relates to using technology to monitor and control environmental sustainability and is relevant to:

- Developing methods to monitor and control the use of energy and water and production of waste
- Contributing to the development of environmental impact statements
- Conducting energy efficiency assessments
- Development and implementation of testing processes
- Data collection and analysis

Please also refer to the following related areas of application – **Compliance requirements, Governance and strategy, Measuring and reporting, Planning and procedures,** and **Waste management.**

Keywords	Description
Audit	An audit is an evaluation of a person, organisation, system, process, enterprise, project or product. The term often refers to audits in accounting but can be applied in areas such as project management, quality management and energy conservation.
Ecological footprint	Ecological footprint is a measure of human demand on the earth's ecosystems. It represents the amount of biologically productive land and sea area needed to: • regenerate the resources a human population consumes and • absorb and render harmless the corresponding waste. Using this assessment it is possible to estimate how much of the earth' resources (or how many planet earths) it would take to support humanity according to the assessment parameters.
Ecological systems	Refers to the combined physical and biological components of an environment. An ecosystem consists of all the organisms living in a particular area and everything they interact with, such as rocks, air, soil, water and sunlight.
Emissions	Emission of air pollutants often refers to greenhouse gases (see **Greenhouse gas**)

Keywords	Description
	but also includes: • particulates from burning of waste, minerals processing, exhaust • chemicals and toxic substances released from factories, mining and processing, power plants. Ninety three toxic emissions are monitored through the National Pollutant Inventory reporting requirements. http://www.npi.gov.au/
Environmental impact statements	An environmental impact statement or assessment (EIA) is document stating the possible positive or negative impact that a proposed project may have on the environment, looking at the natural, social and economic aspects. The International Association for Impact Assessment (IAIA) defines an environmental impact assessment as the process of identifying, predicting, evaluating and mitigating the biophysical, social and other relevant effects of development proposal prior to major decisions being taken and commitments made.
Environmental mitigation / mitigation banking	Environmental mitigation generally refers to actions taken to lessen harmful impacts. In the context of environmental impacts, mitigation includes actions taken to avoid, reduce, or compensate for the effects of (direct or indirect) environmental damage. For example, mitigation of global warming refers to the actions taken by individuals or corporations to reduce greenhouse gas emissions in order to minimise their effects on global climate change. Mitigation banking is a system where third party 'banks' manage the restoration / preservation of defined areas and sell credits to businesses as an offset to adverse impacts they may generate.
Hydrography	Hydrography focuses on measurement of the depth and any physical characteristics of waters and marginal land. Specifically refers to measurements and descriptions of navigatable waters necessary for the safe navigation of vessels.

Keywords	Description
	Oceanography and limnology are subjects of hydrography.

Sustainability Practice

Application	Skills	Knowledge	Range
Production supervisors monitoring efficiency, rework and waste reduction to ensure efficient and effective use of existing resources and equipment	Using competitive manufacturing tools and techniques Monitoring physical / mechanical condition Collecting and analysing data Analysing cost / benefit Solving problems Analysing root cause Mapping processes	Sustainability goals of the enterprise Environmental sensitivities Environmental impacts of materials and energy used and emitted Mitigation strategies Sustainability issues	Any process in a manufacturing value chain Reworking faulty products Minimizing use of chemicals Sorting waste for recycling Turning off lights in unused rooms
Sustainability auditors conducting an energy efficiency assessment	Testing and measuring use of energy Choosing methods of testing and analysis Auditing Collecting and analysing data to calculate the use of energy Sampling and testing Identifying sources and uses of energy	How energy is consumed, transformed and lost Types of energy Energy balancing Nature of energy wastage Waste reduction strategies	Applies to organisations and their value chains Energy may be; Alternative Renewable Sustainable Co-generated Peak Off peak

Examples	Source (title and URL)
After the Montara oil and gas spill into the Timor sea in 2009. The Australian Government and PTTEP Australia developed a long term **environmental monitoring program**.	Montara oil spill www.environment.gov.au/coasts/oilspill/html#monitoringstudies

Possible useful units of competency
MSS014002A Evaluate sustainability impact of a work or process area
MSS015010A Conduct a sustainability water audit
MSS015011A Conduct a sustainability energy audit
MSS015012A Conduct an emissions audit
MSS024002A Implement environmental management plans and procedures
MSS025002A Assess the environmental risk or impact of a project activity or process
MSS025003A Report environmental data
MSS025008A Monitor and evaluate noise
MSS027002A Apply environmental legislation, codes and standards

Facility / building design and management

This area of application refers to 'big picture' building and facility management issues that are generally outside day to day operational activities and is relevant to:

- Operators and supervisors contributing ideas for improvements that can be taken on board by design, maintenance and management teams
- Designing new facilities or refurbishments for increased sustainability
- Managing existing buildings and plant for increased sustainability
- Auditing and managing the use of water and energy and the amount of waste produced

Please also refer to the following related areas of application - **Community impact, Compliance requirements, Environmental monitoring, control and technology, Governance and strategy, Measuring and reporting, Planning and procedures, Supply chain** and **Waste management.**

Keywords	Description
Asset life cycle planning	Asset life cycle planning (ALCP) is the process of determining the sum of all costs associated with the asset during its life. The key is developing a comprehensive understanding of the asset's operating costs, maintenance costs and life expectancy.
Facility energy / waste / water audits	See **audit** keyword
Facility management planning	Facility management is primarily devoted to the maintenance and care of institutional or commercial buildings. The aim is to ensure functionality of the built environment by integrating people, place, process and technology.
Heat /energy loss	Heat /energy loss could be from plant and equipment, buildings, HVAC
Space / storage requirements	Space / storage requirements could be for inventory, supplies, equipment
Travel / transport / movement	Travel / transport / movement might relate to people, product, materials

Sustainability Practice

Application	Skills	Knowledge	Range
Managers and engineers designing and renovating buildings and facilities	Using competitive manufacturing tools and techniques Designing new, or refurbishing existing, facilities Sourcing 'cleaner' capital equipment Researching incentives	National Australian Building Environmental Rating Scheme (NABERS) Energy performance rating Government incentives and programs	Sustainability issues when renovating facilities may include: Passive solar principles for building orientation and design Insulation Energy sources; renewable, sustainable alternative, cogeneration Travel / transport / movement of supplies and products Space / storage Water collection from roofs Rainwater harvesting Efficient fixtures
Managers / supervisors minimising resource use and waste in buildings and facilities	Using competitive manufacturing tools and techniques Auditing Measuring and calculating	Strategies and tools to minimise: Energy and water use space / storage requirements travel / transport / movement waste	Sustainability issues when to consider when minimising resource use and waste may include: Increasing efficiency of use of energy and water Alternatives for resources Travel / transport / movement Storage systems Recycling of waste Minimising waste

Sustainability Practice			
Application	**Skills**	**Knowledge**	**Range**
Supervisors ensuring that procedures to implement facility management plans are carried out	Using competitive manufacturing tools and techniques Auditing Measuring and calculating	Management plan Sustainability issues and factors Company policies and procedures	Could include old or new facilities

Example	Source (title and URL)
Oxford Cold Storage uses 200 kilolitres of water every day for their evaporative cooling systems. With concerns about long term water supply and threat of price increases they applied for funding (from AIG) for a feasibility study to ascertain how water could be sourced from roofs and plant buildings. The study showed that 62% of potable water needs could be met by **capturing water** from the two roof areas (based on average yearly rainfall) saving almost $26,000 in annual water costs in addition to the benefits for the environment. Cost of implementation was estimated at $600,000 with initial payback period of 23 years; primarily: • Installation of 28 tanks • New pipe works • Configuration of existing pipes • Centralised computer control of valves They received a $300,000 grant from City West Water and the Dept of Innovation, Industry and Regional Development making the project economically viable.	Oxford Cold Storage case study http://www.aigroup.com.au/environment/casestudies/

Example	Source (title and URL)
ABnote identified several strategies to support sustainability in their facility design and management, providing **energy and water savings** of up to $22,000 at one plant. These included: • Ensuring that evaporative air conditioning units are working properly • Installing water-efficient fixtures in new plants • Sensor systems for lighting and environmental controls • Upgrading toilets to duel flush • Installing rainwater tanks installed for non-drinking water use • 'Green teams' doing audits to ensure equipment (office and plant) is turned off when not in use	ABnote case study http://www.aigroup.com.au/environment/casestudies/
When Alcoa Fastening Systems Australia moved to a new plant they incorporated the challenge of capturing **sustainable building design principles** to optimise environmental performance into their relocation. With the goal of actively reducing their ecological footprint a priority they developed the design with additional features including: • Roof insulation • Rain water tank • Arid landscape that would not require water • Exhaust fans to the roof • Raising the computer room floor for cooling • Toilet flushing using rain water tank • TS21 high performance glazing to the warehouse for improved day lighting • High grade carpet to provide better insulation in office areas.	Alcoa Fastening Systems case study http://www.aigroup.com.au/environment/casestudies/

Example	Source (title and URL)
Woolworths logistics division has implemented a range of **energy efficiency measures** across major distribution centres, to include: • Upgrade of building management systems • High bay lighting control • Energy efficient lighting fixture upgrade • Installation of smart lighting controls • Optimisation of heating ventilation and air conditioning (HVAC) operating hours.	Woolworths Limited Distribution centres First Opportunities A look at results from 2006-2008. For the Energy Efficiency Opportunities Program www.energyefficiencyopportunities.gov.au

Possible useful units of competency
ESB801A Research and apply principles of sustainable building
ESB802A Research and recommend sustainable water use in buildings
MSACMT670A Develop and manage sustainable energy practices
MSS014005A Apply proactive maintenance strategies to sustainability
MSS015010A Conduct a sustainable water use audit
MSS015011A Conduct a sustainability energy audit
MSS015012A Conduct an emissions audit
MSS017002A Determine process loss through mass or energy balancing
MSS017007A Design for sustainability

Possible useful units of competency
MSS025002A Assess the environmental risk or impact of a project activity or process
MSS025016A Perform sampling and testing of stationary emissions

Governance & strategy

This area of application relates to good governance and strategic planning at senior management and Board of Director levels and is relevant to:

- Ensuring regulatory requirements for reporting are met
- Incorporation of sustainability principles into strategic planning
- Providing leadership and modelling ethical practices
- Culture change

Please also refer to the following related areas of application – **Community impact, Compliance requirements, Measuring and reporting, Planning and procedures, Waste management** and **Workforce planning and workplace culture**.

Keywords	Description
Access and Equity	Access and equity refers to activities that aim to eliminate or reduce potential discrimination and/or provide more equitable opportunities for example by: • Addressing barriers to accessing information, services, employment • Providing or improving opportunities for genuine participation • Inclusion in consultation about decision making • Promoting fairness in the distribution of resources, particularly for those most in need • Ensuring equitable allocation of job promotions • Recognising peoples rights
Anti-discrimination	The following laws operate at a federal level to protect people from discrimination and harassment; Australian Human Rights Commission has statutory responsibilities under them: • Age Discrimination Act 2004 • Australian Human Rights Commission Act 1986 • Disability Discrimination Act 1992

Keywords	Description
	• Racial Discrimination Act 1975 • Sex Discrimination Act 1984 Discrimination results where someone is treated differently or unfairly due to a perceived characteristic such as: • Religion • Ethnicity • Sexuality • Gender • Political beliefs • Disability
Change management	Change management is a structured approach to shifting / transitioning individuals, teams or organisations from a current state to a desired state. It is an organisational process that aims to empower employees to accept changes in the current work environment. In project management it refers to a formal process for approving changes to scope.
Consumer law	Consumer law is an area of law that regulates private law relationships between individual consumers and the businesses that provide the goods and services. Consumer protection covers a wide range of topics including but not limited to: • Product liability • Privacy rights • Unfair business practices • Fraud Consumer laws are designed to ensure fair trade competition and the free flow of truthful information in the marketplace.

Keywords	Description
Co-operative work practices / worker cooperatives	Worker cooperatives have the objective of creating and maintaining sustainable jobs and generating wealth to improve the quality of life of the worker members, dignify human work, allow workers democratic self management and promote community and local development. The internals regulation is formally defined by regimes that are democratically agreed on ad accepted by the worker members. As a general rule work is carried out by members.
Corporate citizenship	A debatable term usually meaning one of two things: • A company's role in or responsibilities towards society • A company as a citizen within the territory's legal jurisdiction, ie an artificial citizen with the legal rights of a natural person
Duty of Care	A legal obligation imposed on an individual requiring they adhere to a standard of reasonable care performing any acts that could foreseeably harm others. In the workplace for example an obligation of all participants to ensure the health and safety of all persons. The employer owes a duty of care to provide a safe workplace for workers.
Environmental purchasing policy / eco-buy	Environmental purchasing is the inclusion of environmental factors in decisions on the purchase of products and / or services. The aim of considering environmental factors is to buy products or services that have less impact on the environment and human health than otherwise comparable products or services.
Equal opportunity	Equal opportunity (EO) in a workplace means all employees have equal access to opportunities available at work, all employees will be treated equally and with fairness and respect in that they are not subject to discrimination or harassment at the workplace. EO is an outcome not just a process.
Equal Opportunity for Women in the Workplace Act (EWOA) (1999)	The EWO Act covers all private sector organisations including companies, sole traders and incorporated associations that employ 100 or more employees in Australia. The Act requires development and implementation of workplace

Keywords	Description

	programs dealing with the promotion of EO for women in the workplace. An annual report must be submitted which includes:
	• Organisational profile (occupations, gender)
	• Identified problems for women in your workplace
	• Effectiveness, improvements and priorities in areas such as:
	  • Recruitment and selection
	  • Promotion, transfer and termination
	  • Training and development
	  • Work organisation
	  • Conditions of service
	  • Arrangements for dealing with sexual harassment, pregnancy, breastfeeding.
	www.eowa.gov.au/

Ethical practice	Transparency of political dealings and relationships, lobbying and public policy involvement Anti-corruption / ethical practice policies and procedures, training, monitoring and complaints
Fair trade	Fair Trade is an organised social movement and market based approach that aims to help producers in developing make better trading conditions and promote sustainability. The informal association is a trading partnership based on dialogue, transparency and respect that seeks greater equity in international trade. It aims to provide higher wages than typically paid as well as helping producers to develop knowledge and skill resources to improve their lives.
Human capital	Human capital refers to the stock of competencies, knowledge and personality attributes embodied in the ability to perform labour that produces economic value.

Keywords	Description
Human rights	The basic rights and freedoms to which all humans are entitled. Often held to include the right to life and liberty, freedom of thought and expression and equality before the law. A significant human rights issue for the manufacturing sectors is child exploitation. Child labour is a crime committed against 246 million children around the world or one in every seven children aged between 5 and 17. They are predominantly in the following industries: • 70% in agriculture, fishing, commercial hunting and forestry • 8% in manufacturing • 8% in wholesale and retail trade, restaurants and hotels • 7% in community, social and personal service, such as domestic work.
Indigenous Land Use Agreements (ILUA)	A voluntary agreement about the use and management of an area of land or waters where native title exists or might exist. The agreement is made between one or more native title groups and others (such as miners, pastoralists or governments). A registered ILUA is legally binding on the people who are parties to the agreement as well as all native title holders for that area. An indigenous land use agreement is an agreement negotiated between a native title group and others, such as businesses or governments, about the use and management of land and waters. An indigenous land use agreement can be negotiated over areas where native title has, or has not yet, been determined to exist. They can be part of a native title determination, or settled separately from a native title claim. Indigenous land use agreements can be formed on the following topics: • native title holders agreeing to a future development • how native title rights coexist with the rights of other people • access to an area

Keywords	Description
	• extinguishment of native title • compensation.
Inter and intra generational equity	Inter-generational equity has to do with fairness between current and future members of a community. Intra-generational equity – justice among the present population.
Inter regional and inter country equity	Equity and fairness between regions and between countries.
Labour rights and work conditions	Labour rights or worker rights are a group of legal rights and claimed human rights referring to relations between workers and their employers. Usually relate to negotiating workers pay, benefits and safe working conditions; a central right is the right to unionise.
Occupational health, safety and environment systems (OHS, SHE etc)	Development, review and application of policies and procedures in health, safety and environment which often align to aspects of sustainability.
Precautionary principle	The principle implies that there is a social responsibility to protect the public from exposure to harm; the burden of proof that it is *not* harmful falls on those taking the action
Social capital	Social Capital is an evolving concept that relates to social norms and networks that facilitate collective action within groups. It encompasses institutions, relationships and customs that shape the quality and quantity of society's social interactions. Social Capital, when enhanced in a positive manner, can improve project effectiveness and sustainability by building the community's capacity to work together to address their common needs, fostering greater inclusion and cohesion, increasing transparency and accountability.

Keywords	Description
Strategy development	Strategy development is fundamental to creating and running a business. It broadly refers to setting specific goals and objectives, which may fluctuate in response to shifting market dynamics, and selecting the preferred activities from a range of alternatives designed to achieve the goals.
Trade practices	The ACCC is responsible for administering the federal Trade Practices Act (1974). The Act provides protection for small businesses and consumers and prevents some restrictive trade practices of companies including: • Market activities that manipulate supply or demand • Price fixing • Market sharing deals • Misleading or deceptive conduct • False representation • Bait advertising – eg advertising exceptional deals that do not exist • Accepting payment without intending to supply • Pyramid selling – eg exchange of money to enrol others in a scheme with no actual delivery of product
Triple Bottom Line Reporting	Triple Bottom Line - abbreviated to TBL or 3BL - is also known as “people, planet, profit” or the “Three Pillars.” It captures an expanded spectrum of values and criteria for measuring an organisation’s economic, ecological and social success.

Sustainability Practice			
Application	**Skills**	**Knowledge**	**Range**
Senior managers reporting on the triple bottom line to boards, Government, shareholders and the community	Negotiating data collection procedures Managing projects Writing reports Analysing data	Triple bottom line reporting requirements Commercial reporting requirements Internal and external data sources Sustainability impact of products and processes	Dependent on industry sector, type and size of organisation
Board / management taking sustainability into account in strategic planning		Legislative and regulatory requirements Government incentives Sustainability strategies	
Board / management committing to social sustainability strategies	Monitoring the community and employees for issues Communicating with stakeholders Preparing responses Analysing and solving problems	Principles of sustainability Possible responses to improve sustainability	Can apply to customers, employees or the community

Example	Source (title and URL)
Leadership – BHP Billiton has used an internal Energy Excellence program to integrate energy efficiency into their business operations. It reported the second largest overall savings identified of 7.4 PJ The company identified opportunities across a range of sites, identifying 6 PJ of savings at its Worsley Alumina site alone.	First Opportunities A look at results from 2006-2008. For the Energy Efficiency Opportunities Program www.energyefficiencyopportunities.gov.au

Possible useful units of competency
AURC172003A Identify environmental regulations and best practice in a workplace or business
AURC472082A Plan and manage compliance with environmental regulations in a workplace or business
BSB803A Manage business strategy
MSACMG803A Develop models of future state manufacturing practice
MSACMT670A Develop and manage sustainable energy practices
MSAENV672B Develop workplace policy and procedures for environmental sustainability
MSS015005A Develop required sustainability reports
MSS015006A Report to Global Reporting Initiative guidelines
MSS015007A Develop a business case for sustainability improvements
MSS015008A Develop strategic sustainability plans
MSS015009A Implement sustainability plans
MSS015014A Develop response to sustainability related regulation
MSS015017A Develop regulated sustainability reports
MSS017001A Analyse and determine organisational risk areas for sustainability
MSS017003A Identify and respond to external sustainability factors for an organisations
MSS017004A Lead sustainability strategy deployment
MSS017005A Manage a major sustainability non-conformance

Possible useful units of competency
MSS017006A Identify and improve sustainability interactions with the community
MSS027001A Coordinate environmental management activities
MSS027004A Contribute to environmental decision making

Measuring and reporting

This area of application relates to the competencies required to measure and report on sustainability and is relevant to:

- Measuring and reporting on carbon use and equivalence
- Monitoring the use of energy, water and other physical resources
- Measuring and reporting on the reduction of waste
- Measuring improvements to sustainable practices
- Checking that claims of sustainability can be substantiated

Please also refer to the following related areas of application – **Compliance requirements, Environmental monitoring, control and technology, Governance and strategy, Planning and procedures, Process improvement, Product improvement and life cycle, Supply chain** and **Waste management**.

Keywords	Description
Abnormal emissions, discharges and airborne contaminants	For example noise, light, solids, liquids, water / waste / water, gases, smoke, vapour, fumes, odours, particulates, radioactivity.
Carbon capture and storage	See **carbon sequestration** keyword
Carbon credits	A carbon credit is a generic term for any tradable certificate or permit representing the right to emit one tonne of carbon dioxide or carbon dioxide equivalent (CO2-e). The carbon credit system was ratified in conjunction with the Kyoto Protocol. Its goal is to stop the increase of carbon dioxide emissions. The goal is to allow market mechanisms to drive industrial and commercial processes in the direction of low emissions or less carbon intensive approaches than those used when there is no cost to emitting carbon dioxide and other greenhouse gases into the atmosphere. Carbon credits can be traded in the international market at their current market price.
Carbon equivalent	The long-lived greenhouse gasses all have different average lifetimes and effectiveness at trapping infrared radiation (heat). To combine the different warming effects of the various gases, a unit called carbon dioxide equivalents (CO2-e) is used to convert masses of each gas to a mass of CO2 that would give the equivalent warming, generally over a

Keywords	Description
	100 year timeframe. So for example, over 100 years, per mass, methane is 21 times stronger as a greenhouse gas, nitrous oxide is 310 times stronger, and typical halocarbons are many thousands of times stronger. This is why comparatively small releases of non CO_2 gases become significant in warming terms.
Carbon footprint	Carbon footprint is the total set of GHG emissions caused by an organisation, event, product or person expressed in terms of the amount of carbon dioxide or its equivalent of other GHGs emitted. An individual, nation or organisation's carbon footprint can be measured by undertaking a GHG emissions assessment. Once the size of the carbon footprint is known a strategy can be devised to reduce it eg by technological developments, better process and production management, changing to Green Procurement, carbon capture and consumption strategies.
Carbon trading / emissions trading	Carbon emission trading is a form of emissions trading that specifically targets carbon dioxide (calculated in tonnes of carbon dioxide equivalent). It currently constitutes the bulk of emissions trading and is commonly used by countries to meet obligations specified by the Kyoto Protocol, namely the reduction of carbon emissions to mitigate future climate change.
Embedded carbon / embodied carbon	An item's carbon content is the total amount of carbon dioxide emitted from every stage of its production and distribution from source to store. This is also known as embedded carbon. The total of carbon consumed in the manufacture, use and disposal of the product expressed as CO_2 equivalent tonnes.
Emissions	Emission of air pollutants, usually referring to greenhouse gases (see **Greenhouse gas** keyword) but also includes: • particulates from burning of waste, minerals processing, exhaust • chemicals and toxic substances released from factories, mining and processing,

Keywords	Description
	power plants. Ninety three toxic emissions are monitored through the National Pollutant Inventory reporting requirements.
Energy balancing	Energy balancing, also referred to as energy accounting, is used to track energy through a system or process. It can be used to determine resource use and environmental impacts by measuring energy in, energy out, non-useful energy versus work done, and transformations within the system.
Energy Savings Action Plans	NSW Government introduced legislation in May 2005 requiring high energy users and local councils in NSW to prepare Energy Savings Action Plans; includes businesses in NSW using more than 10 gigawatt-hours per year at a site and a list of designated energy users
Ensuring "green" claims can be substantiated	Self explanatory
Global Reporting Initiative (GRI)	The Global Reporting Initiative (GRI) is a multi stakeholder non-profit organisation that provides guidelines on reporting economic, environmental and social performance (sustainability performance) The guidelines are developed through a multi stakeholder consultative process involving representatives from all over the world. GRI framework is steward for reporting performance on human rights, labour, environmental performance, anti corruption and other cooperate issues. As of 2009 more than 1500 organisations from sixty countries use these guidelines to produce their sustainability reports.
Mass balancing / materials balancing	A mass balance (also called a material balance) is an application of conservation of mass to the analysis of physical systems.
Measurement and calculation	Application of basic through to advanced measurement and calculation for example energy / water consumption, emissions, carbon equivalence.
Measuring the point of obligation of emissions	Depends on legislation regarding a price for carbon

Keywords	Description
National Greenhouse and Energy Reporting System (NGERS)	The national reporting framework for information related to the greenhouse gas emissions, and energy production and use of corporations operating in Australia.
Renewable vs non renewable energy	Sun, wind, water and geothermal are renewable (self sustainable) energy sources. However they can be expensive to harness and large amounts are required to produce small amounts of energy. Oil, natural gas and coal are non-renewable sources and are efficient as small amounts can produce relatively large amounts of energy.
Value chain (mapping, analysis)	Value chain categorises the value adding activities of an organisation in order to identify strategic improvements. It can cover all activities along the supply chain including: • Inbound logistics • Operations / production • Outbound logistics • Marketing and sales demand • Maintenance • Administrative infrastructure management • Human resource management • Technology and procurement.
Value stream (mapping, analysis)	Value stream identifies the value add activities within a process, to identify improvements. It focuses individual processes within an organisation, usually targeting the flow of material and information.
Water Savings Action Plans	NSW Government introduced legislation in May 2005 requiring high users and local councils in Sydney Water's area to prepare Water Savings Action Plans; includes businesses in Sydney Water's area of operations with a site using more than 50 million litres of water a year and a list of designated water users

Sustainability Practice

Application	Skills	Knowledge	Range
Engineers, technicians, managers measuring and reporting carbon use / carbon equivalence	Measuring carbon emissions Calculating mass balance and materials balance Calculating carbon emissions, substitution and equivalence rates Mapping and analysing the value chain Reporting Engaging with other enterprises in the value chain Ensuring “green” claims can be substantiated	Carbon equivalence of different emissions Embedded carbon Carbon footprint Carbon emission sources Legislation and regulations	Carbon footprint may apply to whole or a portion of a value chain which may be internal or external to the workplace Measuring carbon use may occur as part of regulatory obligations, or social or market responses
Engineers, technicians, managers measuring and reporting energy use	Mapping and analysing the value chain Reporting Calculating energy balances Performing energy audits Identifying sources and uses of energy	Renewable vs non renewable energy NGERS reporting requirements and thresholds Nature of energy wastage Waste reduction strategy Energy types Legislation and regulations	Reasons to do an energy audit may include; regulatory, improving sustainability or ensuring “green” claims can be substantiated Electricity Gas Steam Renewable energy sources eg wind, solar Reporting requirements eg NSW Energy Savings Action Plans

Sustainability Practice

Application	Skills	Knowledge	Range
Engineers, technicians, managers measuring and reporting water use	Using competitive manufacturing tools and techniques Mapping and analysing the value chain Reporting Ensuring "green" claims can be substantiated	Legislation and regulations Sources and use of water in the process	Reasons to do an water use audit may include; regulatory, improving sustainability or ensuring "green" claims can be substantiated Reporting requirements eg NSW Water Savings Action Plans
Engineers, technicians, managers measuring and reporting to meet National Greenhouse and Energy Reporting System (NGERs) requirements	Calculating carbon emissions calculations, substitution and trading Ensuring "green" claims can be substantiated Measuring and reporting emissions, discharges and airborne contaminants	Sources of emissions NGERS reporting requirements National Pollutants Inventory guide Emission Estimation Technique (EET) manual/s for the sector	Direct Indirect All types of greenhouse gases, not just CO_2 Visible Non visible Non greenhouse gas Abnormal emissions, discharges and airborne contaminants may include: noise, light, solids, liquids, water / waste / water, gases, smoke, vapour, fumes, odours, particulates, radioactivity.

Examples	Source (title and URL)
Toyota Motor Company Australia has implemented a **5 year plan to reduce water consumption by 25% per vehicle produced**. The first step was a water footprint assessment to identify current water use and waste water discharges throughout	Toyota Motor Company Australia – water use mapping case study http://www.aigroup.com.au/environment/casestudies/

Examples	Source (title and URL)
the business. The footprint provided the basis for: • Identifying and evaluating water related risks • Prioritising management efforts, setting corporate water strategy • Establishing a baseline to set strategic water goals • Evaluating progress • Accounting for the full cost of water • Setting Investing in water related environmental services	

Possible useful units of competency
MSACMS601A Analyse and map a value chain
MSS014006A Contribute to sustainability related audits
MSS015001A Measure and report carbon footprint
MSS015010A Conduct a sustainability water audit
MSS015011A Conduct a sustainability energy audit
MSS015012A Conduct an emissions audit
MSS015013A Conduct a sustainability related transport audit
MSS017002A Determine process loss through mass balancing
MSS024004A Process and present environmental data

Possible useful units of competency
MSS024006A Perform sampling and testing of water
MSS025003A Report environmental data
MSS025008A Monitor and evaluate noise
MSS025016A Perform sampling and testing of stationary emissions
MSS027005A Contribute to improving environmental performance

Operational resource efficiency

This area of application relates to identifying and implementing ways to reduce energy, fuel and water use and to maximise the use of renewable / cleaner energy for the day to day operations of the business. It is relevant to:

- Applying compliance and reporting mechanisms
- Developing strategic targets and policies
- Improving operational procedures and practices
- Identifying opportunities to reduce energy consumption and greenhouse emissions
- Training and performance management
- Using Competitive Manufacturing systems
- Using Government funding and incentive programs

Please also refer to the following related areas of application **Compliance requirements, Environmental monitoring, control and technology, Facility / building design and management, Measuring and reporting, Planning and procedures, Process improvement, Supply chain, Waste management** and **Workforce planning and workplace culture**.

Keywords	Description
Cleaner energy sources / fuels	Sources that are lower greenhouse gas emission intensive. These come from natural resources such as sunlight, wind, rain, tides and geothermal heat, also known as renewable energy (naturally replenished).
Cogeneration	Combined opportunities for cooling, heating and power
Conservation and management of existing resources	Self explanatory
Dematerialisation	Dematerialisation is an approach to managing waste based on resource efficiency, waste prevention and recycling.
Energy recovery	Energy recovery includes any technique of minimising the input of energy to a system by exchanging energy from one sub-system with another. The energy can be in any for in either sub-system but most energy recovery systems exchange thermal energy in either sensible or latent form. Examples include:

Keywords	Description
	• Hot water from steel production being sold to help heat businesses and homes in the local area • Regenerative braking systems that convert potentially lost energy from braking into electricity that can be fed into the vehicle's batteries
National Pollutant Inventory reporting requirements (NPI)	Businesses have to report on their emissions and waste transfers, if they trip the reporting thresholds for 93 substances, rates of burning waste / fuel and the rate and type of electricity usage. A series of Emission Estimation Technique (EET) manuals have been developed for each reporting industry which outline of how the industry processes work and the related emissions points. The full list of manuals is available on the NPI website at: http://www.npi.gov.au/handbooks/approved_handbooks/sector-manuals.html The aim of the program is to: • Maintain and improve air and water quality • Minimise environmental impact associated with hazardous waste • Improve the sustainable use of resources
Renewable materials	Raw materials from renewable sources that are managed to avoid depletion, for example, wood form managed plantations, fast growing crops such as bamboo.
Renewable vs non renewable energy	Sun, wind, water and geothermal are renewable (self sustainable) energy sources. However they can be expensive to harness and large amounts are required to produce small amounts of energy. Oil, natural gas and coal are non-renewable sources and are efficient as small amounts can produce relatively large amounts of energy.
Re-using and recycling water	Capture and re-use of water, may include treatment of water for re-use.
Shutdown energy use	How much is used while a site is shut down eg over the weekend

Sustainability Practice

Application	Skills	Knowledge	Range
Supervisors / managers using energy sources with less greenhouse gas emissions	Researching and analysing alternatives Negotiating energy tariffs and contracts with suppliers Measuring and calculating energy use and costs Interpreting greenhouse gas emissions data	Sources of energy – grid / on site / renewable Alternative sources of energy generation / energy recovery Electricity generation Renewable Energy Target Greenhouse gas abatement programs	Co-generation Carbon Management Response Plan Gas Electricity generation may be: Black coal Brown coal Geothermal Hydroelectric Methane Natural gas Oil Photovoltaic Solar Wind
Team leaders evaluating carbon reduction and renewable energy options	Using competitive manufacturing tools and techniques Identifying and evaluating options Making recommendations Determining actions Selecting products	Carbon reduction and renewable energy options Definition of sustainability Sustainability goals of the enterprise Hazards associated with the process, plant and equipment Hierarchy of control Energy concepts	Reworking faulty products Turning off lights in unused rooms Renewable energy Carbon reduction

Sustainability Practice

Application	Skills	Knowledge	Range
	Analysing root causes	Sustainability problems	
Operations / production workers making energy and water savings in day to day practices	Using competitive manufacturing tools and techniques Analysing standard operating procedures Solving problems	Energy efficiency concepts Value chain concepts Muda and the seven wastes Options to save energy and water	Capture and reuse of water and energy Recovering residual energy from scrap products and waste Turning off lights in unused rooms, equipment on standby
Shop floor workers acting to use resources efficiently and effectively	Using competitive manufacturing tools and techniques Analysing standard operating procedures Solving problems	Principles of sustainability Procedures for waste collection Types of waste and emissions Energy saving initiatives Value chain	Energy Water Waste Reworking faulty products Minimizing use of chemicals Sorting waste for recycling Turning off lights in unused rooms, equipment on standby
Technicians / designers / engineers designing products and processes to support sustainability	Researching and analysing alternatives Communicating complex concepts Expressing results in terms of carbon equivalence	Dematerialisation Sustainability issues and impacts Life cycle analysis Renewable materials Materials with less embodied energy	Energy Water Waste Materials Recycling Co-generation Renewable sources of energy such as photovoltaic Identifying opportunities to reduce energy consumption and greenhouse

Sustainability Practice			
Application	**Skills**	**Knowledge**	**Range**
			emissions Working with suppliers to reduce emissions of supplies Local materials to save transport emissions
Managers reducing travel and using alternative methods of communication	Collecting and analysing data Solving problems Identifying travel completed and future travel requirements Analysing costs and benefits	Alternatives to travel Types of communication media Value chain	Videoconferencing Skype Carbon offsets

Examples	Source (title and URL)
Jellinbah mine has implemented a tyre pressure management system, which is estimated to produce a **5 percent saving in fuel consumption**, and which in 2007–08 equated to a saving of 370,000 litres of fuel or 14,282 GJ of energy.	QLD Coal Mine Management. Truck tyre pressure management First Opportunities A look at results from 2006-2008. For the Energy Efficiency Opportunities Program at www.energyefficiencyopportunities.gov.au
Process control improvements reported by enterprises included installation of automated control systems in place of manual systems to adjust energy use to system demand. In some cases existing control algorithms were refined, or existing manual adjustment procedures were revised.	First Opportunities A look at results from 2006-2008. For the Energy Efficiency Opportunities Program at www.energyefficiencyopportunities.gov.au
BHP Billiton achieved an estimated **0.54 PJ saving** through replacement of two steam turbine generator steam dump valves at the Kalgoorlie Nickel Smelter.	First Opportunities A look at results from 2006-2008. For the Energy Efficiency Opportunities Program at www.energyefficiencyopportunities.gov.au
Toyota (MSA conference 2010) Toyota achieved **reduction in shutdown energy use** from 121 MW hrs per day to 78; the improvements came from the shop floor – workers switching things off by hand, knowing this is on but is shouldn't be.	

Possible useful units of competency
ESB802A Research and recommend sustainable water use in buildings
LMFFDT5002 Apply resources sustainably
MSACMT430A Improve cost factors in work practices
MSACMT670A Develop and manage sustainable energy practices
MSAENV272B Participate in environmentally sustainable work practices

Possible useful units of competency
MSAENV472B Implement and monitor environmentally sustainable work practices
MSAENV672B Develop workplace policy and procedures for environmental sustainability
MSS014001A Improve sustainability through readily implementable change
MSS014003A Optimise sustainability of a process or plant area
MSS014004A Develop team strategies for more sustainable use of resources
MSS015004A Design sustainable product or process

Planning and procedures

This area of application relates to planning for sustainability and developing procedures and is relevant to:

- Prioritising
- Planning work requirements and task sequences to minimise all aspects of waste (Muda)
- Managing change in the workplace
- Developing and implementing policies and procedures to support business goals/strategy
- Training and performance management
- Implementing strategic plans

This area relates to all other areas of application.

Keywords	Description
Change management	Change management is a structured approach to shifting / transitioning individuals, teams or organisations from a current state to a desired state. It is an organisational process that aims to empower employees to accept changes in the current work environment. In project management it refers to a formal process for approving changes to scope.
Job Safety Assessments / Job Safety Analysis	Job Safety Analysis (JSA) is a method of identifying hazards and developing ways to manage them prior to undertaking a specific task or procedure.
Occupational health, safety and environment systems (OHS, SHE etc)	Development, review and application of policies and procedures in health, safety and environment which often align to aspects of sustainability.
Policy and procedure development	Structured process for drafting, consulting, reviewing and implementing policies and procedures to support desired work practices.
Standard Operating Procedures	Outlines the standard steps and work processes for a task/job of work.
Work Instructions	Outlines the standard steps and work processes for a task/job of work.

Sustainability Practice

Application	Skills	Knowledge	Range
Shop floor workers organising their workspace for efficiency, reduced use of resources and reduced waste	Using competitive manufacturing tools and techniques Analysing processes and standard operating procedures Implementing improvements Communicating with stakeholders	Value chain concept Sustainability problems Muda and the seven wastes	Organising tools and materials Minimizing use of chemicals Sorting waste for recycling Reworking faulty products Turning off lights in unused rooms
Middle managers planning for implementation of improvements to processes	Using competitive manufacturing tools and techniques Consulting and negotiating with stakeholders Analysing data Reporting	Legislation and regulations Incentives available Methods for improvement	Reducing carbon emissions Water use Waste generation Life cycle of product Process efficiency Impact on the environment
Managers implementing the enterprise's strategic commitment to social capital, ethical trading, human rights, equal opportunity etc	Identifying and evaluating the ethical and social impact of business practices Interpreting enterprise policies and procedures Interpreting regulations, legislation and codes of practice Developing policies and procedures Communicating Consulting Performance management and review Researching and interpreting policies, regulations and codes of practice	Workplace ethics Fair trading Inter regional and inter country equity Relevant legislation and reporting requirements eg Equal Opportunity Trade practices Consumer law Strategies to support social sustainability in the industry context	Social sustainability strategies may include: Ethical supply chain considerations Social impact assessments for new products / processes Social inclusion mechanisms
Managers developing and implementing	Identifying practices and processes	Relevant legislation and reporting	Environmental sustainability may

Sustainability Practice			
Application	**Skills**	**Knowledge**	**Range**
policy and procedures to maximise environmental sustainability	Consulting with stakeholders Trialing and evaluating procedures Monitoring and reviewing implementation Managing change Developing strategic sustainability plans	requirements Sustainability impacts	include reducing emissions, increasing productivity and making use of incentives and covenants.
Supervisors / managers ensuring social sustainability aspects of policies and procedures are applied	Modeling ethical behaviour Managing and reviewing performance Communicating	The potential impact of the organisation on the local and broader community	May include: Industrial relations Anti-discrimination Non discriminatory attitudes and language Duty of Care Rights and responsibilities aspects of sustainability.

Examples	Source (title and URL)
Rejuvenation, a manufacturer of period-authentic reproduction lighting and hardware, used an **environmental management system** based on The Natural Step and Lean manufacturing. Rejuvenation has reduced its environmental wastes and increased quality and profit. Prior to Lean implementation, finished products were not inspected until the end of the line at a quality control center, causing expensive rework if mistakes were found. Through Lean events, the quality control center was eliminated, quality control became everyone's job, and customisation errors are now corrected before moving on to the next process. Rejuvenation also regularly implements other Lean tools such as 5S, kaizen events, and value stream mapping.	Rejuvenation http://www.epa.gov/lean/studies/rejuvenation.htm

Possible useful units of competency
AUM2901B Develop and produce documentation and procedures
AURC172003A Identify environmental regulations and best practice in a workplace or business
AURC472082A Plan and manage compliance with environmental regulations in a workplace or business
MSACMT670A Develop and manage sustainable energy practices
MSAENV672B Develop workplace policy and procedures for environmental sustainability
MSS015002A Develop strategy for more sustainable use of resources
MSS015007A Develop a business case for sustainability improvements
MSS015008A Develop strategic sustainability plans
MSS015009A Implement sustainability plans
MSS027012A Implement and maintain the site OHS management system
PMASUP520B Review procedures to minimise environmental impact

Process improvement

This area of application relates to identifying and implementing process improvements for the day to day operations of the business and is relevant to:

- Applying tools such as value stream mapping and eco stream mapping to analyse processes
- Retooling, re-engineering and right sizing
- Re-skilling the workforce
- Making changes to reduce waste

Please also refer to the following related areas of application - **Environmental monitoring, control and technology, Measuring and reporting, Operational resource efficiency, Planning and procedures, Product improvement and life cycle, Supply chain, Waste management** and **Workforce development and workplace culture**.

Keywords	Description
Cradle to grave / Cradle to cradle	See **Product improvement and life cycle** area of application
Eco stream mapping	Focuses on the environmental aspects of materials usage eg what is the impact on the environment, can we re-use, recycle, remanufacture?
Energy balancing	See **Energy balancing** keyword
Energy recovery	See **Operational resource efficiency** area of application
Mass balancing	See **Mass balancing** keyword
Re-use, recovery, re-cycling, re-manufacture	See **Waste management** area of application
Right sizing	Redesign / upgrading of plant and equipment for better fit to production requirements, see EPA USA case study Apollo
Up-cycling	Upcycling is the process of converting waste materials or useless products into new materials or products of better quality or a higher environmental value.
Value stream(mapping, analysis)	Value stream identifies the value add activities within a process, to identify improvements. It focuses individual processes within an organisation, usually

Keywords	Description
	targeting the flow of material and information.
Waste (Muda) / seven wastes	See **Waste management** area of application

Sustainability Practice

Application	Skills	Knowledge	Range
Team leaders and technicians doing research and analysis to identify new and/or improved processes	Using competitive manufacturing tools and techniques Comparative and critical analysis Auditing and reporting compliance Designing and developing strategies Mapping processes Managing risk Analysing true cost Mapping value chains Analysing product life cycle	Market knowledge Incentive schemes	Environmental impact statements Environmental market research Environmental risk analysis Lifecycle analysis Cradle to the grave Cradle to cradle Product stewardship Cost benefit analysis Energy mass balance
Supervisors and technicians improving processes and or production lines to make them more efficient and less wasteful	Using competitive manufacturing tools and techniques Mapping value streams Streamlining supply chains	Cradle to grave concept Sustainability issues and impacts Principles and theory of process equipment and systems used	Reskilling workers Retooling Using emerging technologies Reduce use of chemicals Reduce energy inputs Selection of 'cleaner' capital equipment

Sustainability Practice

Application	Skills	Knowledge	Range
Operators identifying ways to reuse or recycle waste generated in their area	Using competitive manufacturing tools and techniques Analysing standard operating procedures Solving problems	Sustainability impacts Value chain concept	Up-cycling Capture and reuse of resources and by-products Recycling of materials Rework faulty product
Supervisors / managers establishing new ways to capture and reuse resources and by-products	Using competitive manufacturing tools and techniques Identifying sustainability goals Analysing and using information Solving problems	Sustainability goals of the enterprise Sustainability impacts Principles behind processes Environmental sensitivities Mitigation strategies	Up-cycling Capture and reuse of resources and by-products Recycling of materials
Technicians / engineers redesigning / upgrading plant and equipment for better fit to production requirements	Analysing current plant and actual production requirements Costing business cases Liaising with stakeholders Designing / engineering equipment Managing projects Communicating and negotiating	Lean Right-sizing Process improvement technologies	Process performance Desirability rating

Examples	Source (title and URL)
GM Holden identified **process control improvements**, which could lead to savings of over 0.5 PJ per annum, or around 30 percent of energy use assessed. Opportunities included changing temperature set-points and improved humidity control for paint booths, compressed air system maintenance and leak control, and shutting down equipment during non-production periods.	First Opportunities A look at results from 2006-2008. For the Energy Efficiency Opportunities Program www.energyefficiencyopportunities.gov.au
Investment in developing the **"right-sized" equipment** required less capital than conventional machinery (or "monuments"), used less energy, fitted into small production cells, and allowed Apollo Hardwoods to fabricate the same amount of finished product using fewer logs and generating less wood scrap.	Apollo Hardwoods Company http://www.epa.gov/lean/studies/apollo.htm
Lockheed Martin identified a significant amount of **unused chemicals** going directly to the hazardous waste stream without ever being used, were expired on-shelf, or were no longer used for research or production. Lockheed Martin moved to a just-in-time chemical management system, with chemicals delivered three times a week in "right-sized" containers to meet real-time demand. This reduced chemical inventories, freed capital tied up in inventory, increased chemical inventory turns and chemical utilisation rates, and eliminated the chemical warehouse and chemicals expiring on the shelf.	Leaning chemical and hazardous waste management http://www.epa.gov/lean/environment/studies/lockheed.htm

Possible useful units of competency
AURC261314 Contribute to quality work outcomes (this unit is about economic and environmental sustainability)
LMFFDT5002 Apply resources sustainably
MSACMS201A Sustain process improvements
MSACMS400A Implement a competitive manufacturing system

Possible useful units of competency
MSACMS401A Ensure process improvements are sustained
MSACMS405A Lead a manufacturing team using a balanced scorecard approach
MSACMS601A Analyse and map a value chain
MSACMT430A Improve cost factors in work practices
MSACMT670A Develop and manage sustainable energy practices
MSAPMC555030C Analyse equipment performance
MSAPMOPS400A Optimise process or plant area
MSAPMSUP200A Achieve work outcomes (this unit is about increasing productivity, efficiency and effectiveness)
MSL934002A Apply quality system and continuous improvement processes
MSS014001A Improve sustainability through readily implementable change
MSS014003A Improve sustainability of a process or plant area
MSS015004A Design a sustainable product or process
MSS015015A Evaluate sustainability impact of a process
MSS015016A Implement and monitor reengineering for sustainability
MSS025002A Assess the environmental risk or impact of a project activity or process
MSS027005A Contribute to improving environmental performance

Product improvement and life cycle

This area of application relates to improving the sustainability features or performance of products / services. It is relevant to:

- Researching and interpreting consumer demands for more sustainable products
- Analysing product life cycle
- Ethical / sustainable supply chain decisions
- Designing or re-designing products for improved sustainability features / performance eg reliability, reduced emissions, energy efficiency, use of renewable sources of energy / materials.

Please also refer to the following related areas of application – **Community impact, Compliance requirements, Measuring and reporting, Planning and procedures, Process improvement, Supply chain** and **Waste management**.

Keywords	Description
Cradle to grave / Cradle to cradle	A holistic economic, industrial and social framework that seeks to create systems, processes or products that are not just efficient but essentially waste free. Cradle to grave – process relies on assessment of the impact of the process at every stage in the life cycle from raw materials through materials processing, manufacture, distribution, use, repair and maintenance, and disposal. Cradle to cradle – extends this to the end stage of recycling / re-use into a new process or product.
Design standards / sustainable design principles	For example • Third Edition Australian Design Rules (ADRs) – national Australian standards for vehicle safety, anti-theft and emissions. • Society for Sustainability and Environmental Engineering (SSEE) – a society of Engineers Australia which promotes information transfer on environmental issues of relevance to the environmental engineering profession and other environmental practitioners • Designers Accord – a global coalition of designers, educators and business leaders; has developed five guidelines aiming to make sustainability a mainstream idea in all aspects of design practice and production

Keywords	Description
	• Design Institute Australia – a professional body for designers which publishes Environmental Practice Notes & Sustainable Design articles
Extended Producer Responsibility (EPR)	EPR is a means to encourage producers to examine the lifecycle of their products and to identify initiatives that will reduce resource use, reduce wastes at all points in a product's whole lifecycle, reduce the environmental impacts of products and enhance post-consumer resource recovery. Hence, EPR places the responsibility primarily (but not exclusively) on the producers of the products.
Product life cycle / entire life cycle	The evolution of a product from its raw source, through its inception, development, manufacture, completion and time as a completed product until potential renewal
Product life cycle analysis	Life cycle analysis (LCA) involves taking detailed measurements during the manufacture of a product starting from the raw materials through to possible disposal, reuse or recycle. LCA enables a manufacturer to quantify how much energy raw materials, solid, liquid and gaseous waste is generated at each stage of the product's life in order to ascertain the overall environmental impact. All products have some environmental impact; the LCA helps identify processes that have direct causative factors in polluting and those that have heavy energy demand.
Product stewardship	Product stewardship extends the responsibility for environmental impact of a product to everyone involved in its life-cycle; not only manufacturers but also retailers, consumers and recyclers etc. The Product Stewardship Bill 2011 was passed by Parliament on 22 June 2011. It provides the framework to effectively manage the environmental, health and safety impacts of products in Australia. It forms part of the National Waste Policy and includes voluntary, co-regulatory and mandatory product stewardship. The first scheme to be established is the national television and computer recycling scheme where manufacturers will take back their products for reuse or remanufacture. http://www.environment.gov.au/settlements/waste/product-stewardship/index.html

Keywords	Description
True cost analysis	In true cost analysis the direct and indirect costs (cost of any harmful impacts) of a product or service is calculated and included in the 'cost' accounting. True cost rather than immediate outlay.

Sustainability Practice

Application	Skills	Knowledge	Range
Technicians / designers / engineers designing new or improved products and/or processes	Applying new technologies and/or processes to support environmental sustainability Identifying and evaluating alternatives using relevant sustainability measures Applying sustainable design principles	Sustainability strategies Australian design standards Impact of design and production options on carbon footprint Consumer preferences / demands Impact of design and production on local community Innovative packaging solutions	Sustainability strategies may include: Cradle to grave / cradle to cradle and other product life cycle models Sustainable / ethical supply chain Renewable energy sources Renewable materials Potential for reuse or recycling
Managers developing or improving products and related processes	Competitive manufacturing tools and techniques Developing specifications that include sustainability criteria Monitoring development process to achieve sustainability and product goals Applying sustainability knowledge to changes in specifications	Impact of design and production options on carbon footprint Consumer preferences / demands Impact of design and production on local community Labelling / ECA mark	Consumer preferences may include: Reduced carbon footprint Recycling / product stewardship options for used products Energy / water efficient products Locally made products Improved sustainability information such as labeling and use of the product
Supervisors / team leaders playing a role in the development / improvement of products and related processes	Competitive manufacturing tools and techniques Interpreting production specifications Planning and scheduling production to	Renewable energy Renewable materials Sustainable / ethical supply chain Waste (MUDA) reduction practices	See areas of application: Operational energy efficiency Supply chain Waste management Workforce planning and workplace

Sustainability Practice			
Application	**Skills**	**Knowledge**	**Range**
	improve sustainability measures Allocating team tasks efficiently and effectively Providing training/mentoring to team		culture
Product managers developing new environmentally friendly products	Commercialisation initiatives Deployment into markets Utilising offset /environmental mitigation schemes Utilising incentives / government assistance to implement product and/or process efficiencies	Consumer preferences / demands Incentive schemes Regulatory requirements Research and funding opportunities Labelling / ECA mark	Incentive schemes may include: Australian Packaging Covenant Greenhouse Gas Abatement Scheme Renewable Energy Target Sustainability covenant (VIC govt, AiG and EPA) Water MAP assist (AiG) The Strategic Waste Initiatives Scheme (WA) Consumer preferences may include: Reduced carbon footprint Recycling options for used products Energy/water efficient products Locally made products Improved sustainability information such as labeling and use of the product Offset/ environmental mitigation schemes may include: Carbon trading Mitigation banking Biosequestration projects

Sustainability Practice

Application	Skills	Knowledge	Range
Technicians / designers / engineers undertaking research and analysis to identify product improvements	Comparative and critical analysis Compliance auditing and reporting Designing and developing strategies Process mapping Risk management True cost analysis Value chain mapping Product life cycle analysis	Market knowledge Incentive schemes	Environmental impact statements Environmental market research Environmental risk analysis Lifecycle analysis Cradle to the grave Cradle to cradle Product stewardship Cost benefit analysis Energy / mass balance
Product developers extending the life cycle of products	Comparative and critical analysis Product life cycle analysis Design and engineering	Cradle to cradle Consumer preferences / demands	Easy maintenance and repair Increased reliability and durability Integrated product functions Modularity Extended life spans Energy use Cradle to cradle considerations may include: Re-use, recovery, recycling and remanufacturing options Extended Producer Responsibility (EPR)
Designers developing products for low energy consumption at end use	Product life cycle analysis True cost analysis	Australian design standards Sustainable design principles	Product low energy consumption considerations may include:

Sustainability Practice			
Application	**Skills**	**Knowledge**	**Range**
	Design and engineering	Consumer preferences / demands Energy recovery	Reducing energy loss Energy recovery

Examples	Source (title and URL)
Demonstrating the **product stewardship** concept, Fuji Xerox eco manufacturing collect used Fuji products such as copiers, printers and cartridges to disassemble and sort into 74 categories including steel, aluminum, lenses, glass and copper generating 21,200t of recycled resources. These are re-used and/or re-manufactured into products of equal or better than new condition. Fuji Xerox continues to implement 3R (reduce, re-use, recycle) initiatives to achieve its goals of zero landfill, no pollution and zero illegal disposal. Fuji defines 'zero waste' as a recycling rate of 99.5%.	Fuji Xerox 'eco remanufacturing' case study www.Fuji%20Xerox%20eco%20remanufacturing%202004(1).pdf
Rigid plastic packaging **recovery and recycling into new products** - funding from Kerbside Recycling Group through Australian Packaging Covenant enabled insights into networking and marketing a new range of plastic raw materials. Investigating commercial viability of recycling post-consumer polypropylene (PP) found it to be technical feasible to recycle PP and identified a number of markets for the recyclate including: • Cable reels • Compost bins	Rigid Plastic Packaging Recovery and Recycling http://www.packagingcovenant.org.au/page.php?name=natrigidplasticpackagingrecoveryandrecycling0105

Examples	Source (title and URL)
• Export pallets • Trenching products • Binders / folders • Pot planters • Desk calendars	

Possible useful units of competency
LMFFDT4003A Assess and record the lifecycle of a product
LMFFT5013B Develop products and related processes
LMFID4002A Decorate residential interiors
LMFID4004A Research and recommend furniture and accessories
MSS015003A Analyse product lifecycle for sustainability
MSS015004A Design a sustainable product or process

Supply chain

This area of application is about sustainability practice throughout the supply chain from raw materials through to end use by the consumer. It is relevant to:

- Evaluating the sustainability record of suppliers in procurement decisions
- Sourcing local materials / suppliers
- Fair trade options
- Sources of renewable energy / materials
- Operational decisions & contracting
- Packaging, transport and warehousing decisions
- Providing customers with information to support sustainable selection and use of products
- Monitoring & complaints mechanisms

Please also refer to the following related areas of application - **Community impact, Governance and strategy, Measuring and reporting, Planning and procedures, Process improvement, Product improvement and life cycle, Waste management** and **Workforce planning and workplace culture**.

Keywords	Description
Australian Packaging Covenant	The Australian Packaging Covenant is the voluntary component of a regulatory arrangement based on the principles of shared responsibility through product stewardship, between key stakeholders in the supply chain and all levels of government. The Covenant is designed to minimise environmental impacts arising from the disposal of used packaging, conserve recourses through better design and production processes and facilitate the re-use and recycling of used packaging materials.
Carbon footprint	The total amount of carbon dioxide emissions that is directly and indirectly caused by an activity or is accumulated over the life stages of a product.
Cradle to grave / Cradle to cradle	A holistic economic, industrial and social framework that seeks to create systems, processes or products that are not just efficient but essentially waste free. The process relies on assessment of the impact of the process at every stage in the

Keywords	Description
	life cycle from raw materials through materials processing, manufacture, distribution, use, repair and maintenance, and disposal or recycling. Cradle to cradle refers to a process whose end stage is recycling / re-use into a new process.
Eco consumption	Customer behaviour with the product e.g. to minimise energy or fuel consumption. Studies indicate, for example, that eco driving can get 20-25% efficiency gains in fuel use.
Embedded carbon / embodied carbon	An item's carbon content is the total amount of carbon dioxide emitted from every stage of its production and distribution from the source to the store. This is also known as embedded carbon. The total of carbon consumed in the manufacture, use and disposal of the product expressed as CO_2 equivalent tonnes.
Environmental Choice Australia (ECA) mark	The Environmental Choice Australia mark (also referred to as the Environmental Choice Australia Ecolabel) is the ecolabel awarded to applicants voluntarily conforming to Good Choice Australia (GECA) standards, after an audit by a GECA appointed auditor.
Extended product / producer responsibility	See **Waste management** area of application
Lower material weight and volume	Examples include washing detergent with half the volume but twice the strength.
Product information / labelling	See **Environmental Choice Australia Mark** keyword
Product life cycle / Entire life cycle	See **Product improvement and life cycle** area of application
Product stewardship	See **Product improvement and life cycle** area of application
Rapidly Renewable	A resource capable of being replaced in less than 10 years time (harvest maturity) by natural ecological cycles. Examples include natural fibres, bio-based polymers and regenerated bamboo. Cellulosic fibres such as acetate, viscose rayon and lyocell

Keywords	Description
	are excluded.
Value chain	See **Measuring and reporting** area of application
Value stream	See **Measuring and reporting** area of application

Sustainability Practice

Application	Skills	Knowledge	Range
Managers responsible for developing and implementing supply chain / procurement policies and procedures	Identifying practices and processes Consulting with stakeholders Trialing and evaluating procedures Monitoring and reviewing implementation Managing change	Change management Performance management Supply chain criteria	Supply chain policies may define criteria for supplier performance in areas such as: Corporate Social Responsibility systems Carbon footprinting Environmental management systems Environmental or OHS incident rates Global Reporting Initiative Human rights and work conditions Recycling / product life cycle management Renewable or man made materials Renewable energy
Supervisors / managers contributing to sustainable supply chain decisions	Competitive manufacturing tools and techniques Reading and interpreting MSDS and	Methods for calculating embedded carbon Supply chain policies and procedures	MSDS requirements for supplies Product information, labeling and 'ecolabel' systems

Sustainability Practice

Application	Skills	Knowledge	Range
	product information Measuring energy use and greenhouse gas emissions along supply chains Calculating embedded carbon Researching options and making comparisons	MSDS Renewable sources of energy and materials Efficient handling and distribution methods Australian Packaging Covenant Sustainability measures of supply chains	Transport Sustainability measures of supply chain may include: Social impact statements and activities Use of renewable sources of energy/ materials Carbon footprint calculations Participation in voluntary schemes such as Global Reporting Initiative Formal complaints / fines / industrial action against the supplier in terms of work conditions, human rights, environmental damage, workplace injury, governance
Managers contracting suppliers who meet enterprise requirements for social sustainability	Reviewing and comparing options Applying sustainability criteria within contracts and selection criteria Monitoring performance against contract requirements	Performance management Supply chain criteria Social sustainability indicators	Social sustainability indicators may include evidence of: ethical trading non-exploitative practices / human rights ethical governance practices Indigenous and community relationships Compliance with privacy principles, Equal Opportunity for Women in the Workplace Act (1999)

Sustainability Practice

Application	Skills	Knowledge	Range
Operations / production workers providing advice to customers about sustainability aspects of products and services	Communicating and consulting with internal and external customers Sourcing and interpreting sustainability data	Policy, procedures and lines of responsibility for customer service Product stewardship Sustainability of products e.g. sustainable timber, carbon emissions for different types of products Cradle to the grave / Cradle to cradle Sustainable aspects of the supply chain	Consumers Internal customers External customers Sustainability aspects of product and services may include: Return of used products / packaging for recycling or remanufacture Sources of materials and energy used in production Information about carbon footprint Sustainability aspects of supply chain may include measures such as: Human rights record Corruption complaints / convictions Use of renewable energy / materials Environmental incident / accident record
A team increasing sustainability of a product from the cradle to the grave / cradle	Competitive manufacturing tools and techniques Measuring energy use and greenhouse gas emissions along supply chains Identifying opportunities for re-use, recycling or remanufacture	Cradle to cradle Efficient handling and distribution methods Australian Packaging Covenant Supply chain	Product stewardship Entire life cycle Extended product / producer responsibility Packaging Transport and logistics
A production manager applying the Australian Packaging Covenant	Identifying opportunities to reduce packaging and/or use recyclable	Australian Packaging Covenant Cradle to the grave / Cradle to cradle	See Australian Packaging Covenant keyword

Sustainability Practice			
Application	**Skills**	**Knowledge**	**Range**
	materials Providing consumers with information to dispose of packaging appropriately Offering packaging return systems		

Examples	Source (title and URL)
Fuji Xerox web site describes their **Environmental Standards on paper sourcing** – "To qualify as a supplier of FXA copy papers, there are a number of basic requirements that must be met and confirmed in annual declarations". Among others these include human rights: "That the supplier will maintain compliance with the minimum conditions of the United Nations Global Compact and, if not a signatory to the Global Compact, will commit to becoming a signatory within a specified time frame."	https://www.xeroxsupplies.com.au/environment
Companies that can deliver **products and services with fewer environmental impacts** have the potential to capture significant competitive advantage, provided that there are not sacrifices in time, quality, or cost. In many markets products with superior environmental performance throughout the supply chain can attract new customers.	Deliver what customers and employees want http://www.epa.gov/lean/toolkit/ch1.htm
Toyota (MSA conference 2010) has identified that the **consumer's use of a vehicle** generates 80% of the total emissions of the vehicle.	

Examples	Source (title and URL)
Behaviours such as keeping correct tyre pressure, 'eco-driving' can equate to 44 tonnes per car across the life of the vehicle - which is the same effect as having made the car from carbon neutral materials.	

Possible useful units of competency
MSACMC610A Manage relationships with non-customer external organisations
MSACMG709A Facilitate improvements in the external value chain
MSACMS601A Analyse and map a value chain
MSS015003A Analyse product lifecycle for sustainability

Waste management

This area of application relates to the reduction waste in the broadest sense (inefficient use of capital / human / physical resources) and improved treatment and disposal of physical waste. It is relevant to:

- Developing continuous improvement strategies that focus on minimising all aspects of waste (Muda)
- Making changes to reduce waste materials / product
- Reduced water consumption, filtering / re-use of water
- Identifying strategies to divert waste from landfill eg re-use, recovery, recycling
- Following policies and procedures for safe disposal of waste

This area ties into all other areas of application.

Keywords	Description
Carbon sequestration	Carbon sequestration is the general term used for the capture and long term storage of carbon dioxide, i.e its removal from the earth's atmosphere. Capture can occur at the point of emission (say at a power plant) or through natural process such as photosynthesis. Sequestration methods include: • Enhancing the storage in the soil (soil sequestration) • Enhancing the storage of carbon in the forests and other vegetation (plant sequestration or biosequestration) • Storing carbon in underground geological formations (geosequestration) • Storing carbon in the ocean (ocean sequestration) • Subjecting carbon to chemical reactions to form inorganic carbonates (mineral carbonation)
Cleaner energy sources / fuels	Sources that are lower greenhouse gas emission intensive. These come from natural resources such as sunlight, wind, rain, tides and geothermal heat, also known as renewable energy (naturally replenished).

Keywords	Description
Emissions	See **Environmental monitoring, control and technology** area of application
Extended Producer Responsibility (EPR)	EPR is a means to encourage producers to examine the lifecycle of their products and to identify initiatives that will reduce resource use, reduce wastes at all points in a product's whole lifecycle, reduce the environmental impacts of products and enhance post-consumer resource recovery. Hence, EPR places the responsibility primarily (but not exclusively) on the producers of the products of concern.
On site water treatment	For example lagoons / reed beds / reverse osmosis
Recovery	A process that aims to separate and/or capture materials and substances for re-use, re-manufacture, re-cycling (etc), diverting them from the waste stream. Mainly refers to: • Material recovery – ie packaging, plastic (etc) • Energy recovery – see **Energy recovery** keyword • Biological – eg composting • Chemicals/compounds – eg lead, cadmium, mercury, chromiumVI from computers.
Recycle	Re-cycling refers to processing of used materials into new products, preventing waste and reducing consumption of raw materials, energy use, air pollution from incineration and water pollution from landfill.
Re-manufacture	Re-manufacture is a process of disassembly and recovery at the module and/or component level. It differs from other recovery processes in its completeness ie a re-manufactured machine should match the performance and expectation of a new machine.
Re-use	Re-use of an item more than once, including conventional re-use for the same function or new life when it is used for a new function, generally without significant transformation.

Keywords	Description
Trade waste	Trade waste is the liquid waste generated from any business trade industry or manufacturing process; it does not include domestic waste water. Trade waste should be managed to: • Minimise the cost to the community of processing the waste • Ensure environmental protection • Encourage waste minimisation
Waste (Muda) / seven wastes	Muda is a key concept within the Toyota Production System derived from a traditional Japanese term. It refers to an activity that does not contribute to benefit as perceived by the customer ie what the customer will pay for. There are usually seven areas of waste identified, known as the seven deadly wastes: T Transportation: moving things between processes, from one work station to another I Inventory: excess stock of raw materials, parts, finished product M Motion: excess human movement such as reaching for tools, bending, walking, lifting W Waiting (delay): idle time when material, information or equipment is not ready, waiting for parts or repairs, searching for things O Over-processing: producing to a higher standard, adding features that the customer does not want O Over-production: producing more (quantity) than is required to meet customer demand D Defects: producing faulty or inadequate product that does not meet customer requirements An eighth waste has also been identified which refers to undervalued / underused human potential.

Keywords	Description
	'Necessary' muda can also be identified which refers to activities that are required but are not valued by the customer, for example, compliance activities.
Waste audits	See **Audit** keyword

Sustainability Practice

Application	Skills	Knowledge	Range
Operations / production workers reporting non conformances to waste management procedures	Communication and reporting	Waste management procedures Reporting procedures	Sources of emissions Waste treatment
Production teams working to identify and reduce waste	Competitive manufacturing tools and techniques Auditing waste Measuring and calculating	Waste disposal costs Waste minimisation / reduction strategies Muda	Waste may be defined in terms of: Direct and indirect costs Emissions Resources and materials Muda (see **Muda** keyword)
Operators finding ways to re-use or recycle scrap materials and reject product	Applying knowledge of materials Taking initiative and making suggestions	Options for re-use and recycling Material specifications and MSDS	Recycling / segregation Capture and reuse of materials and by products
Technicians treating waste	Reading and interpreting MSDS Identifying and controlling hazards Analysing complex technical information	Relevant regulations / legislation and reporting requirements MSDS Range of treatment options and their potential ecological impacts	Treatment options and environmental mitigation strategies may include: Carbon sequestration (chemical, biological and geological) On site water treatments (lagoons / reed

Sustainability Practice			
Application	**Skills**	**Knowledge**	**Range**
		Environmental mitigation strategies	beds / reverse osmosis

Examples	Source (title and URL)
Barwon Regional Waste Management Group (BRWMG) collects and processes expanded polystyrene (EPS) waste. They provide a free drop off point for the bulky plastic saving businesses the cost of waste removal and diverting it from landfill. To date 129t of EPS has been diverted. BRWMG then shreds the EPS and works to find recycling opportunities for example a local concrete manufacturer has incorporated EPS into a successful range of light weight pavers.	Barwon Regional Waste Management Group http://www.enviro2010.com.au/2010/awards.html
Amcor has achieved a **48% reduction in waste to landfill** compared to 2005-06. Through a partnership with Fibre Energy P/L solid waste is being is processed to form pellets known as fibre shots, to be used as coal replacement. This accounts for 60,000t per annum of solid waste being diverted from landfill in a waste to energy process. Amcor has also developed a bacterium to digest nearly all of its 35t waste ink sludge per month. The annual expected saving in waste disposal is more than $500,000.	Amcor Packaging Group case study http://www.aigroup.com.au/environment/casestudies/
Seimens and Knox City Council launched the **storm water harvesting** project at Bayswater oval saving approximately 19ML water every year. The project captures water from Seimens head office 1.3km away then pumps it to the oval where it is stored, treated and used for irrigation.	http://www.enviro2010.com.au/2010/awards.html
Toyota (MSA conference 2010) have **reduced transport and processing** by casting their aluminium engine blocks at Altona, rather than taking the aluminium from the smelter in ingots driving it down the road to melt it down again.	

Possible useful units of competency
MSACMC411A Lead a competitive manufacturing team
MSACMS400A Implement a competitive manufacturing system
MSACMS600A Develop a competitive manufacturing system
MSACMS601A Analyse and map a value chain
MSACMS601A Analyse and map a value chain
MSACMS602A Manage a value chain
MSACMT270A Use sustainable energy practices
MSACMT670A Develop and manage sustainable energy practices
MSAENV272B Participate in environmentally sustainable work practices
MSAENV472B Implement and monitor environmentally sustainable work practices
MSAENV672B Develop workplace policy and procedures for environmental sustainability
MSS015002A Develop strategies for more sustainable use of resources
MSS024002A Implement environmental management plans and procedures

Workforce planning and workplace culture

This area of application relates to ensuring that the workforce has the skills to implement sustainable practices and is relevant to:

- Training and up-skilling workers
- Learning and applying new skills
- Developing a culture that supports sustainable work practices
- Acting as a role model for sustainable and ethical behaviour
- Taking personal responsibility for sustainable work practices

Please also refer to the following related areas of application - **Community impact, Compliance requirements, Emergency / incident response, Environmental monitoring, control and technology**, **Governance and strategy, Operational resource efficiency, Planning and procedures, Process improvement, Supply chain** and **Waste management.**

Keywords	Description
Chain of responsibility	The chain of responsibility concept identifies that all who exercise control over conduct that affects compliance will have responsibility, and may be made accountable for failure to discharge that responsibility. It has been adopted in legislation / regulation such as The Road Transport (General) Act 2005 (NSW); in the road transport supply chain this includes consignor, consignee, packer, loader and receiver, as well as the driver and operator.
Change management	See **Governance and strategy** area of application
Cultural change	Change management applied to developing desired workplace attitudes and behaviours so that they become embedded as the shared values or culture of the organisation.
Ethical practice	See **Governance and strategy** area of application
Job design	Designing jobs and position descriptions to include sustainability responsibilities.
Performance management and review	Systems for identifying expected performance in a job role and implementing strategies to assist the person to achieve it.

Keywords	Description
Recruitment and selection	Strategies such as advertising jobs, identifying the desired pool of candidate, targeting the local community, applying sustainability selection criteria.
Role modelling	Actively and consistently demonstrating the desired behaviours / attitudes.
Self management	See **Employability skills for sustainability** section
Social inclusion and participation	Active engagement with disadvantaged and vulnerable groups to encourage and support their participation; often used referring to people with a disability.
Supply chain and procurement decisions	See **Supply Chain** area of application
Teamwork	See **Employability skills for sustainability** section
Value based leadership	Value based leadership differs from traditional leadership in that it cultivates change by consistently demonstrating desired values and behaviours rather than by issuing rules, directives and punishment. Values often include: • Respect and value all staff • Encourage input and knowledge sharing • Encourage independent thinking • Encourage autonomy of staff • Communicate expectations in order to develop sense of responsibility of staff • Welcome and respond to feedback • Provide regular and constructive feedback on progress and performance.
Workforce development	A systematic approach to planning for an organisation's personnel and skill requirements and how to meet them. Usually focuses on systems and/or strategies that:

Keywords	Description
	• shape the workforce eg legislation, policy and resources • affect performance and outcomes eg support, resources, supervision, education, training, best practice guidelines • ensure sufficient pool of workers for the future with the required skills profiles eg recruitment, selection, training
Working with diversity	Workplace diversity means recognising the value of individual differences and managing them in the workplace. Diversity can refer to issues relating to: • Gender • Age • Language • Ethnicity • Cultural background • Sexual orientation • Religious beliefs • Educational level • Socioeconomic background.
Workplace culture	The shared values of an organisation that guide decisions and expected workplace behaviour. These may be overtly stated or a conveyed subtly; and the stated or desired values may not align with the actual culture.
Workplace ethics	A system of moral principles and/or rules of conduct underpinning the expectations of workplace behaviour. Most are based on principles such as: • fairness • honesty

Keywords	Description
	• loyalty to the company • obeying the law • not bringing the company into disrepute

Sustainability Practice

Application	Skills	Knowledge	Range
Operators taking personal responsibility for sustainability in the workplace	Identifying opportunities to support sustainability in production and personal activities	Understanding of the potential impact of own area of responsibility on social, environmental and economic sustainability MSDS Precautionary principle Risks to well being such as smoking, lack of sleep	Opportunities to support sustainability may arise in day to day production and personal activities in the workplace. These include, for example: Minimizing use of chemicals or selecting less hazardous options Reducing use of paper products and hard copy print outs Sorting lunchroom waste for recycling Turning off lights and equipment that are not required Showing respect for the religious beliefs and cultures of other workers Purchasing items with less packaging Considering neighbours when parking, arriving and leaving for shifts.
Managers implementing access and equity, social inclusion	Communication Negotiation Collaboration Research	Relevant legislation and reporting requirements Enterprise policies and procedures Principles of access and equity	Recognising, respecting and adapting to cultural differences in the workplace Legislation and reporting requirements for example: Equal Opportunity for Women in the

Sustainability Practice			
Application	**Skills**	**Knowledge**	**Range**
	Respect for others	Ethical standards Working with diversity Understanding the potential impact of the organisation on the local community Strategies for targeting recruitment from the local community Options for making adjustments to the workplace to accommodate workers with a disability	Workplace Act (1999) Disability Discrimination Act (1992) Racial Discrimination Act (1975)
Managers embedding sustainability into HR functions	Applying knowledge of sustainability into job design / review processes Identifying recruitment and selection sustainability criteria and KPIs Establishing initiatives in the work environment that support sustainability Planning training and development for sustainability skills	Competencies required to deliver sustainable outcomes Enterprise sustainability strategy, targets and performance measures	Recruitment and selection sustainability criteria may include: Reviewing job design to spell out sustainability responsibilities Seeking and verifying evidence of sustainability skills / experience Targeting a 'pool' of candidates from the local community Monitoring performance against sustainability KPIs Initiatives in the work environment may include: Providing power to recharge electric cars / bikes Incentives / rewards for energy saving activities Racks to secure bicycles, cycle paths Kitchen equipment and coffee machines that reduce take-away food and throw

Sustainability Practice			
Application	**Skills**	**Knowledge**	**Range**
			away containers Areas with trees, plants, tables and chairs available for breaks and team and social activities
Managers showing leadership and role-modeling to support sustainable work practices	Interpreting policies and procedures Understanding and practicing enterprise values Applying procedures and values in challenging situations such as disputes, conflicts and non-conformances	Enterprise policies and procedure Enterprise values and ethical standards Management models and leadership strategies	Value based leadership is a model that generally aligns to sustainability
Production supervisors managing cultural change in the workplace	Communicating and collaboration Negotiating Providing information and feedback Identifying resistance to change and developing strategies Identifying and prioritising aspects of workplace culture requiring change	Enterprise policies and procedure Enterprise values and ethical standards Methods of achieving cultural change Ethical standards Access and equity Working with diversity	May depend on the drivers for change and the disparity between the current and desired workplace culture

Examples	Source (title and URL)
Eco Driving training – Linfox has analysed driving behaviours that maximise fuel economy and has developed a training system for its operators. Over the next 24 months it is planned to train all Linfox Vehicle Operators in Eco Driving to achieve an estimated 4.8 % reduction in energy use.	Linfox Eco Driving program First Opportunities A look at results from 2006-2008. For the Energy Efficiency Opportunities Program www.energyefficiencyopportunities.gov.au
Cemex developed a **fuel savings operation guide** for all mobile equipment operators (involving 726 units). An outlay of $100,000 resulted in energy savings per annum of:	First Opportunities A look at results from 2006-2008. For the Energy Efficiency Opportunities Program

Examples	Source (title and URL)
• 11,000 GJ (284,598 L diesel) • greenhouse gas reductions of 760 tCO2-e	www.energyefficiencyopportunities.gov.au

Possible useful units of competency
AUM2901B Manage personal workplace
BSBSMB408B Manage personal, family, cultural and business obligations
LMTFD2004B Work within an indigenous cultural framework
MSACMC411A Lead a competitive manufacturing team
MSACMC612A Manage workplace learning
MSACMC614A Develop a communications strategy to support production
MSAENV272B Participate in environmentally sustainable work practices
MSAENV472B Implement and monitor environmentally sustainable work practices
MSS014004A Develop team strategies for more sustainable use of resources
MSS015018A Inform and educate organisation and community representatives on sustainability issues
MSS027001A Coordinate environmental management activities
RTD4802A Develop approaches to include cultural and human diversity
RTD4906A Develop work practices to accommodate cultural identity

Employability skills for sustainability

This table provides some examples of the relationship of Employability Skills to sustainability; it is intended as a point of reference.

Employability skill	Sample 'sustainability' employability skills
Communication	• Read and apply sustainability procedures and information • Basic numeracy for measuring, calculating and comparing • Read and understand material and product information • Provide sustainability related information to customers and/or community in suitable format • Writing to complete records or contribute to reporting on sustainability activities • Facilitate the consultative process with internal or external stakeholders or value chain members • Interpret sustainability aspects of job specifications • Give verbal and/or written feedback to improve sustainability aspects of processes • Make suggestions on sustainability improvements
Teamwork	• Undertake appropriate and effective communication with team members from diverse cultures and backgrounds • Mentor team members on energy efficiency practices and procedures • Apply team leadership and development techniques to improve commitment to sustainability • Communicate sustainability information for coworkers in a team • Implement team activities to promote inclusiveness and participation • Promote a workplace culture of respect and ethical practice • Establish and communicate clear performance requirements for sustainability factors
Problem solving	• Apply knowledge of materials, processes and product purpose to decide whether to rework faulty product • Identify options to reduce the energy consumption of a process • Use material and process knowledge to reduce the risk of environmental contamination • Use problem solving techniques and contingency planning to prevent recurrence of chemical spills into drains • Review options and select solutions in an emergency taking into account any environmental, social and business risks
Initiative and enterprise	• Suggest process improvements that reduce energy or water consumption • Identify opportunities to re-use or re-cycle • Develop continuous improvement strategies that focus on minimising all aspects of waste (muda) • Redesign or adjust workplace practices to improve sustainability factors • Recommend corrective and/or optimisation actions that support sustainability outcomes • Develop new technologies and/or processes • Identify innovative packaging solutions

Employability skill	Sample 'sustainability' employability skills
	• Identify and manage access to government assistance / incentive programs for 'green' / efficiency / sustainability • Develop activities in 'sustainability ' markets such as carbon trading and enviro-products • Engage effectively with internal and external customers / value chain
Planning and organisation	• Plan work requirements and task sequences to minimise all aspects of waste (muda) • Participate in risk management processes • Support the implementation of participative arrangements • Manage resources taking into account sustainability factors such as ethical supply chain, cradle to cradle and sources of renewable energy / materials • Develop and monitor quality systems • Monitor and maintain product quality • Organise daily work efficiently • Initiate and maintain systems improvements
Self management	• Taking personal responsibility for work-life balance, adequate sleep, responsible use of alcohol • Diligent application of practices for sustainability within own area of responsibility • Planning own tasks to minimise lost time and wasted resources • Operate within sustainability work practices • Select and use appropriate equipment, materials, processes and procedures to support sustainability outcomes • Understand own work activities and the potential impact on sustainability • Accept responsibility for quality of own work • Maintain currency with legislative requirements
Learning	• Developing capacities to support new technologies and innovative approaches • Learning in an environment that is new and lacking vocationally skilled trainers • Keeping up to date with knowledge of emerging markets • Maintain awareness of changes in legislation eg re carbon trading, greenhouse gas emissions and related learning needs • Act on suggestions and feedback that can improve sustainability outcomes
Technology	• Use appropriate instruments to measure performance • Perform calculations using a calculator or computer software to compare energy consumption rates • Monitor and adjust machine functions to improve efficiency and quality • Make adjustments to improve equipment performance • Develop new technologies and/or processes • Apply technology to minimise energy / water consumption • Recognise hazards and follow appropriate hazard control methods • Analyse equipment performance

Relationships between areas of application

This table maps the interconnections between areas of application, as indicated in the introduction to each area of application in the main document.

Sustainability Areas of Application	1 Community impact	2 Compliance requirements	3 Emergency / incident response	4 Environmental monitoring, control and technology	5 Facility / building design and management	6 Governance & strategy	7 Measuring and reporting	8 Operational resource efficiency	9 Planning and procedures	10 Process improvement	11 Product improvement and life cycle	12 Supply chain	13 Waste management	14 Workforce planning and workplace culture
1. Community impact Assessing and managing actual / potential impact on the local and broader community.	X	X				X			X			X	X	X
2. Compliance requirements Managing compliance with the range of codes, standards, reporting schemes, incentive programs, subsidies and legislative requirements.	X	X	X	X	X	X	X		X				X	
3. Emergency / incident response This area is significant due to the range of hazardous substances and dangerous goods that are used within the MSA sectors.	X	X	X	X		X	X		X				X	X
4. Environmental monitoring, control and technology This relates to using technology to monitor and control environmental sustainability.		X		X		X	X		X				X	
5. Facility / building design and management This refers to 'big picture' building and facility management issues that are generally outside day to day operational activities.	X	X		X	X	X	X		X			X	X	
6. Governance & strategy This relates to good governance and strategic planning at senior management and Board level.	X	X				X	X		X				X	X
7. Measuring and reporting This relates to the competencies required to measure and report on sustainability.		X	X	X		X	X		X	X	X	X	X	

Sustainability Areas of Application	1 Community impact	2 Compliance requirements	3 Emergency / incident response	4 Environmental monitoring, control and technology	5 Facility / building design and management	6 Governance & strategy	7 Measuring and reporting	8 Operational resource efficiency	9 Planning and procedures	10 Process improvement	11 Product improvement and life cycle	12 Supply chain	13 Waste management	14 Workforce planning and workplace culture
8. Operational resource efficiency Identifying and implementing ways to reduce energy, fuel and water use and to maximise use of renewable/ cleaner energy in day to day operations.		X		X	X		X	X	X	X		X	X	X
9. Planning and procedures This relates to planning for sustainability and developing procedures.	X	X	X	X	X	X	X	X	X	X	X	X	X	X
10. Process improvement This relates to identifying and implementing process improvements for the day to day operations of the business.				X			X	X	X	X	X	X	X	X
11. Product improvement and life cycle This relates to improving the sustainability features or performance of products/services.	X	X					X		X	X	X	X	X	
12. Supply chain This is about sustainability practice throughout the supply chain from raw materials through to end use by the consumer.	X					X	X		X	X	X	X	X	X
13. Waste management This relates to the reduction and improved treatment of all types of waste (Muda).	X	X	X	X	X	X	X	X	X	X	X	X	X	X
14. Workforce planning and workplace culture This relates to ensuring that the workforce has the skills to implement sustainable practices.	X	X	X	X		X		X	X	X		X	X	X