

Waste Management 2020 and beyond

Final Report

prepared for

Southern Waste Strategy Authority

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CONTENTS

EXECUTIVE SUMMARY.....	I
1. INTRODUCTION.....	1
2. WASTE MANAGEMENT FRAMEWORK.....	2
2.1 SOUTHERN WASTE STRATEGY AUTHORITY	2
2.2 GOVERNMENT POLICY.....	5
2.3 OTHER GOVERNMENT AUTHORITIES.....	9
2.4 OTHER STAKEHOLDERS.....	12
3. CURRENT WASTE MANAGEMENT PRACTICES.....	13
3.1 INFRASTRUCTURE AND SERVICES	13
3.2 MATERIAL GENERATION & DISPOSAL.....	27
3.3 REGIONAL PROGRAMS	31
4. INDUSTRY TRENDS.....	34
4.1 GOVERNANCE & FUNDING.....	34
4.2 WASTE MINIMISATION	39
4.3 COLLECTION SYSTEMS.....	40
4.4 RESOURCE RECOVERY.....	41
4.5 LANDFILLS AND RESOURCE RECOVERY CENTRES	44
4.6 WASTE TREATMENT TECHNOLOGIES	45
4.7 LITTER & ILLEGAL DUMPING.....	54
5. DISCUSSION.....	56
5.1 GUIDING PRINCIPLES	56
5.2 WASTE CHALLENGES & OPPORTUNITIES	57
5.3 MANAGEMENT STRUCTURES	65
6. ANALYSIS OF OPTIONS	78
6.1 WASTE MANAGEMENT OPTIONS.....	78
6.2 GOVERNANCE MODELS.....	82
6.3 ASSESSMENT SUMMARY	86
7. DEVELOPING A VISION FOR 2020 AND BEYOND	88
REFERENCES	93

APPENDICES

Appendix A Stakeholder Consultation

FIGURES

Figure 2.1 Map of SWSA Member Councils	3
Figure 3.1 Council Service Costs per Household.....	25
Figure 3.2 Council Contract Expiry Dates.....	26
Figure 3.3 Landfilled Waste 2002/03 – 2009-10.....	28
Figure 3.4 Waste Generation Rates.....	29
Figure 3.5 Kerbside Recycling Rates	30
Figure 3.6 Waste Disposal Pathways from 2011.....	31
Figure 3.7 SWSA Member Fees 2002/03 – 2010/11.....	32
Figure 4.1 Interstate Governance Model.....	35

Figure 4.2	Victorian Waste Generation 1999-2009	39
Figure 4.3	National Litter Results 2005-10 (by number).....	54
Figure 4.4	National Litter Results 2005-10 (by volume)	54
Figure 5.1	Waste Management Hierarchy	56
Figure 5.2	Landfills Estimated Lifespan.....	64

TABLES

Table 2.1	SWSA Member Contributions 2010/11.....	4
Table 2.2	2006-2011 Strategies of SWSA	5
Table 2.3	Local Government Responsibilities in Tasmanian Waste Strategy	6
Table 3.1	Municipal Waste Infrastructure.....	22
Table 3.2	Material Collected 2009/10	23
Table 3.3	SWSA Council Services	24
Table 3.4	SWSA Collection Methods & Frequencies	24
Table 3.5	SWSA Waste Contractors.....	26
Table 4.1	Australian Solid Waste Levies 2010/11.....	37
Table 4.2	Summary of Technologies.....	51
Table 5.1	Potential Levy Revenue.....	76
Table 6.1	Summary of Waste Management Options Assessment.....	82
Table 6.2	Summary of Governance Options Assessment	86
Table 7.1	Recommendations – Governance.....	91
Table 7.2	Recommendations – Waste Management	91

ABBREVIATIONS

APC	Australian Packaging Covenant
AWT	Alternative waste treatment technology
C&D	Construction and demolition waste
C&I	Commercial and industrial waste
CPI	Consumer price index
DCCEE	Department of Climate Change and Energy Efficiency
DECCW	NSW Department of Environment, Climate Change & Water
DED	Department of Economic Development
DEPHA	Department of Environment, Parks, Heritage and the Arts
DPIPWE	Department of Primary Industries Parks Water and Environment (formerly DEPHA & DTAE)
DTAE	Department of Tourism, Arts and the Environment
EPA	Environment Protection Authority
EPHC	Environment Protection and Heritage Council of Australia and New Zealand
EPR	Extended producer responsibility
HDPE	High density polyethylene
LDPE	Low density polyethylene
LGAT	Local Government Association of Tasmania
LGB	Local Government Board
LLDPE	Linear low density polyethylene
MGB	Mobile garbage bin
MRF	Material recovery facility
MSW	Municipal solid waste
NEPM	National Environment Protection Measure
NPC	National Packaging Covenant
OECD	Organisation for Economic Cooperation and Development
OHS	occupational health and safety
PET	Polyethylene terephthalate
PSS	Product stewardship strategy
PVC	Polyvinyl chloride
RDF	Refuse derived fuel

RID	Regional illegal dumping
RRC	Resource recovery centre
SME	Small to medium enterprise
STCA	Southern Tasmanian Councils Authority
SWSA	Southern Waste Strategy Authority
WAC	Waste Advisory Committee
WMG	Waste management group
WTT	Waste treatment technology

EXECUTIVE SUMMARY

Introduction

The Southern Waste Strategy Authority (SWSA) commissioned Blue Environment Pty Ltd to undertake a review of waste management and governance practices in southern Tasmania. The objective of the review is to develop a coordinated vision for solid waste management across the 12 member councils of SWSA, and the optimum governance structures to implement it.

SWSA was established in 2001 to facilitate integrated regional strategic planning and implementation of the *Southern Waste Management Strategy*. SWSA member councils comprise Brighton, Central Highlands, Clarence, Derwent Valley, Glamorgan Spring Bay, Glenorchy, Hobart, Huon Valley, Kingborough, Sorell, Southern Midlands and Tasman Councils. Member councils fund SWSA activities via a voluntary levy equivalent to \$2 per tonne of waste landfilled, although external funding and adjustments where waste tonnages are not known have meant that for most of SWSA's period of operation the amount paid has been less (ranging from \$1.18 per tonne in 2002/03 to \$1.70 per tonne in 2009/10).

SWSA has played a strategic policy development and liaison role with the state government, the two other Tasmanian waste management groups (in the Northern Tasmania and Cradle Coast regions), industry, community and other stakeholders. Its programs have largely focused on communication and education initiatives, sometimes supplemented by external funding. It has also assisted in regional contracting by member councils and expanded waste expertise in the region through information-sharing networks.

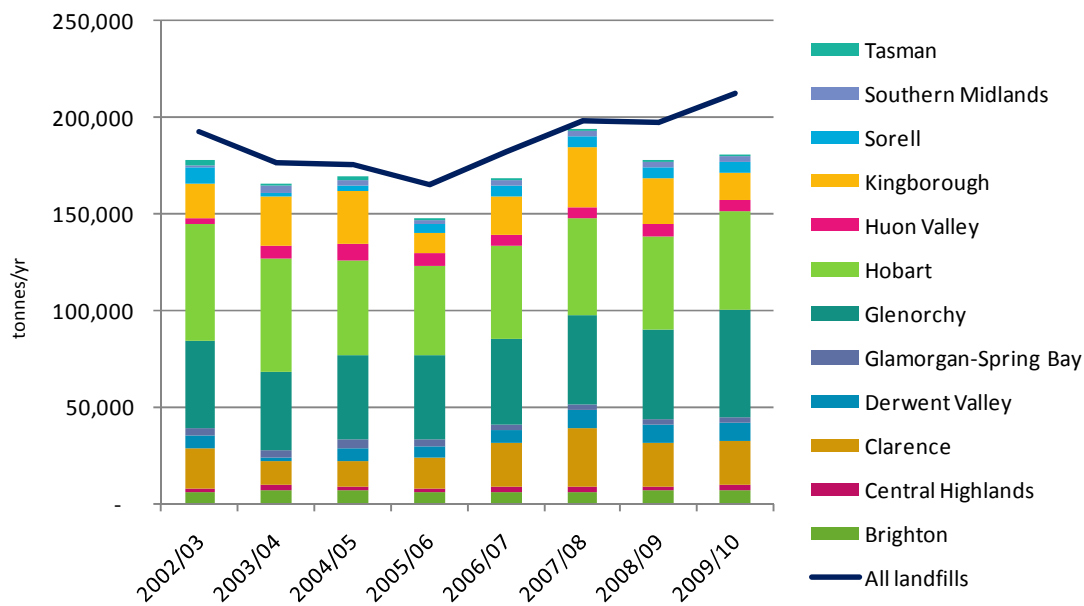
Member councils have identified opportunities for improvement in SWSA management, governance and funding. SWSA also faces increasing waste challenges arising from implementation of the Tasmanian Government's *Tasmanian Waste and Resources Management Strategy* and the Commonwealth Government's *National Waste Policy*. Other drivers for change include the increasing costs of waste management and recycling, the potential introduction of a carbon price to cover greenhouse gas emissions from landfills and higher community expectations of environmental protection.

Current Waste Practices

In 2009/10 around 340,000 tonnes of waste was generated in southern Tasmania, of which around 124,000 tonnes was recovered for reuse or recycling, and 216,000 tonnes was deposited to the five landfills in the region. Around 65% of the waste was generated by the commercial and industrial (C&I) sector (including construction and demolition waste), with around 35% generated by the municipal sector (mainly domestic garbage).

On a per capita basis, southern Tasmania generates around 1,400 kg/person/year of waste from all sources (municipal, C&I and C&D), although the generation rates may be higher or lower in different municipalities. The amount of landfilled waste generated in each municipality is shown in Figure ES1. This includes (shown as a line) waste deposited at Copping landfill, which is not part of SWSA arrangements. The graph shows that SWSA initiatives to date have had limited success and the overall trend is increasing waste generation in southern Tasmania.

Figure ES1 Landfilled Waste 2002/03 – 2009/10



Approximately 89% of households in southern Tasmania are serviced by kerbside garbage collections, while 85% receive kerbside recycling services. The recycling collection services are not uniform across the region; one municipality provides no service and other municipalities do not collect the full range of materials collected in other council areas. Some municipalities use recycling crates which are not the optimum method for maximising diversion or minimising litter.

Additional recovery activities currently carried out in the region include composting of garden organics, diversion of materials such as metals, concrete/bricks and oil, and segregation of items for repair and reuse at resale centres. However recovery rates across the region are generally low.

Strategic Directions

Waste management and resource recovery faces a number of geographic, economic, demographic, market and political challenges in southern Tasmania, but industry practice and trends implemented elsewhere show there are opportunities for improvement. Assessment of the applicability of key industry trends to southern Tasmania, combined with local research and stakeholder consultation, determined the following strategic directions be adopted:

- Regional waste management:** A regional waste management group is the preferred management system in southern Tasmania, however there are changes needed to the management structure of SWSA for it to fit the role member councils wish it to play in the future.
- Waste levy:** Rather than the current voluntary levy, SWSA funding would be more sustainable and equitable with the introduction of a state government waste levy paid by landfill users. It would provide better targeting of users of all landfills in southern Tasmania (including Copping landfill), provide financial incentive to recover and recycle materials, and facilitate development of better infrastructure and innovative local waste solutions.

- **Resource recovery authority:** Establishment of a joint state/local government initiated resource recovery authority offers an optimum structure to deliver on statewide strategies, undertake research and development, and fund infrastructure and recovery programs. Early engagement by local government with state government to develop this structure will provide long term focus on issues of concern to local government.
- **Waste minimisation:** Waste minimisation has the potential in the long term to make a significant impact on the amount of waste generated, particularly cleaner production by industry. However interstate experience shows that long term consistent communication and education is required before any achievement can be measured. SWSA and member councils can provide leadership to the community through a range of waste minimisation activities which influence behaviour and consumption patterns.
- **Collection systems:** Kerbside collection services for garbage are well established, but improvements could be made to recycling services to extend the service to all councils in southern Tasmania, improve recovery rates through the use of mobile garbage bins instead of crates, and make the type of materials collected uniform by expanding the range of materials collected in some council areas. The recycling collection service could be offered to small to medium businesses in urban areas. There is also potential for a bin-based collection service of garden organics on a voluntary or user pays basis in urban areas; this may be expanded to include food organics in the future. Reduced contamination and increased diversion may be achieved through continuing community education programs.
- **Waste data:** There are gaps in recorded data in southern Tasmania, both on the amount and source of generation of waste and on the amount and type of materials recovered. Council contracts should address regular provision of this information by contractors; information could then be provided by councils to SWSA for recording in a regional database. While weighbridges will give the most accurate data by weight, a regime of regular volumetric surveys of landfills will improve on current data at small landfills where installation of weighbridges is not economically feasible at present. Additional data on the composition of domestic garbage could be gathered by a series of regional waste and recycling audits.
- **Industry:** There is a lack of communication between local government and the C&I sector on waste and recycling issues. Potential opportunities for waste minimisation and resource recovery should be explored through an ongoing collaborative approach.
- **Greenhouse emissions:** Methane from landfills contributes to greenhouse gas emissions and may be included in the Commonwealth Government's proposed carbon pricing scheme. Carbon costs and other greenhouse policies will exert pressure on waste arrangements to separate inert waste from putrescible waste, process organic waste and consolidate landfills to a scale at which collection and oxidisation of methane is viable.
- **Waste treatment & processing:** Large scale 'high tech' waste treatment technologies are not considered feasible in southern Tasmania, however there may be viable opportunities for composting of food and garden organics. This may involve using existing composting facilities, establishing a regional facility or a number of smaller sub-regional facilities.

- Infrastructure:** There will be continuing need for landfill disposal at some level in southern Tasmania and facilities should be available to meet this future need without oversupplying airspace. There is potential for rationalisation of some landfills in the region, although this would be subject to further detailed investigation of site, airspace, transport and cost issues. There is potential for optimising use of transfer stations through increased recovery, increased waste compaction and operation of resource recovery centres in accordance with best practice guides.

Vision

The vision for SWSA is to help deliver a sustainable community in southern Tasmania through strategies which minimise waste and optimise resource recovery. By 2020 the goal is for southern Tasmania to be more efficient in materials use, have reduced waste generation, and to reuse, recover and/or recycle the majority of the waste it produces. The strategic directions outlined above provide for the achievement of this goal.

Recommendations

Recommendations on governance and a proposed implementation timetable are shown in Figure ES2. These include internal actions to enhance SWSA corporate governance structures, performance and reporting mechanisms.

The establishment of a resource recovery authority and statewide waste levy (in collaboration with the state government) is also recommended as the option which would deliver best strategic focus and a more sustainable funding system. The levy would apply to all landfill users in accordance with the ‘user pays’ principle.

There is a narrow window of opportunity open to local government to engage with the state government and develop a preferred approach. The failure of local government to act in this timeframe leaves it open to the risk of unilateral state government decisions on waste management which may not adequately address local government issues. Discussions with the state government, other regional waste management groups and other interested parties should therefore commence immediately.

Figure ES2 Recommendations - Governance

Action	Implementation timetable		
	0-3 months	3-6 months	6-12 months
Initiate discussions with state government, other WMGs and LGAT relating to the potential establishment of a joint recovery authority funded by a statewide waste levy			
Develop a charter of corporate governance which expands the functions and responsibilities of SWSA			
Amend reporting and management systems to reflect expanded responsibilities of SWSA			
Consider opportunities for introducing skills-based board members and industry representatives to SWSA board			
Develop a new strategic plan once revised funding and management arrangements are determined			

Recommendations on waste management programs and initiatives are provided in Figure ES3. Implementation is planned in the short, medium and long term.

Figure ES3 Recommendations – Waste Management

Action	Implementation timetable		
	1-3 yrs	3-10 yrs	> 10 yrs
Influencing Behaviour			
Advocate and encourage less wasteful consumption patterns in partnership with WMGs and state government			
Provide continual direction to the community on materials that can be recycled			
Provide feedback to the community on the end-products of materials recovered			
Establish a community education program addressing the need for increased waste management costs			
Consider development of a green purchasing policy for implementation by councils			
Consider implementation of a requirement for planning applications for large developments to include a waste minimisation & management plan			
Consider options for councils to implement minimisation incentives in waste charging mechanisms			
Establish a program of regular meetings with staff and board members of Northern Tasmania WMG and Cradle Coast WMG			
Establish a system for regular consultation with industry stakeholders and maintain on-going liaison			
Consider establishment of an industry waste network			
Maintain waste/recovery industry knowledge and share information with member councils			
Management Systems			
Conduct regular waste & recyclables audits across the region			
Ensure waste management contractors provide regular reports to councils on the volume & type of recyclables collected from kerbside services			
Establish a regional database on the amount of waste landfilled, recyclables collected & materials diverted at council facilities			
Consider aligning contract expiry dates to allow future consideration of regional or sub-regional contracts for kerbside collection services			
Resource Recovery			
Expand kerbside recyclables services to incorporate MGBs at all councils (including Huon Valley)			
Expand materials collected to include plastics 1-7 and paper, cardboard and liquid paperboard at all councils			
Consider provision of MGB-based garden organics collection service in urban areas			
Consider expansion of garden organics collection to include food organics			
Consider extending domestic recyclables service to SMEs			
Consider options for recovering additional materials at RRCs			
Continue support of resale centres			

Action	Implementation timetable		
	1-3 yrs	3-10 yrs	> 10 yrs
Maintain industry knowledge of resource recovery trends and opportunities and share information with member councils			
Develop a policy position on national waste issues (such as proposed product stewardship schemes, greenhouse emissions, hazardous waste management) to allow active engagement in discussions			
Explore opportunities & assess feasibility of recovery and processing of C&D waste			
Identify major C&I waste streams and consider developing response strategies in association with relevant industry associations			
Infrastructure			
Assess landfills and resource recovery centres against best practice to benchmark current practices and identify opportunities for improvement			
Consider options to reduce greenhouse emissions from landfills			
Maintain knowledge of industry trends in WTTs			
Assess potential to direct additional organics to compost facilities at Hobart, Oatlands & Kingborough			
Consider options for development of regional and/or sub-regional organics processing facilities			
Undertake regional landfill investigation to assess airspace requirements & availability, transport & greenhouse costs, & potential rationalisation			

1. INTRODUCTION

Blue Environment Pty Ltd was commissioned by the Southern Waste Strategy Authority (SWSA) to undertake a review of waste management practices of local government in southern Tasmania. The objective of the review is to develop a coordinated vision for solid waste management across the twelve councils in southern Tasmania which are members of SWSA.

The scope of the review is to consider current waste management arrangements and governance, national and state waste policies and the impact these are likely to have on local government, and relationships between private, local, state government and national waste management activities. Within this scope, the review examines potential governance structures, funding arrangements and additional waste management activities that should be undertaken to deliver an environmentally sustainable waste management strategy for the southern Tasmanian region.

The review involved:

- analysis of waste management data provided by southern Tasmanian local governments
- assessment of existing governance structure and funding arrangements
- meetings with relevant officers and councillors from SWSA member councils
- meetings and/or discussion with other relevant stakeholders
- identification of Australian and New Zealand governance and funding arrangements
- research of other Australian and international waste management trends and technologies
- assessment of options for waste management and governance in the region
- development of a vision for waste management in 2020 and beyond.

The project involved analysis of data on existing waste management practices, research on industry trends and governance models, and consultation with a wide range of stakeholders (including face-to-face meetings with all SWSA member councils and a number of key organisations). A list of stakeholders consulted during development of this report is provided in Appendix A.

2. WASTE MANAGEMENT FRAMEWORK

This section outlines the government policy and management framework for waste in the southern region of Tasmania.

2.1 Southern Waste Strategy Authority

The Southern Waste Strategy Authority (SWSA) is a local government authority established in 2001 under the *Local Government Act 1993*. SWSA is comprised of 12 member councils located in southern Tasmania:

- Brighton Council
- Central Highlands Council
- Clarence City Council
- Derwent Valley Council
- Glamorgan Spring Bay Council
- Glenorchy City Council
- Hobart City Council
- Huon Valley Council
- Kingborough Council
- Sorell Council
- Southern Midlands Council
- Tasman Council.

Each council nominates one representative who has the right to vote on SWSA proposals. SWSA employs two staff members.

According to the rules developed at its inception, the purpose of SWSA is to 'facilitate integrated regional strategic planning and implementation of the *Southern Waste Management Strategy*'. Its function is 'to provide the most cost effective management and facilitation of municipal waste minimisation programs, waste stream control and performance monitoring, establishment of a non-municipal waste minimisation program, monitoring of residual waste treatment technologies, infrastructure developments, implementation of the landfill development strategy, education and marketing programs'.

A map of the member councils that comprise SWSA is shown in Figure 2.1.

Figure 2.1 Map of SWSA Member Councils



Source: LGB (undated)

Funding

SWSA member councils currently voluntarily pay a nominal fee equivalent to \$2 per tonne on waste deposited at their landfills to fund SWSA operations. Where member councils do not have a landfill or do not operate a weighbridge at their landfill (and therefore find it difficult to determine the weight of waste deposited), fees are calculated based on their population and an agreed rate per resident. This rate is currently calculated at 0.45 tonnes per person where there are transfer stations and 1 tonne per person where landfills operate.

The \$2 per tonne equivalent levied on member councils has been subsidised by external grants obtained by SWSA (e.g. through the former National Packaging Covenant). These additional funds have meant that member councils have not been required to pay the full \$2 per tonne levy until 2010/11; the fee ranged from \$1.18 per tonne in 2002/03 to \$1.70 in 2009/10.

The actual member contributions for 2010/11 are shown in Table 2.1.

Table 2.1 SWSA Member Contributions 2010/11

Council	\$
Brighton	\$ 14,146
Central Highlands	1,846
Clarence	46,076
Derwent Valley	8,476
Glamorgan-Spring Bay	5,070
Glenorchy	109,364
Hobart	88,890
Huon Valley	11,900
Kingborough	26,884
Sorell	11,186
Southern Midlands	2,534
Tasman	2,070
Total	\$ 328,442

These contributions are based only on the waste managed directly by SWSA member councils; they do not encompass waste deposited at Copping landfill or industrial and/or controlled waste which is managed on-site or directed to other facilities (e.g. treatment facilities, mainland states).

Current Strategy

The *Southern Waste Strategy Authority Five Year Strategy 2006-2011* (SWSA 2005) documents the current strategy of SWSA. In updating the strategy in 2005, SWSA’s focus changed from the quantity of waste landfilled to the value of resources recovered. The strategy outlines the following objectives:

- encourage the maximum extent of sustainable resource recovery from all waste streams in southern Tasmania
- contribute to a consistent policy and planning environment within the state by clarifying the roles and responsibilities of state vs. local government with respect to solid waste management
- minimise adverse impacts on the environment and the community arising from local government waste management activities.

To achieve these objectives, the document outlines future strategies and actions as shown in Table 2.2.

Table 2.2 2006-2011 Strategies of SWSA

Strategy	Planned actions
Public awareness	<ul style="list-style-type: none"> ▪ conduct a consumer perception survey prior to reviewing future priorities for public awareness programs ▪ place greater emphasis on monitoring, evaluation and progressive refinement of public awareness programs
Performance monitoring	<ul style="list-style-type: none"> ▪ place more emphasis on monitoring the extent of resource recovery ▪ encourage the development of a voluntary system of data collection on waste quantities, waste composition and private sector recycling
Regional policies	<ul style="list-style-type: none"> ▪ quantify the environmental costs/benefits of composting ▪ investigate split recycling collection/sorting contracts
Preferred service guidelines	<ul style="list-style-type: none"> ▪ update preferred service guidelines to reflect improved data and analysis as it becomes available
Non-municipal program	<ul style="list-style-type: none"> ▪ consider C&I demonstration projects ▪ survey C&I waste services available within Tasmania and elsewhere

2.2 Government Policy

Tasmanian Government

The Environment Protection Authority (EPA) was established in 2008 and has statutory responsibilities in environmental assessments, environmental agreements, mandatory environmental audits and environmental improvement programs.

The EPA is supported by the Environment Division of the Department of Primary Industries, Parks, Water and Environment (DPIPWE). The Division is responsible for policies and regulation in relation to sustainable environmental management. It monitors and regulates environmental performance in the Tasmanian community.

The main statutory instrument for environmental protection in Tasmania is the *Environmental Management and Pollution Control Act 1994*. The objectives most relevant to waste management include:

- to protect and enhance the quality of the Tasmanian environment
- to prevent environmental degradation and adverse risks to human and ecosystem health including by reuse and recycling of materials and waste minimisation programs
- to allocate costs of environmental protection and restoration equitably
- to control the generation, storage, collection, transportation, treatment and disposal of waste with a view to reducing, minimising and eliminating harm to the environment
- to promote public education about the protection, restoration and enhancement of the environment.

In June 2009 the Tasmanian Government released the *Tasmanian Waste and Resource Management Strategy* (DEPHA 2009). This strategy established a framework of objectives for solid waste management and resource recovery, including:

- improved partnerships, coordination and planning
- waste avoidance and sustainable consumption
- waste minimisation and resource recovery
- improved regulation and management of residual wastes
- improved data collection and management systems
- reduction of greenhouse gas emissions.

Based on the strategy’s guiding principles (viz. managing waste in line with the waste management hierarchy, environmental stewardship to reduce adverse impacts, the precautionary principle, life cycle assessment and the polluter pays/user pays principle¹), a suite of strategic actions and relevant responsibilities are outlined to address waste management in Tasmania. Those actions which the strategy determines are relevant to local government are outlined below.

Table 2.3 Local Government Responsibilities in Tasmanian Waste Strategy

Sector	Action
Improved partnerships, coordination and planning	<ul style="list-style-type: none"> ▪ establish funding mechanism(s) to deliver the strategy and supporting programs and initiatives ▪ develop working partnerships between state government, local government, regional waste groups, industry and the community to improve coordination of programs and in delivery of the strategy ▪ establish resource sharing arrangements and coordination of an integrated network of resource recovery, waste transfer, treatment and disposal services between regions ▪ develop strategies to address the needs and requirements for new and growing industries and investment and to facilitate improved waste and resource management options ▪ develop and implement action plans to deliver the strategy
Waste avoidance and sustainable consumption	<ul style="list-style-type: none"> ▪ develop and deliver targeted education and awareness programs to promote informed and responsible sustainable consumption behaviours and purchasing decisions and ways to avoid waste ▪ adopt and practice sustainable consumption behaviours and green purchasing policies ▪ promote and facilitate innovation in product design and manufacture that encourages product longevity and waste avoidance ▪ develop and implement systems to encourage and provide incentives for waste avoidance in the broader community
Waste minimisation and resource recovery	<ul style="list-style-type: none"> ▪ develop and deliver educational programs, guidance and services to enable and promote waste minimisation, resource recovery and recycling ▪ develop policies and deliver services and programs which stimulate investment in technologies, facilities and systems to promote resource recovery and

¹ Refer to Section 5.1 for further explanation of guiding principles

Sector	Action
	<p>reduce the disposal of resources to landfill</p> <ul style="list-style-type: none"> ▪ develop economic and legislated instruments to reduce waste generation and divert waste from landfill ▪ where appropriate, require industries and major new developments to develop waste minimisation and resource recovery plans ▪ develop collaborative strategies with the C&D and C&I sectors to reduce the amount of waste deposited to landfill from these sectors ▪ create and support local markets for resource recovery through implementation of appropriate purchasing practices ▪ undertake relevant market research to identify suitable opportunities for local development (e.g. alternative treatment technologies) and improvement/extension of existing services and facilities ▪ participate in the National Packaging Covenant in the reduction of excess packaging ▪ participate in and support the development of extended producer responsibility and product stewardship programs
Improved regulation and management of residual waste	<ul style="list-style-type: none"> ▪ identify priority areas for improved waste management practices ▪ develop and implement waste-specific, industry-specific and/or region-specific guidelines, policies, strategies and action plans to employ best practice management practices for residual wastes ▪ facilitate the development of infrastructure and best practice facilities to meet Tasmania’s waste and resource management needs ▪ strengthen regulatory systems and employ improved mechanisms to identify and appropriately investigate non-compliant waste practices ▪ employ best practice waste management for all activities ▪ reward businesses committed to sustainable resource management and improved environmental outcomes ▪ support and facilitate range of national programs for waste such as the product stewardship arrangements for waste oil and for end-of-life tyres
Data collection and management systems	<ul style="list-style-type: none"> ▪ establish a coordinated approach and implement systems for data collection and management, setting targets, measuring performance and public reporting ▪ facilitate and regulate relevant data collection from industry ▪ continue to participate in and support national data collection systems and utilise results for waste and resource management planning
Reduction of greenhouse gas emissions	<ul style="list-style-type: none"> ▪ develop, participate in and support national, state and local schemes and programs that lead to a reduction in greenhouse gas emissions through improved waste management and enhance resource recovery ▪ review and amend procurement policies to ensure waste reduction and climate change considerations are incorporated into purchasing decisions ▪ review waste management practices that generate greenhouse gas emissions and develop waste minimisation and management plans to reduce emissions ▪ increase the diversion of organic waste from landfill and develop policies for alternative management of organic wastes.

The Waste Advisory Committee (WAC) was established in 2009 as an outcome of the *Tasmanian Waste and Resource Management Strategy*. The role of WAC is to oversee implementation of the strategy, report on progress and achievements of the strategy and provide relevant recommendations to the state government. WAC is assisted in this by the EPA.

In recent times the Department of Economic Development has played a role in the management of controlled waste. In particular, it facilitated (in conjunction with the former Department of Tourism, Arts and the Environment) the development of the *Draft Current and Future Controlled Waste Practices in Tasmania* (SIA January 2008). This report involved a business case and feasibility study for controlled waste management facilities in Tasmania. It determined that lack of regulation and enforcement of controlled waste requirements were the most significant barrier to improving controlled waste management practices and standards and encouraging investment in new and existing infrastructure. The draft report made a number of recommendations including:

- the application of clear and consistent regulation
- development of a guide to provide advice to controlled waste generators
- implementation of a program of controlled waste audits and plans to encourage improvement by generators (including industry-specific plans)
- more effective cooperation between state and local government.

Commonwealth Government

The Commonwealth Government released the *National Waste Policy: Less Waste, More Resources* in November 2009. This policy established an Australian waste framework over the next 10 years with the following aims:

- to avoid the generation of waste, reduce the amount of waste (including hazardous waste) for disposal, manage waste as a resource and ensure that waste treatment, disposal, recovery and re-use is undertaken in a safe, scientific and environmentally sound manner
- to contribute to the reduction in greenhouse gas emissions, energy conservation and production, water efficiency, and the productivity of the land.

To deliver on these aims, the National Waste Policy outlines strategies around the following issues:

- voluntary, co-regulatory and regulatory product stewardship and extended producer responsibility schemes to provide for the impacts of a product being responsibly managed during and at end of life
- sustainable procurement principles and practices
- better management of packaging to improve the use of resources, reduce the environmental impact of packaging design, enhance away from home recycling and reduce litter
- the introduction of a national definition and classification system for wastes
- agreed national principles, guidelines and standards to remove impediments to effective markets for potential wastes
- access to knowledge and expertise in sustainable procurement and business practices
- reducing the amount of biodegradable material sent to landfill
- management of the health and safety risks arising from landfill gas emissions
- measures to address emissions from disposal of waste to landfills and other waste activities
- major improvements in waste avoidance and reuse in key areas of the C&I waste stream
- best practice waste management and resource recovery for C&D projects

- meeting international obligations around hazardous waste management
- reducing hazardous substances in products sold in Australia
- building capacity in regional and remote waste management and resource recovery (including an audit of existing waste infrastructure in remote indigenous communities)
- periodic publication of accurate data on waste and resource recovery.

The Environment Protection and Heritage Council (EPHC) of Australia and New Zealand was established in 2001 by the Council of Australian Governments. EPHC addresses national policy issues relating to environmental protection and through National Environment Protection Measures (NEPMs) outlines agreed national objectives for protecting or managing aspects of the environment.

There are currently two waste NEPMs: Movement of Controlled Waste between States and Territories, and Used Packaging Materials. Further investigative work was carried out by EPHC on a proposed NEPM on product stewardship, however this has been overtaken by proposed product stewardship agreements between government and industry regarding specific products such as end-of-life tyres, televisions and computers. Investigations have also been undertaken regarding plastic bags and beverage containers, although no arrangements have been agreed.

2.3 Other Government Authorities

Southern Tasmanian Councils Authority

The Southern Tasmanian Councils Authority (STCA) is a local government authority with the same member councils as SWSA. The organisation facilitates cooperative partnerships and enables its member councils to take joint action to address regional development issues and progress sustainable economic, environmental and social outcomes in southern Tasmania. STCA outlines its priorities as:

- improved physical infrastructure
- enhanced economic development
- improved environmental performance
- enhanced social well-being
- improved inter-regional cooperation.

While it recognises its role in environmental performance, it takes no responsibility for waste management.

Copping Refuse Disposal Site Joint Authority

The Copping Refuse Disposal Site Joint Authority is a local government authority which was established in 2001 by the Sorell, Tasman and Clarence City Councils (Kingborough Council subsequently joined in 2009). It was established to develop and operate the Copping landfill; the rules of the authority commit the participating councils to use Copping landfill as their principal waste disposal facility. Southern Waste Solutions is the trading name of the authority.

In addition to the Copping landfill, the authority has established a transfer station and clinical waste treatment plant at Derwent Park Road, Lutana.

The authority is currently exploring two other potential waste opportunities:

- a waste remediation project using contaminated soil
- development of a Category C cell at the Copping landfill to accept Controlled Waste.

Northern Tasmania Waste Management Group

The Northern Tasmania Waste Management Group (WMG) was formed in 2008 as a committee of the Northern General Managers Group; through Northern Tasmania Development, it represents 8 councils in the north of the state:

- Break O'Day
- Dorset
- Flinders
- George Town
- Launceston
- Meander Valley
- Northern Midlands
- West Tamar.

The 3 year regional agreement among the councils expired in June 2010 and was recently extended for a further 3 year term (until 2013).

The *Northern Tasmanian Regional Waste Management Strategy, Five Year Strategy 2009-2013* (Dulverton Waste Management, January 2009b) was developed on behalf of the Northern Tasmania WMG. To achieve its goals, the strategy documents a number of strategies as follows:

- long term management of putrescibles and organic waste
- provide education and feedback to the community
- reduce C&I and C&D waste to landfill
- exploit funding opportunities at federal and state level
- understand and mitigate the potential impact of climate change
- support the development of waste management policies, guidelines and procedures relevant for the region
- regional planning of waste service delivery and infrastructure to achieve continuity and efficiencies in economies of scale
- benchmarking of landfill performance (best practice)
- regional focus on emerging waste streams (e-waste, batteries, fluoro tubes, tyres).

To deliver on these strategies, a fee of \$2 per tonne (based on landfilled waste) is levied on member councils. In 2009/10 this generated an income of approximately \$286,850, indicating the region landfilled around 143,500 tonnes of waste (or around 32% of landfilled waste in Tasmania).

Cradle Coast Waste Management Group

The Cradle Coast Authority is a local government authority established to coordinate and drive economic development in the nine councils in the north west region:

- Burnie
- Central Coast
- Circular Head
- Devonport
- Kentish
- King Island
- Latrobe
- Waratah Wynyard
- West Coast.

The Cradle Coast WMG was established in 2004 as a committee of the Cradle Coast Authority Board. Membership of the group is skills-based. The intent of the Cradle Coast WMG was not to become involved in day-to-day waste management activities, but to focus on providing a consistent regional approach and be a conduit for dialogue with other stakeholders.

A fee of \$2 per tonne of landfilled waste is levied on member councils, with the exception of King Island and West Coast councils. The latter two councils do not pay a fee but have access to work undertaken under the regional strategy and are able to contribute to projects that meet their needs. The Cradle Coast WMG manages regional waste strategy revenues and expenditure and provides administration support and coordination of projects.

The *Cradle Coast Authority Regional Waste Management Strategy - Five Year Strategy 2009-2013* (Dulverton Waste Management January 2009a) was developed to deliver improvements in waste reduction and resource recovery, regional cooperation and coordination, waste management policy and service delivery, and community education and marketing. Dulverton Waste Management administers the strategy and related projects.

According to the strategy, approximately 91,250 tonnes of waste is deposited at landfills in the Cradle Coast region (or around 20% of landfilled waste in Tasmania). Based on the \$2 per tonne levy, total fees of around \$160,000 per year are available to implement the initiatives outlined in the strategy:

- improve economics and effectiveness of recyclables collection and handling
- long term management of putrescible waste
- understand and mitigate the potential impact of climate change
- regional focus on emerging waste streams (e-waste, batteries, fluoro tubes, tyres)
- understand the region's waste management economics and trends
- reduction of C&I and C&D waste to landfill
- support the development of waste management policies, guidelines and procedures relevant to the region
- provide community education and feedback
- exploit funding opportunities at federal and state level.

Comparison with the strategies included in the *Northern Tasmanian Regional Waste Management Strategy, Five Year Strategy 2009-2013* (Dulverton Waste Management, January 2009b) above shows there is little difference between the stated focus of the Northern Tasmania and Cradle Coast waste groups.

Dulverton Waste Management

Dulverton Waste Management is a local government authority established by the Central Coast, Devonport, Kentish and Latrobe Councils. The organisation operates a landfill and organics processing facility at Railton.

Dulverton Waste Management was commissioned by both the Northern Tasmania and Cradle Coast groups to develop their respective regional waste management strategies. It has an ongoing role with administering and implementing the strategies. It is understood that one of its employees also works part-time for Launceston City Council and there is consequently an exchange of information via Launceston with the Northern Tasmania WMG.

Local Government Association of Tasmania

The Local Government Association of Tasmania (LGAT) represents councils across Tasmania, excluding Glenorchy City Council (which resigned its membership). LGAT has documented a number of policy positions on waste management and resource recovery; these include the following principles:

- 'user pays' and 'polluter pays' principles should apply
- state government should assist with identifying markets for recycled products, provision of recycling guidance and expertise, and instigation of public education programs
- state government should provide adequate resources for waste management
- acknowledges the benefits of life cycle accounting and will endeavour to apply it where practicable
- strongly committed to economically, environmentally and socially sustainable recycling schemes
- supports the removal of regulatory barriers to sustainable recycling
- favours phased implementation of improved standards of landfill management
- strongly opposes the introduction of a waste management disposal levy.

2.4 Other Stakeholders

There is a range of other stakeholders with an interest in waste management in southern Tasmania.

Veolia Environmental Services (Australia) Pty Ltd is a large multinational waste management company. It has a number of collection and transport contracts with councils across Tasmania, and operates material recovery facilities (MRFs) in Derwent Park and Invermay and a paper/cardboard recycling facility in Spreyton. There are other smaller waste management contractors (such as Aussie Waste and Thorp Waste) who service local government as well as contracting to local businesses and industry.

The business/industrial sector is responsible for generating large amounts of C&I and C&D waste and has an economic and logistical interest in improving waste management and resource recovery services. This interest may be espoused individually by large companies or through collective business organisations (such as chambers of commerce).

The community has a social, environmental and economic interest in sustainable waste management and resource recovery; while some environmental organisations express their collective views, the majority of the community rely on local government processes to deliver on their waste management and resource recovery needs.

3. CURRENT WASTE MANAGEMENT PRACTICES

This section outlines the current waste management infrastructure and services provided by SWSA member councils. It includes data on the amount of waste and recyclables generated, as well as existing or planned initiatives at council level.

3.1 Infrastructure and Services

The approach to waste management differs across the 12 SWSA member councils. Services provided by each council are discussed below, including existing infrastructure and planned waste management and recovery strategies.

Brighton

Brighton Council provides the following waste services:

Landfills	-
Transfer stations	Bridgewater
Kerbside collections	Garbage: 240 L MGB collected fortnightly (by Veolia under contract expiring 2015) Recycling: 240 L MGB collected fortnightly (by Aussie Waste Management under contract expiring 2015) Hard waste & garden organics: collected every 2 months
Other services	-

The comingled recycling service allows for collection of the following materials:

- paper/cardboard
- liquid paperboard
- glass bottles/jars
- steel & aluminium cans
- plastics 1 – 7.

Steel, oil, tyres, batteries and comingled recyclables are separated at the Bridgewater transfer station for recovery. The drumMUSTER program for collection of agricultural chemical containers also operates at the transfer station.

Council will shortly undertake a review of the operations of Bridgewater transfer station. Brighton is experiencing population growth and significant development, and the location and facilities of the transfer station (established in 1986) will be assessed for its adequacy in meeting future needs.

Central Highlands

Central Highland Council provides the following waste services:

Landfills	Hamilton
Transfer stations	Arthurs Lake, Bothwell, Bronte Park, Miena
Kerbside collections	Garbage: 140 L MGB collected weekly (by Thorp Waste under contract expiring 2012) Recycling: 50 L crate collected fortnightly (by Ken Thorpe under contract expiring 2012) Hard waste: collected annually (by council)
Other services	Roadside skip bins in highland/central lakes area (waste collected by Veolia) Public place recycling (collected by council)

The comingled recycling service allows for collection of the following materials:

- paper/cardboard
- liquid paperboard
- glass bottles/jars
- steel & aluminium cans
- plastics 1 – 3.

Roadside skip bins for the deposition of waste generated by the seasonal population in the highland/central lakes area have recently been introduced. Continuation of the service is subject to their satisfactory use (e.g. litter, contamination issues) and will be considered by council in the future.

Jones Waste Management services the bins from the council transfer stations. There is also a private transfer station at Wayatinah.

Hamilton landfill has an expected lifespan of at least 20 years. Council intends to seek an extension to the landfill in the future to maintain a disposal facility within an economic transport distance of their residents.

Clarence

Clarence City Council provides the following waste services:

Landfills	Part ownership of Copping landfill
Transfer stations	Mornington Park
Kerbside collections	Garbage: 80 L MGB collected weekly (by Veolia under contract expiring 2013) Recycling: 140 L MGB collected fortnightly (by Veolia under contract expiring 2013) Organics: Bundled and crate up to 2 m ³ collected monthly (by Veolia under contract expiring 2013) Hard waste: annual booked collection (by Veolia under annual contract)
Other services	Public place recycling bins (collected by Veolia under annual contract)

Clarence's comingled recycling service allows for collection of the following materials:

- paper/cardboard
- liquid paperboard
- glass bottles/jars

- steel & aluminium cans
- plastics 1 – 7.

Derwent Valley

Derwent Valley Council provides the following waste services:

Landfills	New Norfolk
Transfer stations	National Park
Kerbside collections	Garbage: 120 L MGB collected weekly (by Veolia under contract expiring 2015) Recycling: 50 L crate collected weekly (by Veolia under contract expiring 2011)
Other services	-

The comingled recycling service allows for collection of the following materials:

- paper/cardboard
- liquid paperboard
- glass bottles/jars
- steel & aluminium cans
- plastics 1 – 3.

Waste oil, concrete, metals, glass and plastics are accepted for recycling at the New Norfolk landfill; the transfer station accepts whitegoods, steel and glass for recycling. Garden organics can be dropped off at both the landfill and transfer station; the material is chipped and re-used for rehabilitation works at New Norfolk landfill.

Waste deposited at the National Park transfer station is transported each month to the New Norfolk landfill for disposal. At the current rate of filling (around 14,000 tonnes per year), the landfill has an estimated lifespan of over 20 years.

Glamorgan Spring Bay

Glamorgan Spring Bay Council provides the following waste services:

Landfills	-
Transfer stations	Bicheno, Coles Bay, Orford, Swansea
Kerbside collections	Garbage: 120 L MGB collected weekly (by Veolia under contract expiring 2015) Recycling: 120 L MGB collected fortnightly (by Veolia under contract expiring 2015)
Other services	Public place recycling (collected by council)

The comingled recycling service allows for collection of the following materials:

- paper/cardboard
- liquid paperboard
- glass bottles/jars
- steel & aluminium cans
- plastics 1 – 7.

The transfer stations have provision for separation of garden organics, metal and oil. The garden organics are burnt under licence from DPIPW; metals and waste oil are collected each year for recycling.

Council are considering establishing a compactor at Orford transfer station; this would be used to compact waste and reduce the number of trips to Copping landfill (also reducing transport costs).

Glenorchy

Glenorchy City Council provides the following waste services:

Landfills	Jackson Street, Glenorchy
Transfer stations	-
Kerbside collections	Garbage: 140 L / 240 L MGB collected fortnightly, some units weekly (by Veolia, new contract in process) Recycling: 140 L / 240 L MGB collected fortnightly, some units weekly (by Veolia under contract expiring 2012)
Other services	Public place recycling (collected by council)

The comingled recycling service allows for collection of the following materials:

- paper/cardboard
- liquid paperboard
- glass bottles/jars
- steel & aluminium cans
- plastics 1 – 7.

The Jackson Street landfill has an expected lifespan of around 22 years (in 2032) at current rates of filling. However council expects the demands of complying with future best practice standards may see the landfill close earlier than that. The landfill has a methane extraction system in place for generation of electricity.

A repair and resale centre operates at the landfill; operation is contracted by council to Recovery (Tasmania) Pty Ltd. Other material segregated for recovery at the landfill includes metals, concrete/bricks and oil.

In conjunction with Hobart City Council, Glenorchy jointly owns a site in Derwent Park Road, Lutana which is intended for future development as a waste management facility. The site is currently leased to Southern Waste Solutions, which operates a clinical waste treatment and transfer station facility at the site.

Hobart

Hobart City Council provides the following waste services:

Landfills	McRobies Gully, Hobart
Transfer stations	-
Kerbside collections	Garbage: 120 L MGB collected weekly (by council) Recycling: 240 L MGB collected fortnightly (by council) Organics: tied bundle up to 2 m ³ twice yearly (by Veolia under contract expiring 2011) Hard waste: annually up to 2 m ³ (by Spectran under contract expiring 2011)
Other services	Public place recycling (collected by council)

The comingled recycling service allows for collection of the following materials:

- paper/cardboard
- liquid paperboard
- glass bottles/jars
- steel & aluminium cans
- plastics 1 – 7.

The *Draft Strategic Operating Plan, McRobies Gully Waste Management Centre 2010-2015* (Hobart City Council, undated) examines the current activities at the McRobies Gully landfill and outlines potential options for future operations. Each year the McRobies Gully landfill receives around 50,000 tonnes of putrescible waste. At the current rate of filling, the landfill will reach its end of life in approximately 6 years (2017).

A composting operation is carried out at the landfill site, processing around 10,000 tonnes of garden and organic waste each year into saleable product. A recyclables drop-off area accepts around 1,500 tonnes each year of paper, cardboard, glass, plastic, batteries, concrete, tyres, metal and oil for re-processing. A resale shop is operated by Resource Work Cooperative Society Ltd at the landfill site; it recovers around 1,000 tonnes of material each year for repair and reuse. Methane from the landfill is collected and used for generation of electricity.

Proposed future initiatives at McRobies Gully landfill include:

- the redevelopment of the resource recovery centre at McRobies Gully landfill (this would direct all light vehicles through the centre prior to other waste drop-off areas, and optimise the recovery of materials)
- relocation of weighbridge (to enhance data recording and user charging systems)
- development of a transfer station
- alternative access route
- continued rehabilitation works.

Council may also consider using the landfill in future as an inert landfill, i.e. accept only inert waste (such as concrete, bricks, etc) thereby extending the life of the landfill airspace.

In conjunction with Glenorchy City Council, Hobart jointly owns a site in Derwent Park Road, Lutana which is intended for future development as a waste management facility. The site is currently leased to Southern Waste Solutions, which operates a clinical waste treatment and transfer station facility at the site.

The *Draft Waste Management Strategy 2010-2015* (Hobart City Council, undated) sets out 8 goals for future waste management in Hobart:

- provide effective and efficient waste management services
- provide high quality waste disposal infrastructure
- rehabilitate McRobies Gully landfill site and plan for post-closure management
- minimise waste to landfill
- reduce the environmental impact from waste management activities
- develop regional and strategic partnerships
- promote waste management and minimisation
- ensure waste management services are sustainable through innovation and improvement.

A large number of actions are proposed across the 5 year life of the strategy to deliver on the objectives.

Huon Valley

Huon Valley Council provides the following waste services:

Landfills	-
Transfer stations	Cygnet, Dover, Geeveston, Southbridge
Kerbside collections	Garbage: 120 L MGB collected weekly (by Thorp Waste) No recycling
Other services	-

Materials separated for recycling at the transfer stations include garden organics, timber, metal, e-waste and oil. Domestic recyclables (paper/cardboard, liquid paperboard, glass bottles/jars, steel & aluminium cans, plastics 1-7) are accepted for recycling at Southbridge transfer station. Garden organic waste is chipped. Waste from the kerbside garbage collection and transfer station skips is deposited at Copping landfill under a 20 year contract (expiring in 2020).

Potential future initiatives being considered by council include the following:

- establishment of a resale shop at the Southbridge transfer station
- introduction of a kerbside recycling service
- introduction of an annual hard waste and green waste service.

Kingborough

Kingborough Council provides the following waste services:

Landfills	Part ownership of Copping landfill operations (but not site)
Transfer stations	Barretta (under construction), Bruny Island
Kerbside collections	Garbage: 80 L MGB collected weekly (by Aussie Waste) Recycling: 140 L MGB collected fortnightly (by Aussie Waste)
Other services	-

The comingled recycling service allows for collection of the following materials:

- paper/cardboard
- liquid paperboard
- glass bottles/jars
- steel & aluminium cans
- plastics 1 – 7.

A repair and resale centre (the Kingborough Resource Recovery Centre) is operated by Cerebral Palsy Tasmania at Barretta.

Sorell

Sorell Council provides the following waste services:

Landfills	Part ownership of Copping landfill
Transfer stations	-
Kerbside collections	Garbage: 80L / 140 L MGB collected weekly (by Veolia under contract expiring 2015) Recycling: 140 L MGB collected fortnightly (by Veolia under contract expiring 2015) Organics: tied bundle collected monthly (by Veolia) Hard waste: collected quarterly (by Veolia)
Other services	Recycling centres: Dodges Ferry, Dunalley, Sorell

Sorell’s comingled recycling service allows for collection of the following materials:

- paper/cardboard
- liquid paperboard
- glass bottles/jars
- steel & aluminium cans
- plastics 1 – 3.

The 3 recycling centres accept domestic recyclables only (the same material types as the kerbside comingled collection service). They are unsupervised and council is concerned with the practices of users. Council is currently reviewing the recycling centres and may rationalise the services provided.

Southern Midlands

Southern Midlands Council provides the following waste services:

Landfills	-
Transfer stations	Campania, Dysart, Oatlands
Kerbside collections	Garbage: 120 L / 240 L MGB collected weekly / fortnightly in different areas (by Thorp Waste under contract expiring 2014) Recycling: 65 L crate collected weekly / fortnightly in different areas (by Thorp Waste under contract expiring 2014)
Other services	-

The Southern Midlands comingled recycling service allows for collection of the following materials:

- glass bottles/jars
- steel & aluminium cans
- plastics 1 – 7.

Paper and cardboard is not accepted for recycling; if collected, it is deposited in landfill.

Material separated at the transfer stations for recycling includes domestic recyclables, steel, batteries, oil and garden organics. The organic waste is not processed; council has an EPA licence to burn it.

An open windrow composting facility is operated by a private company (Soil First) at Oatlands, however it does not receive organic waste from Southern Midlands Council.

Tasman

Tasman Council provides the following waste services:

Landfills	Part ownership of Copping landfill
Transfer stations	Nubeena
Kerbside collections	Garbage: 120 L MGB collected weekly (by Thorpes Waste under contract expiring 2010) Recycling: crate collected weekly (by Thorpes Waste under contract expiring 2010)
Other services	-

The comingled recycling service allows for collection of the following materials:

- paper/cardboard
- liquid paperboard
- glass bottles/jars
- steel & aluminium cans
- plastics 1 – 3.

Material separated for recycling at the transfer station includes metals and oil. Garden organics and timber is separated and stockpiled on site.

Other

Copping landfill was established in 2001 and is jointly owned by Clarence, Sorell and Tasman Councils. In 2009 Kingborough Council bought a share of the landfill operations (but not the land); Glenorchy and Hobart Councils were also invited to join but declined the offer. Business operations are carried out under the trading name of Southern Waste Solutions.

The Copping landfill site covers an area of 704 hectares, and consequently the anticipated life of the landfill is long. While Stage 1 is expected to be complete by 2023, the total landfill life may be around 200 years. The landfill has a licence from DPIPWE to accept up to 104,000 tonnes of Category B waste per year. The landfill received over 72,000 tonnes of waste in 2009/10, of which the greatest portion (82%) was from commercial and industrial (C&I) sources. According to Copping landfill records, municipal solid waste (MSW) and construction and demolition (C&D) waste both contributed 9% each; however there is some question about the accuracy of the source data (this is discussed further in Section 3.2).

Southern Waste Solutions also established a clinical waste treatment and transfer station facility at Derwent Park Road, Lutana. Selected medical waste is accepted for shredding and treatment; it is then compacted with general waste accepted at the transfer station and transported to Copping landfill for disposal. The site is owned jointly by Glenorchy and Hobart councils and leased to Southern Waste Solutions.

An open windrow composting operation is carried out at Oatlands by a private company (operating under the name of Soil First). No organic waste is sourced from the 12 member councils in SWSA although discussion with a private waste management contractor (Eenee) indicates that some domestic and commercial collections of food waste in Hobart are taken to the Oatlands facility for processing.

A 12 month composting trial is proposed to be carried out at Barretta by Kingborough Council in 2011. The trial will compost mostly garden organics utilising the static pile composting approach put forward by Groundswell. This approach is also being trialled by some NSW councils; results are not yet known.

Regional Summary

A regional summary of municipal waste infrastructure is shown in Table 3.1.

Table 3.1 Municipal Waste Infrastructure

Council	Landfill	Transfer station	Other
Brighton	-	Bridgewater	
Central Highlands	Hamilton	Arthurs Lake Bothwell Bronte Park Miena	Wayatinah (private transfer station)
Clarence	Part owner of Copping landfill	Mornington Park	
Derwent Valley	New Norfolk	National Park	
Glamorgan Spring Bay	-	Bicheno Coles Bay Orford Swansea	
Glenorchy	Glenorchy	-	Resale shop
Hobart	Hobart	-	Resale shop Compost facility
Huon Valley	-	Cygnets Dover Geeveston Southbridge	
Kingborough	Part owner of Copping landfill operations	Barretta (under construction) Bruny Island	Resale shop Compost facility (under development)
Sorell	Part owner of Copping landfill	-	
Southern Midlands	-	Campania Dysart Oatlands	
Tasman	Part owner of Copping landfill	Nubeena	

The amount of material collected by councils in the southern region is shown in Table 3.2.

Table 3.2 Material Collected 2009/10

Council	Households serviced ¹	Waste collected ²	Recyclables ²	Organics ²	Other ^{2,3}	Total
Brighton	5,211	6,973	N/A	-	N/A	6,973
Central Highlands ⁵	745	905	N/A	-	-	905
Clarence	22,760	8,360	4,700	1,550	1,470	16,080
Derwent Valley	3,400	9,770	600	-	-	9,770
Glamorgan-Spring Bay	2,999	2,712	501	-	N/A	3,213
Glenorchy	19,751	7,723	4,000	-	88	11,811
Hobart	21,000	13,000	4,000	300	1,350	18,650
Huon Valley ⁶	3,740	5,160	-	-	-	5,160
Kingborough	11,316	4,613	2,064	-	N/A	6,677
Sorell	6,400	5,593	1,200	200	-	6,993
Southern Midlands	1,391	2,642	N/A	-	N/A	2,642
Tasman ⁷	1,985	1,035	53	-	N/A	1,088
Region	99,698	68,486	17,118	2,050	2,908	90,562

- Notes:
1. Households with kerbside garbage service; in some areas, fewer households have recycling services
 2. 2009/10 figures advised by councils
 3. Other material from hard waste collections, litter bins, public place recycling
 4. N/A = no data available
 5. Central Highlands figure includes all landfilled waste; amount of kerbside garbage collected unknown
 6. No recyclables collection service provided in Huon Valley
 7. Volumetric figure for recyclables converted using average material density factor

Additional amounts of waste and recyclables are transported directly by generators to landfills operated by SWSA member councils. This is discussed further in Section 3.2.

A summary of services provided by SWSA members is presented in Table 3.3. Where the data are available and relevant, the percentage of households receiving a service is given. These are estimated from data provided by SWSA member councils.

Table 3.3 SWSA Council Services

	Household services				Other services	
	Garbage	Recycling	Organics	Hard waste	Litter bins	Public place recycling
Brighton	74%	74%	✓	✓	✓	-
Central Highlands	34%	34%	-	✓	✓	✓
Clarence	100%	100%	100%	100%	✓	✓
Derwent Valley	99%	99%	-	-	✓	-
Glamorgan-Spring Bay	90%	90%	-	-	✓	✓
Glenorchy	100%	100%	-	-	✓	✓
Hobart	100%	100%	100%	100%	✓	✓
Huon Valley	60%	0	-	-		-
Kingborough	70%	69%	-	-	✓	-
Sorell	100%	100%	100%	100%	✓	-
Southern Midlands	53%	53%	-	-	✓	-
Tasman	88%	88%	✓	✓	✓	-
Region	89%	85%				

Overall, around 89% of regional households receive a kerbside garbage service and 85% receive a recycling service. Much lower proportions have access to a kerbside organics or hard waste service.

The collection methods and frequencies vary widely across the region, as summarised in Table 3.4.

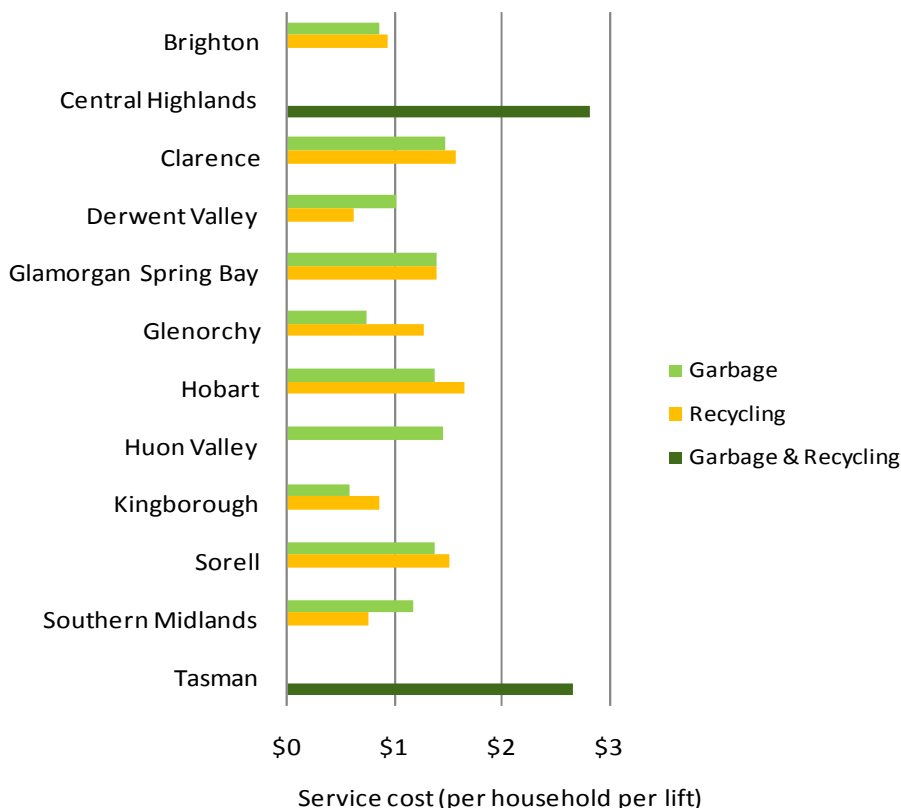
Table 3.4 SWSA Collection Methods & Frequencies

	Garbage	Recycling	Organics	Hard waste
Collection method	Bins only; mixed sizes	Crates & bins; mixed sizes	Mostly tied bundles	Loose or bundled
Frequency / type of service	Mostly weekly, some fortnightly	Mostly fortnightly, a few weekly	Mostly regular; varying frequency	Mostly annual

Huon Valley is the only council that does not provide a kerbside recycling service. There are also some differences between the scope of the service provided by other councils. Paper, cardboard and liquid paperboard is not recycled by Southern Midlands. Central Highlands, Derwent Valley, Sorell and Tasman councils accept only plastics 1 to 3 (PET, HDPE, PVC), while Brighton, Clarence, Glamorgan-Spring Bay, Glenorchy, Hobart, Kingborough and Southern Midlands collect an expanded range of plastics (types 1 to 7).

The collection service costs for each council are shown in Figure 3.1 on a per household per lift basis. In councils which provide collections on a weekly and fortnightly basis in different areas (e.g. Southern Midlands), the information in Figure 3.1 reflects the collection cycle provided to the majority of households.

Figure 3.1 Council Service Costs per Household



- Notes: 1. Costs for Central Highlands and Tasman include both garbage and recycling services.
2. Huon Valley does not offer kerbside recycling service.

Figure 3.1 shows that collection costs across the region are mostly below \$1.50 per household per collection. While separate costs for garbage and recycling services are not available for Central Highlands and Tasman, the total costs are generally consistent with the cost of services provided by other councils in southern Tasmania. The cost of providing recycling services is generally lower than provision of garbage services; while the relative ratio applying in Central Highlands and Tasman is not known, application of an arbitrary ratio of 40:60 would result in estimated costs at both councils ranging between \$1.06 and \$1.13 per household per lift for recycling services, and \$1.60 and \$1.69 per household per lift for garbage services.

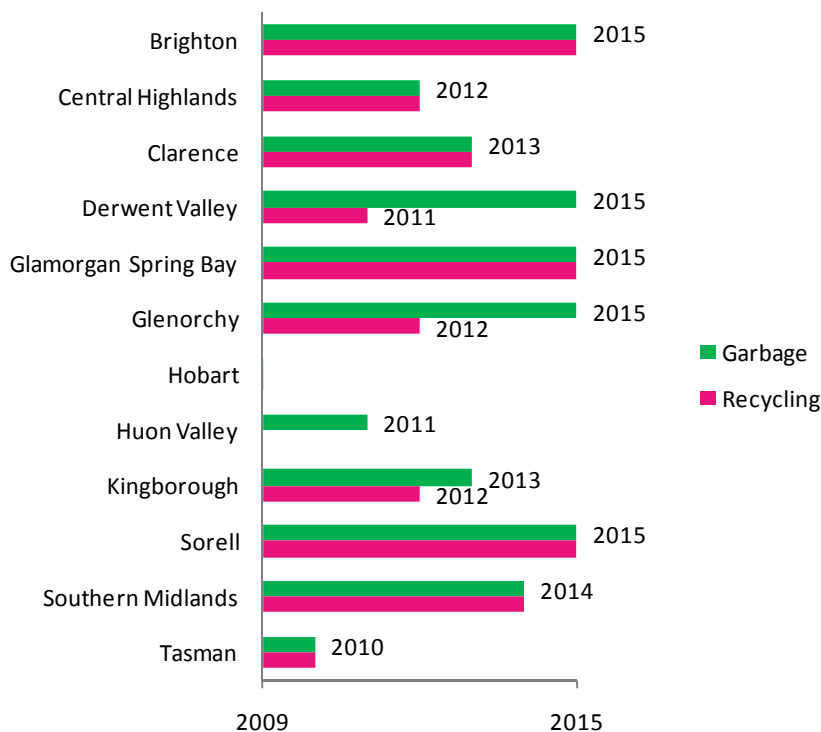
Primary waste contractors servicing the region are shown in Table 3.5.

Table 3.5 SWSA Waste Contractors

	Garbage	Recycling	Organics	Hard waste
Brighton	Veolia	Aussie Waste		In-house
Central Highlands	Thorp Waste	Ken Thorpe		In-house
Clarence	Veolia	Veolia	Veolia	Veolia
Derwent Valley	Veolia	Veolia		
Glamorgan-Spring Bay	Veolia	Veolia		
Glenorchy	Veolia	Veolia		
Hobart	In-house	In-house	Veolia	Spectran
Huon Valley	Thorp Waste			
Kingborough	Aussie Waste	Aussie Waste		
Sorell	Veolia	Veolia	Veolia	Veolia
Southern Midlands	Thorp Waste	Thorp Waste		
Tasman	Thorp Waste	Thorp Waste		

Contract expiry years are shown in Figure 3.2. Information on Hobart is excluded because its services are carried out by council staff. Huon Valley does not currently have a kerbside recycling collection service.

Figure 3.2 Council Contract Expiry Dates



3.2 Material Generation & Disposal

The waste collected by councils at kerbside (shown in Table 3.1) is not the only waste material managed by SWSA member councils. Additional amounts are deposited directly at council transfer stations and landfills by waste generators (both domestic self-haul and from the business sector), and some of this is recovered for recycling or re-sale. SWSA generation of both kerbside and self-haul waste in 2009/10 is estimated at 305,000 tonnes, of which around 124,000 tonnes was recovered and 181,000 tonnes was landfilled.

Additional waste generated in the southern region is deposited at Copping landfill. In 2009/10, Copping landfill received 72,163 tonnes of waste, comprised as follows:

MSW	6,231 tonnes	8.6%
C&I waste	59,453 tonnes	82.4%
C&D waste	6,480 tonnes	9.0%

However there is some overlap and anomalies in these figures as Copping landfill receives MSW from the following councils:

- Clarence
- Glamorgan Spring Bay
- Huon Valley
- Kingborough (to commence in 2011)
- Sorell
- Tasman
- Break O’Day (in Northern Tasmania region).

These councils generated in excess of 22,860 tonnes of landfilled waste in 2009/10, excluding Kingborough (whose figures are not yet included in Copping data) and Break O’Day (whose figures are not known); this is much more than the 6,231 tonnes of MSW reported in Copping figures. It is likely some of the MSW from these councils is transported by commercial contractors to Copping landfill and is recorded as C&I waste.

After allowing for this double-counting and an estimated generation of 2,500 tonnes per annum for Break O’Day (based on historic figures), it has been calculated that the total MSW, C&I and C&D waste generated in southern Tasmania in 2009/10 was around 340,000 tonnes, of which around 124,000 tonnes was recovered and nearly 216,000 tonnes was deposited to landfill. This compares to around 235,000 tonnes of waste landfilled in Northern Tasmania and Cradle Coast WMGs. The relative ratios of landfilled waste per region are estimated as follows:

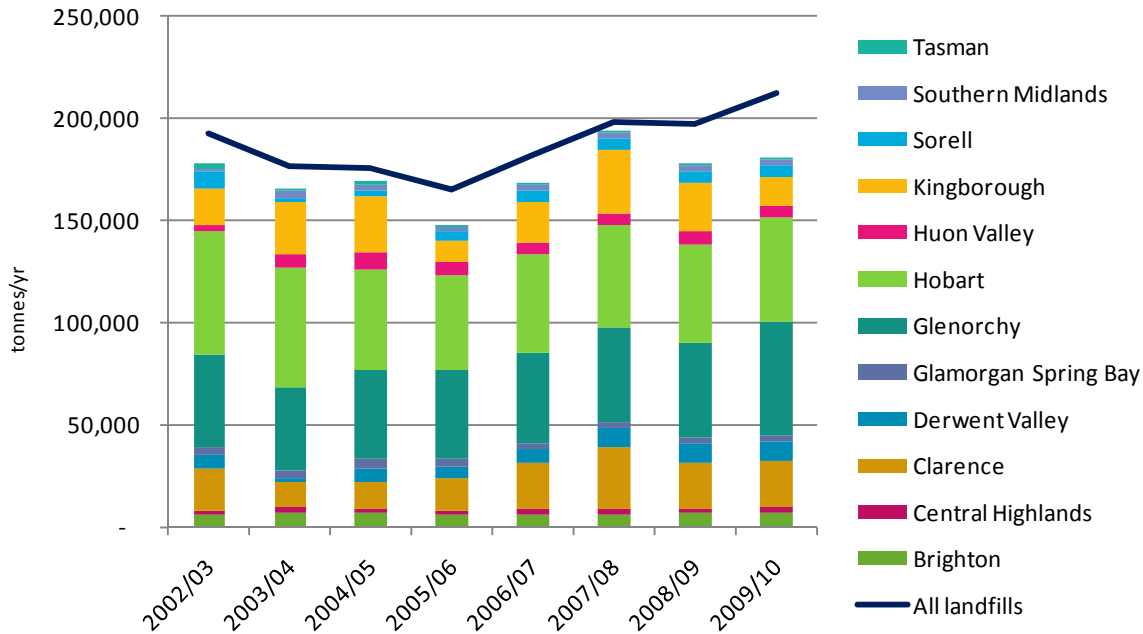
- Southern Tasmania 48%
- Northern Tasmania 32%
- Cradle Coast 20%.

Figure 3.3 shows the estimated generation of landfilled waste since 2002/03 in southern Tasmania. Council waste figures are based on those used for calculation of the SWSA voluntary levy; as this is in

some cases calculated on a population basis, there are likely to be some differences between this data and the actual amount of waste landfilled.

However Figure 3.3 does show a growing gap in the last two years between the total amount of waste generated and deposited in landfills in southern Tasmania, and the amount on which SWSA members pay a voluntary levy to fund waste minimisation and management initiatives.

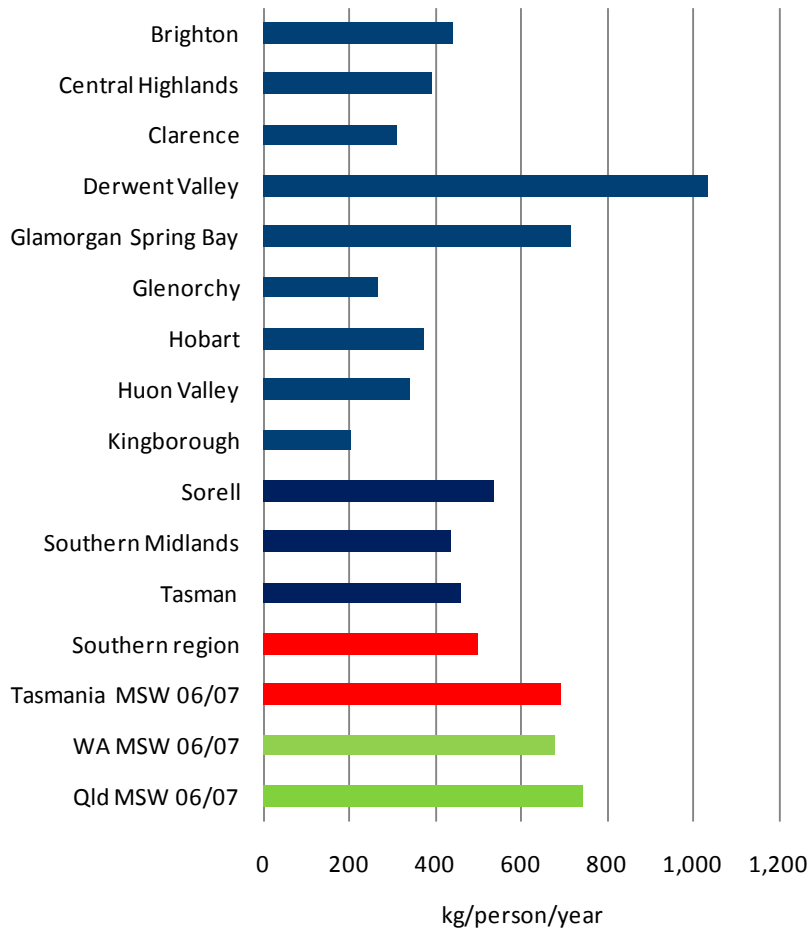
Figure 3.3 Landfilled Waste 2002/03 – 2009-10



An additional amount of controlled waste was generated and transported outside the region for treatment and disposal. According to the *Tasmanian Waste and Resource Management Strategy* (DEPHA 2009), approximately 10,600 tonnes of controlled waste was exported to other jurisdictions for treatment and/or disposal in 2007/08.

Figure 3.4 compares SWSA members' reported rates of municipal waste generation in 2009/10 divided by population (in kg per person), together with the rate for the southern region as a whole (including waste deposited at Copping landfill). It compares these with municipal waste generation rates for some other jurisdictions as reported in the National Waste Report (EPHC 2010). The chart suggests large regional differences in the quantities of waste presented at the kerbside even for councils providing similar services. It seems likely that some of the data are incorrect. The reported regional average quantity of waste generated is similar to other relevant jurisdictions.

Figure 3.4 Waste Generation Rates

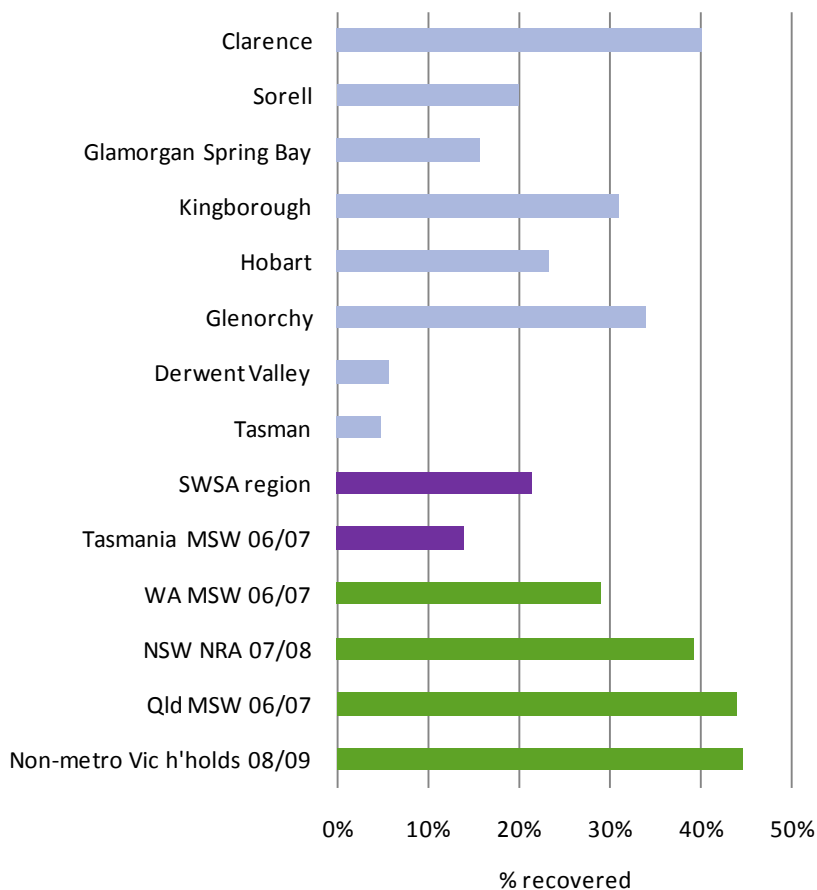


There is not enough detailed information to determine the generation by sector, viz. municipal, C&I, C&D. While the Copping landfill figures would indicate a high percentage generation by the C&I sector, the anomalies mentioned above in recording municipal waste deposited at Copping and the lack of information available on C&I and C&D waste being deposited at SWSA member landfills, does not allow for meaningful sector-based analysis.

However on a region wide basis (incorporating Copping landfill figures), the total waste generation rate including all sectors is around 1,400 kg/person/year. This compares to the SWSA regional MSW figure (shown in Figure 3.4) of just over 500 kg/person/year, indicating that collectively the C&I and C&D sector account for approximately 65% of generation, while kerbside municipal waste accounts for approximately 35%.

Figure 3.5 compares SWSA regional kerbside recycling rates in 2009/10 (for those councils where figures are known) with measures from some other jurisdictions. While this includes collected garden organics, it suggests that recovery rates are generally low².

Figure 3.5 Kerbside Recycling Rates



Note: 1. Figures unknown for Brighton, Central Highlands, Southern Midlands
2. The NSW NRA is that state's non-regulated area, comprising rural areas and provincial towns and cities where the landfill levy does not apply.

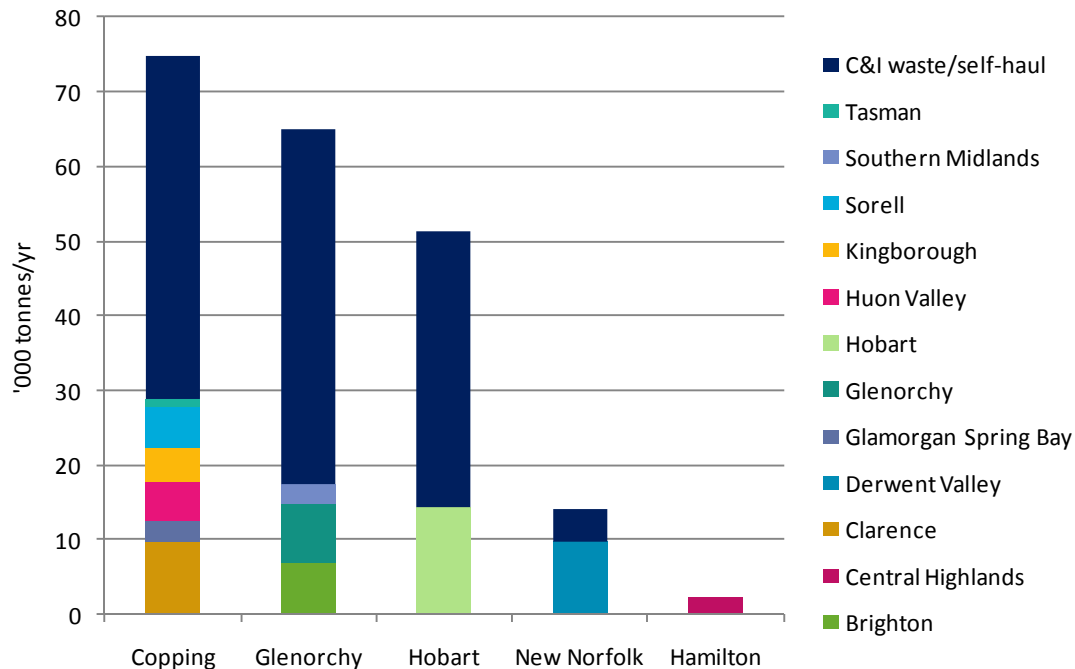
Sources: SWSA member data, DECCW (2009), EPHC (2010), Sustainability Victoria (2010)

Five different landfills are used for accepting the region's garbage streams. Figure 3.6 illustrates the depositions at these landfills in thousands of tonnes from 2011. Glenorchy and Hobart landfills receive the most municipal waste, jointly accounting for 79% of the total. Copping is used by more councils (five southern councils in 2009/10, increasing to six in 2011 with Kingborough disposal moving from Hobart) than any of the other landfills; it also attracts significant volumes of waste direct from the C&I sector. It

² Note that not all of the data is perfectly comparable: the SWSA member data is for kerbside collections only whereas the others are mostly for all municipal waste; the SWSA data is the proportion diverted to recycling whereas the Victoria data is for materials actually recovered.

is understood that some waste generated in Central Highlands is disposed of in Launceston but no further information is available, and data therefore cannot be included in Figure 3.6.

Figure 3.6 Waste Disposal Pathways from 2011



- Notes:
1. Kingborough waste included in Copping figures from 2011
 2. Additional C&I waste/self-haul believed to be deposited at Hamilton landfill but figures not known

All of the councils own, lease or operate waste infrastructure. Seven own a landfill or a share in a landfill (excluding Kingborough which has a share in Copping landfill operations but does not share landfill ownership). Nine own, lease or operate a total of 26 facilities for waste transfer and resource recovery (including 5 resale shops and compost facilities).

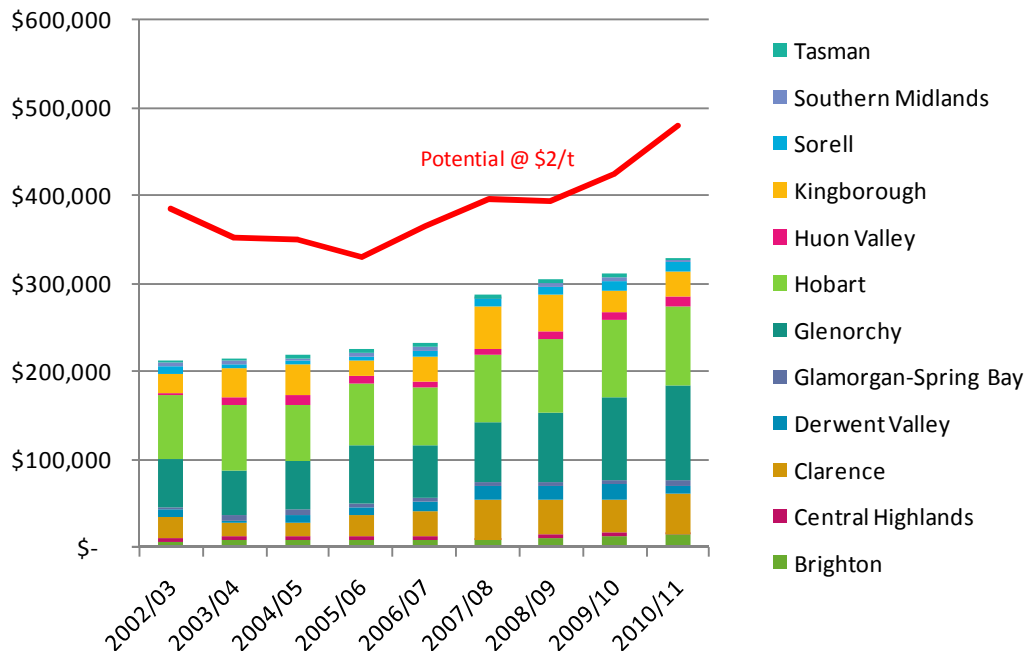
Kerbside recyclables are taken to the Veolia MRF. Veolia recover approximately 48,000 tonnes per annum of material through their MRFs in northern and southern Tasmania. Of this, approximately 63% is exported directly to Asia for re-processing; the remaining 37% is sent to Australian outlets for processing. Veolia landfills approximately 6,000 tonnes of contaminants from collected recyclables in Tasmania each year. The amount of these figures that relate solely to southern Tasmania is not known, however on a population basis southern Tasmania represents around 50% of the state, indicating that southern Tasmania may account for around half of the figures provided by Veolia.

3.3 Regional Programs

On a regional basis, SWSA collects funds from member councils to undertake regional waste programs. As discussed in Section 2.1, the funds are tied to a \$2 per tonne of landfilled waste equivalent (adjusted for transfer station or on population basis where weight of waste not measured). The amount of fees

levied has increased in line with the growth in waste generation each year. Figure 3.7 shows the amount of fees levied on SWSA member councils since 2002. For comparison purposes, the potential funding that would have been available if fees were levied on all waste (including that deposited at Copping landfill) at a flat rate of \$2 per tonne is also shown (as a red line). This indicates a gap of between \$100,000 and \$170,000 between the actual levy and notional funds available over the past 8 years.

Figure 3.7 SWSA Member Fees 2002/03 – 2010/11



Note: Copping landfill 2010/11 figures estimated based on 2009/10 rate of annual increase

Additional funds have been accessed by SWSA in past years from external funding programs, particularly the National Packaging Covenant funding for local government recycling and minimisation projects. This avenue of funding is not likely to be available in the future; with the implementation of the new Australian Packaging Covenant in 2010, the focus of projects has shifted away from municipal to industry waste programs and eco-design of packaging.

Recently SWSA has focused its efforts on waste communication and education initiatives, such as:

- development of the Taswaste website (www.taswaste.com.au) in conjunction with two other regional waste management groups (WMGs)
- school recycling programs in conjunction with the Australian Sustainable Schools Initiative
- 'Do the Right Thing' public education campaigns on television (in conjunction with two other WMGs and Veolia)
- provision of community information on recycling and composting approaches for food, organic, packaging and office waste

- liaison and information sharing with council members (including council representatives on SWSA board and technical officers)
- liaison with other stakeholders (including discussions with other two regional WMGs, submissions on the *Tasmanian Waste and Resource Management Strategy*, exploration of e-waste recovery proposals by waste industry).

Other recent initiatives undertaken by SWSA include the coordination of tendering for regional/sub-regional kerbside collection contracts on behalf of some member councils and a survey of community perceptions on waste.

Other proposed projects outlined in SWSA's 2010/11 annual business plan include a review of food and garden organics collection options, publication of updated brochures, introduction of a clean business challenge category to the Edward Hall Environmental Awards and ongoing involvement in the household hazardous waste collection program.

It is generally acknowledged that the current low revenue base of SWSA allows for current staffing costs, but provides little additional funding for major projects; increased waste reduction and recovery achievements would require increased funding, a matter included for consideration as part of this investigation.

4. INDUSTRY TRENDS

This section outlines the systems and structures that are in place or have been explored as part of the waste management and resource recovery industry trends in Australia. Internationally there are few jurisdictions with economies, governance structures, population characteristics and waste profiles similar to Tasmania. However where international trends are relevant, they have also been discussed.

4.1 Governance & Funding

While different states in Australia have different waste strategies, there is a common theme to the structural arrangements for waste minimisation and resource recovery in SA, Victoria and WA. In those states, the relevant state government has enacted legislation to establish a state waste/recovery authority (called respectively Zero Waste SA, Sustainability Victoria and Zero Waste WA) with the responsibility for planning for waste minimisation and resource recovery. These waste/recovery organisations are focused on strategic planning and project implementation but have no legislated responsibility for waste disposal or landfill management. Their role generally incorporates functions such as:

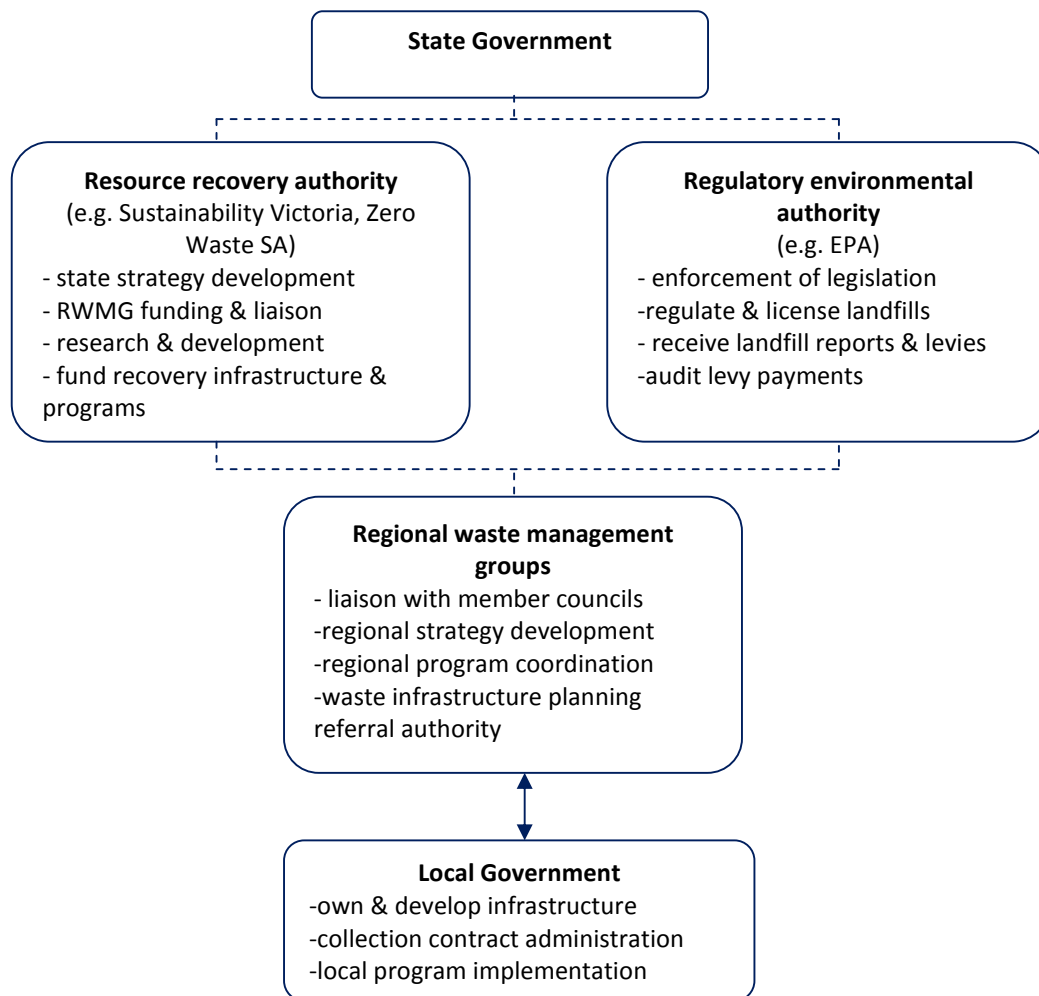
- development and coordination of state government waste policies
- development, administration and monitoring of state waste strategies
- provision of assistance to local government with arrangements for regional waste management
- commissioning, support and collaboration on research into waste management and resource recovery practices and issues
- development of standards and best practice guidance in relation to waste technologies, systems, infrastructure and practices
- coordination of education initiatives
- data collection and reporting
- support the development of sustainable markets for recovered resources.

The waste/recovery authorities were established separately to the organisations responsible for landfill licensing and regulation (usually the respective state's EPA). This allowed a clear delineation between the EPA's legislative role of ensuring waste disposal was undertaken in accordance with landfill regulations, and the advisory role of the waste/recovery authorities.

The waste/recovery authorities work with regional waste management groups comprised of a number of local governments to implement waste minimisation and resource recovery initiatives. These regional local government groups are usually focused solely on waste management and resource recovery, and do not have responsibility for other local government issues (except for some parts of SA). The regional waste management groups also work with other community and industry stakeholders to implement local initiatives.

A chart outlining the model discussed above is shown in Figure 4.1.

Figure 4.1 Interstate Governance Model



Depending on the particular state, local government representation in these arrangements may include representation on the board of the resource recovery authority. The regional waste management groups are comprised of local government representatives, although in some states there is the capacity to supplement the board with skills-based appointments who may or may not have voting rights.

In NSW, there was previously a dedicated waste/recovery organisation (Resource NSW) but this was subsumed into the Sustainability Programs Division of the Department of the Environment, Climate Change and Water (DECCW) approximately 9 years ago. However DECCW continues to undertake waste/recovery projects.

In both NSW and Qld there are regional organisations of councils which undertake waste management and resource recovery initiatives, generally structured as a sub-committee of local government organisations with wider responsibilities than waste.

In New Zealand there have been two tiers of local government since 1989. Territorial Authorities collect and manage waste similarly to local government in Tasmania, and are required under legislation to produce waste management and minimisation plans. The 16 Regional Councils represent a higher tier of local government. Their functions include regulating the environmental effects of waste disposal facilities and, potentially at least, facilitating a collaborative approach to waste management and minimisation.

Waste Levies

A waste levy is a market-based economic instrument which serves a number of purposes:

- it provides financial incentive to recover and recycle rather than deposit waste in landfill and provides a price signal to waste generators that landfill disposal has additional, sometimes hidden, costs
- it provides funds for waste minimisation and recovery programs which are more effectively undertaken at a strategic level (e.g. strengthening recycling markets, addressing infrastructure inadequacies)
- it helps to balance the price differential between existing landfill systems and new technologies, facilitating the introduction of innovative approaches to waste processing.

Four states (NSW, SA, Victoria, WA) currently apply a waste levy, and Qld will implement a levy in July 2011. The ACT Government owns that jurisdiction's only landfill and effectively applies the gate fee as a levy. These levies are called by various names (e.g. landfill levy, waste depot levy) but apply to waste deposited in landfills; there are exemptions and rebates for waste that is recovered or recycled, and in some cases an allowance for cover material. In some cases charity organisations (such as the Salvation Army) are excluded from levy payments. The levies are differentiated between areas in the state, with some applying only in metropolitan areas. Some states also differentiate between the type of waste material and/or source, with higher levies for waste with higher potential risk. In some cases upon introduction of the levy, a staged approach to levy increases was outlined at the same time, fixing levy rates for some years into the future.

In most cases, the levy has been applied on a unit rate per tonne of landfilled waste (inert waste in Perth is the only exception, which is levied on volume). Some states directed part of the initial levy revenue to councils to assist in establishing weighbridges at landfills that did not have them, enabling more effective weight-based measurement of landfilled waste.

Levy arrangements include a requirement for regular reports (monthly or quarterly) to the relevant EPA on the amount of waste accepted at landfills for disposal and recycling.

Current waste levies applying around Australia in 2010/11 are shown in Table 4.1.

Table 4.1 Australian Solid Waste Levies 2010/11

State	Area/waste type	\$/tonne
NSW	Sydney metropolitan area	\$70.30
	Hunter, Illawarra regions	\$65.30
	Blue Mountains, NE coast	\$20.40
Qld ¹	SE Qld & major regional areas	
	- C&I, C&D	\$35.00
	- Regulated waste: low hazard	\$50.00
	- Regulated waste: high hazard	\$150.00
SA	Adelaide metropolitan area	\$26.00
	SA rural areas ³	\$13.00
Vic	Melbourne metropolitan area & Vic provincial cities	\$30.00
	Vic rural areas – MSW	\$15.00
	Vic rural areas – C&I	\$25.00
	Prescribed industrial waste:	
	- Category B	\$250.00
	- Category C (low hazard)	\$70.00
	Asbestos	\$30.00
WA	Perth metropolitan area	
	- putrescible landfill	\$28.00
	- inert landfill ⁴	\$12/m ³

- Note:
1. Qld levy to commence July 2011
 2. Some states (e.g. NSW, SA) also apply levy to liquid waste
 3. SA non-metropolitan councils disposing of <10,000 t/yr can use population-based formula.
 4. WA inert landfill is the only volume-based levy in Australia

While NSW has the highest levy, the high rate applies only to the Sydney metropolitan area. SA and Victoria are the only states which apply the levy throughout local council areas in their respective states³, and a lower rate (up to 50% less) applies in rural areas.

In SA, levy arrangements allow for funds received to be directed as follows:

- 50% to Zero Waste SA Waste to Resources Fund
- 45% to EPA operational expenditure and environmental projects
- 5% to other government environmental projects.

³ SA unregulated areas not included

Funding to SA regional waste management groups and local governments flows from the 50% allocated to Zero Waste SA Waste to Resources Fund. According to Zero Waste SA's website (<http://www.zerowaste.sa.gov.au/councils/local-government-funding>), over \$8.1 million has been provided to SA councils (although the period to which this relates is not cited).

In Victoria, initial arrangements directed 70% of levy revenue to Sustainability Victoria, 20% to the EPA and 10% to regional waste management groups. Percentage entitlements were changed to lump sums in 2010, and current arrangements direct levy funds as follows:

- \$4 million to regional waste management groups for operating and staff costs
- \$20 million to Sustainability Victoria
- \$5 million to EPA
- \$30 million to EPA's prescribed industrial waste fund
- remainder to Sustainability Fund.

Victorian regional waste management groups have access to additional funding from Sustainability Victoria (which includes direct state government funding on top of the \$20 million from waste levies) as well as the Sustainability Fund.

In NSW, levy funds are directed by the state government to consolidated revenue. Nevertheless based on government funding of waste initiatives, the NSW Local Government and Shires Association (Verhey 2010) has estimated a waste hypothecation rate of around 55-59% of local government contributions. In WA, levy funds are hypothecated to a waste management fund.

The Qld levy to be implemented in July 2011 is expected to collect around \$379 million in its first 4 years of operation (DERM 2010). Averaged on an annual basis, the funds are expected to be directed as follows:

- nearly \$40 million/year (or 42%) to the Waste Avoidance and Resource Efficiency Fund for waste-related programs and projects
- \$30 million/year (or 32%) to the Sustainable Future Fund to assist in the delivery of local government waste and environmental programs
- \$25 million/year (or 26%) on state environment initiatives.

Further information on actual levy expenditure by purpose (e.g. minimisation, education or infrastructure projects) is not available from any jurisdiction.

New Zealand's solid waste management arrangements were fundamentally changed following a highly critical OECD report in 2007. The *Waste Minimisation Act 2008* significantly enhanced the regulatory framework for waste and recycling and provided for a waste disposal levy, which was set at NZ\$10 per tonne. Half of the levy funds are returned directly to local government for the purposes of helping them to minimise waste in accordance with the provisions of the Act. The other half is placed in a contestable waste minimisation fund against which industry, local government and community groups can bid for part-funding of their projects twice per year. Only one round has been completed so far. It attracted 163 eligible applications for funding of \$55 million, but only \$6 million was available. The successful projects included a nappy composting operation, a tyre pyrolysis plant, a research project into recycling in remote areas, and an education campaign about recycling farm plastics.

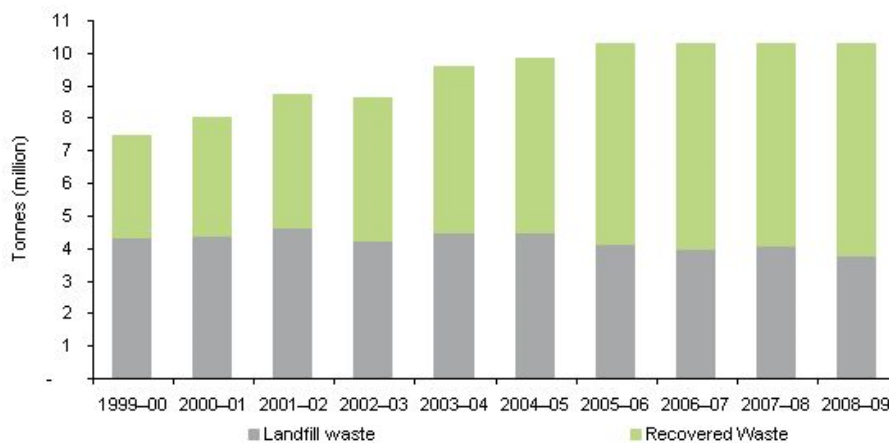
4.2 Waste Minimisation

Waste minimisation programs in Australia have generally been sector- based and include the following:

- Domestic:
 - Public education programs around reducing consumption, reducing the use of packaging, encouraging home composting, etc
- Commercial & Industrial:
 - Cleaner production programs, often using case studies in selected industry sectors
 - Design-for-the-environment programs, which produce products with less raw materials and less composites (especially plastics), and which can easily be dismantled at end-of-life for re-manufacturing
 - Product stewardship and extended producer responsibility programs, which address end-of-life management of products (e.g. through take-back schemes for reprocessing and re-manufacturing)
- Construction & demolition:
 - Waste minimisation/management plans for new developments required by planning authorities
 - Materials efficiency programs to reduce over-ordering of materials
 - Packaging and supplier take-back schemes (e.g. plastic wrapping, timber pallets)
 - Design features to maximise re-use potential (e.g. clean fill).

Initiatives to avoid and minimise the generation of waste around Australia have shown limited success to date. Victoria has an extensive database on waste recorded over 10 years. It is also the state that has seen greatest longevity in state government minimisation and recovery initiatives through first EcoRecycle Victoria (established in 1996) and later Sustainability Victoria. Despite this, waste records (graphed in Figure 4.2) show that total waste generated has increased from over 7 million tonnes in 1999/2000 to around 10 million tonnes in 2008/09.

Figure 4.2 Victorian Waste Generation 1999-2009



Source: Sustainability Victoria

A number of studies have shown close links between economic development, population growth and the amount of waste generated. Sustainability Victoria reported (September 2010) that Victorian waste generation relative to population and economic trends peaked in 2005-06 and has since shown a small downwards trend. Similar incremental downward trends were reported in South Australia by Zero Waste SA (Zero Waste 2007c). Given the period during which waste minimisation programs have been active in both states, this indicates progress in waste avoidance at the point of generation may be slow to achieve.

Figure 4.2 shows more success in materials being recovered and recycled, with the amount diverted from Victorian landfills increasing from around 3 million tonnes in 1999/2000 to around 6 million tonnes in 2008/09. This has also been the experience in SA, with Zero Waste SA trends (Zero Waste SA 2007c) showing that increased waste generation has to a large extent been taken up as increased recovery initiatives.

4.3 Collection Systems

There are a number of different combinations of garbage and recycling kerbside collection services in place around Australia. The preferred service details in each location may differ due to the type of services offered by local contractors, system economics, available infrastructure, distance to recyclable markets, state occupational health and safety (OHS) requirements and other issues. Collection service trends across Australia are discussed below.

Domestic

Kerbside garbage services usually specify the use of MGBs (manufactured with some percentage of recycled content). The trend has been towards reducing the size of MGBs provided for garbage from 240 L to 80 L/120 L or less. Studies (such as Sustainability Victoria’s local government data collection series from 2000/01 to 2008/09) have demonstrated that systems using smaller bins generated less waste and had greater diversion rates for recycling than those using larger garbage bins.

Prior to 2002, crates were the predominant method of collecting kerbside recyclables. However since that time, trends have shown a phasing out of crates and the introduction of MGBs for comingled recyclables. This has been to reduce wind-blown litter, provide additional capacity for increased diversion of materials, and address social equity issues (e.g. ease of handling by elderly and disabled). While some councils reported an initial increase in contamination upon changeover, education programs have addressed this and contamination from recyclables MGBs is generally within acceptable levels. The predominant service for kerbside recycling is the provision of a 240 L MGB on a fortnightly collection cycle, although some councils provide a weekly 120 L MGB collection service.

Metropolitan and regional city councils are increasingly offering garden organics kerbside collection services. This used to be predominantly a tied and bundled collection, but is now provided via 240 L MGBs in order to maximise diversion of garden organics. These systems may be on an optional basis or universally applied. They often involve additional cost to ratepayers (e.g. requiring purchase of the bin or a fee per collection) and are generally collected on a fortnightly basis.

There is a move in some areas towards including food organics in the garden organics collection system. This generally involves use of a kitchen tidy and compostable cornstarch bags; the bag and contents are

then placed in the garden organics bin for collection. The introduction of food organics collection is dependent on suitable composting systems being in place (in metropolitan areas this generally requires enclosed composting systems rather than open windrows, in order to address odour issues).

Around half of the councils in Victoria offer a hard waste collection service; the number of councils offering the service has remained the same over the past seven years, although councils are facing increasing OHS issues and contractors' concerns over diminished revenue as scavenging increases. In SA, the service is more metropolitan-focused, with 18 Adelaide councils and only 7 regional councils offering a hard waste collection service. Research by Zero Waste SA (Zero Waste SA 2007b) shows similar yields of material result from both at call and regular annual collections.

The cost of providing a kerbside recycling collection service has been decreasing with time, and in Victoria is now generally less expensive than providing a kerbside garbage collection service (Sustainability Victoria 2010).

Commercial & Industrial

Most councils no longer provide a garbage service to commercial or retail premises. Of those councils that continue to do so, it is usually part of a commercial arrangement with separate fees applying (on top of council rates or waste management charges).

Some councils have introduced a kerbside recycling service to small retail and office-based businesses. The service offered has been the same service provided to domestic residents, and has generally involved provision of a 120 L or 240 L MGB for collection of comingled recyclables.

4.4 Resource Recovery

Resource recovery initiatives in municipal waste have generally followed the composition of the waste stream, with initial efforts focused on the major constituents. While the composition of municipal solid waste in southern Tasmania is not known, recovery approaches around Australia on key materials commonly found in municipal waste are discussed below.

Domestic Recyclables

Most Australian councils have some form of recovery system in place for the collection of common domestic recyclables including paper and cardboard, liquid paperboard (i.e. milk/juice cartons), glass bottles and jars, steel and aluminium cans and plastic containers. In the past the types of plastics recovered was limited to PET, HDPE and LDPE, but with the introduction of better sorting systems at MRFs and increased access to markets, this has now expanded to include PVC, polypropylene and others (with some exceptions).

The emphasis in recent times has been on maximising the use of the collection systems in place. This focuses on diverting all possible recyclables from the waste stream and minimising any contamination which would inhibit recycling of the material. This involves continual education programs with key messages and outcomes such as:

- ensuring residents have a sound knowledge of all of the types of materials that can and cannot be recycled (e.g. through permanent stickers on bin lids and/or annual reminders)
- addressing the manner in which materials are presented (such as no materials tied in plastic bags)
- reducing the contamination of recyclables by other waste material
- providing feedback to the community on the end-products and markets of materials recovered (to continue community commitment to recycling).

The success of these education programs is often monitored through regular audits of the waste and recycling stream. This allows tracking of the diversion rate for particular materials, and fine-tuning of the education programs to address any problem areas.

A small number of regional waste management groups have established recovery schemes for other plastics, such as polystyrene packaging and linear low density polyethylene (LLDPE or silage wrap). This requires users to deposit it at a resource recovery centre (or transfer station) where it is collected under a regional contract. The quantities collected are generally low and the programs are driven more by environmental stewardship principles than commercial viability.

Organics

Food and garden organics represent a significant portion of domestic waste (up to 60% by weight in some municipalities). The diversion of organics from the residual waste stream has the potential to significantly reduce the amount of waste deposited to landfill and can:

- reduce the demand for landfill airspace
- decrease the environmental impacts associated with landfill disposal (including the generation of greenhouse gases, odour, groundwater contamination, etc)
- produce beneficial soil products, improving soil profiles, increasing organic carbon content and reducing water use of growing plants and crops.

Management of organics to date has generally focused on garden organics. Few Australian councils burn garden organics, not least because of high contaminant levels. Most have some form of processing in place, ranging from chipping and re-use as landfill rehabilitation, through to composting and sale of the finished product. Most councils have recognised the potential liability arising from residents using mulch contaminated with weed seeds and pathogens, and no longer sell material that has not undergone a heat treatment process (e.g. composting) to kill weed seeds and pathogens. Some councils offer an on-site chipping service as an alternative to collection (i.e. residents are expected to reuse their own prunings, tree branches, etc).

The predominant organic process used is open windrow composting, although this has changed in urban areas to a covered static pile or enclosed compost system to address odour issues resulting from proximity to residential areas. These systems are discussed further in Section 4.6.

The inclusion of food waste in garden organic collections is not widespread among Australian councils but is increasing. Zero Waste SA undertook a food waste collection trial among 10 metropolitan and regional councils. The trial tested the use of 2 different kitchen bin systems (one with a compostable cornstarch liner) for food organics, which were co-collected with garden organics. The trial showed good support by the community (continuing at a usage rate of 54% 12 months after the trial was

completed) and achieved a diversion rate of around 60% (Zero Waste SA 2010). The trial was followed by preparation of a business case which could be used by SA councils to investigate the financial feasibility of implementing food organics collection in their municipality.

Other MSW

Statutory authorities in a number of Australian states have identified some priority materials which have warranted special recovery programs. These include e-waste, tyres, packaging, paint, mercury-containing lamps and batteries.

Although by definition e-waste includes all electrical and electronic equipment, the main focus of recovery efforts is on end-of-life televisions, computers, printers & similar equipment; this is due partly to the increasing number of used televisions and computers in the waste stream, but also reflects the nature of their components (e.g. heavy metals such as lead, zinc, cadmium, chromium and mercury) and the potential environmental impact on leachate from unlined landfills. E-waste is increasingly being diverted from landfill and recycled to recover the metals and plastics (and precious metals in older models). The commercial viability of e-waste recovery is likely to improve when the proposed product stewardship scheme (PSS) with the television and computer manufacturing industry is regulated in 2011. This is expected to result in the establishment of e-waste recycling standards, greater participation by retailers and manufacturers in recovery and increased diversion of material from landfill. A new e-waste recycling approach (using an organic chemical degradation process) has been proposed by a Tasmanian company (SBBM Enterprises), however this is still in development stage and is not yet commercially established.

Used tyres are problematic in landfills (unless shredded, they float to the top over time) and a material with a high calorific value. Early reuse applications (such as to stabilise embankments and in civil engineering works) have not proven wholly successful, due to concerns about leaching and the additional cost involved to stop tyres from moving. Recent recovery initiatives have tended to take either of two approaches: using tyres as a fuel in cement kilns, or shredding, extraction of metals and reuse of the rubber in other applications. The cost of transport and processing for both options has tended to inhibit widespread recovery efforts. However there are on-going discussions between government and industry regarding establishment of a product stewardship scheme for used tyres. Once finalised, this is expected to see funds being made available for the development of recovery programs.

The Australian Packaging Covenant (APC) was established in July 2010, continuing the voluntary industry efforts to address used packaging material first implemented by the National Packaging Covenant (NPC). The voluntary initiative is underpinned by the *National Environment Protection (Used Packaging Materials) Measure* which regulates management of used packaging materials by non-signatories to the covenant. Although signatories to the new APC are still being finalised, both the Tasmanian Government and SWSA were signatories to the previous NPC. In 2009 the Tasmanian Government commissioned an assessment of the feasibility of introducing a container deposit system (CDS) in Tasmania (DEPHA May 2009). The outcomes of the study show that a CDS may achieve increased recovery of beverage containers but that introduction would be complex and challenging. The position of the Tasmanian Government on introduction of a CDS is not clear. However as the NPC was introduced to preclude a legislated approach to container deposit legislation, the two systems are generally thought to be incompatible. As most CDS programs around the world pre-dated the

establishment of comprehensive kerbside recycling programs, there is a lack of definitive evidence to demonstrate whether (all other factors being equal) one system achieves better outcomes than the other.

Paint, mercury-containing lamps and household batteries are generally recovered as part of the household hazardous waste collection programs established in most states. Paint is the predominant waste collected in such programs, representing around 58% in NSW (DECCW August 2010) and 54% in Victoria (Sustainability Victoria October 2010) of material collected in 2009/10. While water-based paint may be mixed and re-used, the difficulty in segregating water-based from oil-based paint has led to most paint being used for energy recovery (e.g. comprising part of a blended fuel). Given the amount of waste involved and the potential for recycling/reuse applications higher up the waste hierarchy, some interstate resource recovery authorities have commenced discussions with the relevant paint industry association to explore opportunities for extended producer responsibility (EPR). It is understood a joint pilot project may be undertaken in 2011 to develop alternative used paint management methods.

In Victoria some similar EPR pilots have been undertaken jointly by industry and Sustainability Victoria for other waste materials, including Batteryback for household batteries, Byteback for computers and Flashback for compact fluorescent lights (CFL) and other mercury-containing lamps. These pilots provide information on costs, recovery rates and logistics needed for the development of a PSS. Just as the Byteback program assisted in the establishment of the PSS for televisions and computers, it is hoped that PSS for other materials will be developed in the near future.

4.5 Landfills and Resource Recovery Centres

In recent years landfill environment protection measures have increased in line with our knowledge of their impacts. Improved engineering and management practices come at a cost and it is more efficient to provide such expensive infrastructure as a regional asset. Consequently there has been a rationalisation of landfills across Australia, with closure of small landfills and development of large regional landfills to service a number of municipalities.

Guidelines on landfill best practice have been developed by most state EPAs; the *Landfill Sustainability Guide 2004* (DPIPWE 2004) outlines regulatory requirements for landfills in Tasmania. Best practice guides reflect the body of knowledge at the time; best practice moves as knowledge increases and the guidelines are regularly updated. However it is important that landfill operations are carried out in light of the duty of care owed to our environment, rather than a minimum regulatory approach; this is borne out by the experience of Cranbourne landfill in Victoria. This landfill was owned and operated by Casey City Council, and closed in 2005. Even though construction of the landfill was carried out in accordance with EPA requirements of the time, the lack of lined cell walls resulted in migration of methane into houses subsequently built in the adjacent residential estate. Safety concerns over the high methane levels led to evacuation of some houses and long term monitoring systems being installed. The incident led to huge disruption of the local community and the matter is the subject of a class action against the council which is expected to be heard in Victorian courts in 2011. If there are adverse findings against the council, the cost impact could be significant.

The potential legacy issues of old, generally unlined, landfills has also driven the move towards regional landfills. The lack of good recordkeeping often means there is a lack of knowledge of the types of waste that may have been deposited in the landfill in the past. Given that this may have included a range of

hazardous wastes, and that the site's hydrogeological characteristics may see the impact of leachate on the surrounding environment for 100-200 years, the future need and cost of rehabilitation may be significant. The lack of full cost recovery included in landfill gate fees charged in the past means that there may be a large gap in council resources for future rehabilitation, management and monitoring of closed landfills.

For these and other reasons, there has been a trend of councils opting out of developing large landfills in metropolitan areas around Australia. Large metropolitan landfills are increasingly being owned and operated by large international waste companies; these are seen to have the capacity, experience and resources to adequately develop and manage the necessary infrastructure. In rural areas, large landfills are often still owned by councils but operations may be contracted to medium-sized waste companies who can demonstrate relevant expertise.

Small landfills have generally been replaced with transfer stations (or resource recovery centres). There is a general trend towards changing the terminology of transfer stations to that of resource recovery centres (RRC). This is to reflect the increasing priority of these facilities towards recovery initiatives rather than that of simply transferring waste to a final disposal point. Interstate resource recovery authorities in Victoria & NSW have supported the improvement of infrastructure through the establishment of benchmark guides (e.g. Sustainability Victoria's 2009 *Guide to Best Practice at Resource Recovery Centres*) and infrastructure funding programs.

There is a trend in most RRCs to establish compaction equipment in order to improve the economics of transporting residual waste to landfills. This may range from hydraulic equipment at large facilities to relatively 'low tech' methods (e.g. use of front-end loaders to compact waste in skips) at small rural facilities. There is also a trend to establish RRCs at landfills to keep the public away from the tipping face (for OHS reasons) and to facilitate greater recovery of materials.

In addition to accepting residual waste for disposal, RRCs provide options for recovery of an increasing range of material. Common materials accepted for recycling generally include kerbside recyclables (i.e. plastics, glass, paper/cardboard, etc), garden organics, timber (untreated), ferrous and non-ferrous metals, oil, concrete, bricks, lead acid batteries, gas bottles, clean soil and e-waste. In some areas, low-level hazardous wastes such as paint and flammable liquid hydrocarbons (e.g. kerosene, petrol) are also accepted for recovery.

Repair and resale centres (or tip shops) are established at many points around Australia, including southern Tasmania. Their commercial viability is generally dependent on low staff costs; consequently they are often established with the participation of a community organisation (e.g. groups for the disabled or socially disadvantaged) or prison labour. Given the wide dispersment of these groups, there are not large numbers of repair and resale centres around the country. Engagement with and support from the local community is sometimes facilitated by an artist-in-residence program, providing artworks manufactured from recovered materials.

4.6 Waste Treatment Technologies

The waste industry is increasingly looking to waste treatment technologies as an alternative to landfill disposal of waste. In the infancy of these technologies, they were known as alternative waste technologies (AWTs); however with their increasing growth in numbers, they are becoming less alternative and more mainstream, and the terminology is shifting. Hence in this report discussion on waste treatment technologies (WTTs) encompasses those technologies available for treatment of recovered and residual waste streams.

WTTs generally recover or beneficially use a large proportion of the organic waste stream, although in most current technologies there is a residual (e.g. char, slag) of at least 10% which cannot be further treated and must be disposed of to landfill. An overview of the range of WTTs for processing mixed or source-separated organics is provided below.

Mixed Waste Processing

Mixed waste WTTs use mechanical and manual processes to sort MSW to extract:

- recyclables (metals and sometimes plastics, larger cardboard and paper, and glass)
- an organic rich or calorific fraction
- hazardous wastes (such as chemical and e-waste)
- residual waste.

The organic rich/calorific fraction is then processed by either biological or thermal means to recover energy or/and stabilised organic materials. These facilities typically recover less recyclables and reusable organics per tonne of throughput than source-separated systems due to contamination, but can be used to manage the residual MSW stream. In other words, the technologies are currently not advanced enough to replace the need for source-separation of dry recyclables and potentially garden and food organics.

In Australia, recent experience suggests that mixed waste WTTs are typically only viable when landfill prices rise to \$150-200 per tonne and concessions are made for the management of low grade stabilised organic outputs.

Separation of mixed wastes is sometimes undertaken using a dirty MRF. This may involve sorting of C&D waste only or all mixed waste streams.

Source-separated Processing

Source separation involves providing waste generators with drop-off points and /or bins to separate recoverable streams such as dry recyclables and garden (and possibly food) organics. Although collection costs may be increased, the cost of processing the separated streams is reduced and the value and recovery rates of outputs are typically higher.

In the case of organics recovery, provision of a kerbside garden organics service to households typically significantly increases the weight and volume of wastes managed via kerbside services without necessarily a corresponding drop in landfilled MSW at kerbside. This is because garden organics typically only contribute 5-15% by weight to kerbside MSW (representing in the order of 30-90kg per household), but households provided with a service will typically produce 180-350 kg per year per

participating household, disposing of garden organics that would otherwise have been managed on site or taken to landfills and transfer stations by self-haul traffic. In addition, where the provision of a garden organics service creates more 'empty room' in the MSW bin, households have the capacity to dispose of more (and potentially denser or heavier) materials at kerbside. Recovery of food organics, which typically contribute 30-50% by weight of kerbside MSW, but less volume, has greater potential to reduce waste to landfill.

Where a kerbside organics service is introduced, recovery of food organics through the service should be considered. This has implications for the type of collection and process systems required to manage organics. Limited experience in Australia suggests that it is possible to maintain fortnightly or even monthly collection of garden and organics services where biodegradable 'breathable' bags are used for the capture of kitchen food scraps. These systems have also used 'kitchen tidy' bins to increase participation and place emphasis on only recovering biodegradable food wastes. Where councils have introduced weekly organic services but fortnightly garbage collection, or simply promoted 'food waste' services, contamination from food waste packaging and 'spillover' from overfull rubbish bins is a major risk. Therefore where a garden and food organics service is to be provided, consideration should be given to providing kitchen tidies and suitable biodegradable bags. These will typically add a cost of \$15-20 per household per year to provision of the service but should reduce contamination and allow less frequent collection of the organics service.

Biological Treatment

Biological treatment systems use bacteria to degrade organics to yield stabilised organics and/or bio-energy.

Aerobic Composting

Aerobic composting is the process whereby organic materials are decomposed by micro-organisms in the presence of oxygen. The composting process requires management of a number of parameters to maintain optimum levels of microbial activity, including temperature, moisture content, acidity and oxygen levels. Aerobic composting can be undertaken by a range of methods:

- **Static pile:** Organics are shredded and blended to have a high Carbon-to-Nitrogen ratio to promote a slow composting process. Piles are left undisturbed for months, sometimes with covers and sometimes with passive aeration provided with placement of perforated piping under and through piles. This technology may be appropriate for small scale organics processing operations such as smaller township drop-off organics, but runs a higher risk of odour at a larger scale. In Australia, the City to Soil/Groundswell operation at Goulburn (NSW) processes bin collected garden and food organics using a covered static pile with addition of specialised inoculating bacteria. The facility has operated for over 18 months without odour incident and is producing a compost selling for up to \$100 per tonne (\$60/m³). This is the technology proposed to be trialled at Barretta by Kingborough Council. This is worth investigating, although the risk for odour and greenhouse gas emissions will likely be higher than well managed turned windrow, aerated, in-vessel and fully enclosed systems.
- **Open turned windrow:** Shredded organic waste is mixed and placed in open windrows which are periodically turned for aeration. Moisture levels and nutrient balances are maintained at a level to promote an active compost. The height, width and length of the windrows vary depending on the nature of the feedstock and type of equipment used for turning.

Windrow composting is carried out in the open air, therefore buffer distances similar to or greater than those for landfills are required. There are no emissions controls. Windrows are placed on a concrete hardstand and leachate management systems are required to manage water run-off. Odour has proven to be of particular concern in Victorian open windrow facilities. The level of odour generated will depend on the materials received, management practices, the volumes and exposed surface areas of materials on site, and local atmospheric conditions. Unlike most other sources of odour where wind disperses odour, odour from open composting facilities is increased by wind which ‘draws’ odour from piles more rapidly and reduces the extent to which odour particles are oxidised in the outer layers of the pile. Testing of Victorian composting facilities has found that due to this ‘wind effect’ even a medium wind can increase odour emitted by piles by over 500% and create a plume of odour in the wind direction. Odour modelling of facilities there needs to consider the potential emissions under windy conditions. Dust and vermin control may also be key issues for management.

- **Aerated static pile:** As with open windrow systems, shredded organic waste is mixed and placed in piles. Aeration of the pile is provided via a series of perforated pipes beneath the windrow; the pipes are connected to a fan that either draws or blows air through the piles as required. Air is passed through a biofilter for odour management. The pile may be either covered (e.g. by a GORE™ or other cover that contains odour) or uncovered. Systems that either blow air at the base of piles and/or extract air at the top of covered piles have been developed. Systems that extract air can have lower energy demands and can recover gases for treatment.

Static piles are often used for composting wet materials (such as sludges) mixed with a bulking agent (e.g. woodchips) which provides structural stability and maintains air voids that eliminate the need for periodic turning.

- **In-vessel:** Shredded organic waste is processed in a sealed vessel or reactor on a batch system. A range of vessels may be used, including bio-bins, vertical compost units, tunnels, etc. The vessel allows greater control of system inputs (such as water, temperature, etc) and outputs (such as odour).
- **Enclosed:** Composting is carried out in an enclosed facility to better manage odour, water and environmental issues. The facility may enclose a varying range of compost technologies, e.g. windrows, static piles, vessel or tunnel composting.

All aerobic composting processes require a subsequent period for curing and screening manufactured compost. Depending on the process used, up to 12 weeks may be required to produce compost products. Technologies are available that can produce young composts after as little as 7-14 days, but the products are still very biologically active and should not be used for higher value and sensitive uses without a period of maturation or application to land followed by a ‘withholding’ period before sensitive plants are sown or planted.

Vermiculture

Vermiculture involves the use of earthworms to convert organic waste into excreted vermicast which can be used as a fertiliser in a range of soil products. The process needs to be managed to maintain a range of optimum conditions for earthworms, including temperature, acidity, moisture level, particle size, etc. For these reasons (as well as odour and vermin control), vermiculture is suited mostly to wet food waste and should be carried out in a roofed enclosure. In most applications in Australia, it has been used as an additional process after composting (vermi-composting) to increase the value of end-products. Materials must be sterilised at some point in the process to kill pathogens and weed seeds which worms do not kill.

Anaerobic Processing

Anaerobic processing includes both digestion and fermentation.

- **Anaerobic digestion:** Digestion utilises bacteria active in the absence of oxygen. Within an enclosed vessel (or digester), the organic waste is converted into biogas (typically 55% - 75% methane), as well as a solid digestate. The biogas can be used to generate electricity and the digestate can be used as an organic fertiliser or can be aerobically composted to make a soil conditioner. Anaerobic digestion is suited to wet organic waste and has traditionally been used for the processing of effluents such as animal manures, although a digester using C&I food waste is in operation in Sydney. Anaerobic digestion systems processing organics derived from mixed waste have had limited success to date in Australia due to technical difficulties and contamination of the residual organic output.
- **Fermentation:** Fermentation also occurs under anaerobic conditions and involves conversion of organic waste by yeasts and bacteria into ethanol, biogas and organic soil products. Ethanol can be utilised as a fuel for specifically adapted engines, while the biogas can be used to generate electricity. Fermenters (like digesters) are enclosed systems, well suited to wet organic waste that may be odorous.

Both forms of anaerobic processing are generally more capital intensive than aerobic processing, but have the potential to generate renewable energy.

Thermal Treatment

There are four main methods of thermal processing used for organic waste:

- **Combustion:** Combustion involves burning, generally of mixed MSW or woody and timber organic waste, to produce energy in the form of heat and steam-turbine generated electricity. The process can use a range of technologies (e.g. moving grate, inclined grate, fluidised bed, etc) and requires significant air emission controls.
- **Refuse Derived Fuel:** Refuse derived fuel (or RDF) involves the production of solid fuel via a mechanical handling process. This can be produced as either coarse RDF (waste is pulverised and used with little additional treatment) or densified RDF (waste is refined, dried and compacted). Densified RDF is generally produced in a briquette or pellet form, which can then be used via combustion as a fuel for industrial boilers or to generate electricity.
- **Pyrolysis:** Pyrolysis heats waste to temperatures between 400⁰ – 800⁰C in an oxygen-free atmosphere to produce a gas, liquid and solid char material. Both the gas and liquid can be used to

generate electricity. The relative proportions of gas, liquid or char produced depends on the method of pyrolysis and process parameters (such as temperature and pressure).

- **Gasification:** Gasification heats waste to temperatures over 900⁰ C in a low oxygen atmosphere to produce a fuel gas which can be used to generate electricity. A solid char material is also produced.

All thermal processing systems require major air emission control equipment which can add significantly to the cost of the plant. Thermal systems are therefore generally used for large throughput facilities where economies of scale make the system more financially feasible.

Summary

The advantages, disadvantages and estimated costs of all technologies discussed above are summarised in Table 4.2.

While these are the base technologies, some facilities combine equipment and technologies for mechanical and biological treatment of waste. Australian examples include the following:

- bag-breakers and trommels to spread material from domestic garbage collection, magnets and sorting lines in a dirty MRF to recover additional recyclables and exclude large contaminants, aerobic percolation to add water to organic fraction, anaerobic digestion of wet organics, enclosed composting of digester sludge and oversize organics, generation of electricity from methane produced by digestion.
- bag-breakers and trommels to separate domestic garbage materials, immersion in water tank, separation of recyclables and inorganic material by different specific gravities in water, saturation of organic materials, anaerobic digestion of wet organics, generation of electricity from methane produced by digestion.

Table 4.2 Summary of Technologies

Technology	Costs¹	Advantages	Disadvantages
Mulching	Usually contracted; no technology costs Regional processing fee approx. \$10 per m ³	Low technology process No specific expertise required Low cost re-use application Can be used by council in own operations (e.g. parks, landfill capping/rehabilitation)	Restricted to green waste only Contamination of feedstock can affect end-products Can spread weeds and plant pathogens Lower value product
Static pile composting	Capital costs of <\$0.5 million Due to small scale, costs per tonne and gate fees are \$45-65 per tonne	Low cost Less need for material turning equipment Suited to small volume composting where there is adequate room and buffers to hold materials for an extended period	Higher odour risk Potential for higher greenhouse gas emissions Not suited to larger scale operations Not well suited to food or wet garden organics
Open windrow composting	Capital costs approx. \$0.5 - \$2 million Gate fees \$35 - \$55 per tonne	Technology well established in Australia Low capital and operating costs Facility can be sized to suit waste volume Easy to expand operations Cheapest composting alternative Potential for small on-farm composting operations with appropriate buffers	Large buffer distances required Subject to odour issues Restricted waste streams Not suited to food and wet organic waste High level of quality controls required Contamination of feedstock can affect end-products Lower value products
Aerated static pile composting (windrow or bays, covered or uncovered)	Capital costs approx. \$2 - \$5 million Gate fees \$45 - \$80 per tonne	Well established technology Can use specialist laminated membrane covers (such as the Gore composting system) or odour management via biofilter Smaller site footprint than windrow composting Lower vehicle, labour and fuel costs	Large buffer distances required Odour issues must be carefully managed Contamination of feedstock can affect end-products Higher energy use for pumps Lower value products
In-vessel composting	Capital costs approx. \$2 - \$20 million Gate fees \$75 - \$125 per tonne	Odour controlled in vessel Quicker processing times than other composting Can process more odorous material (e.g. food waste, C&I waste) Quality controls	Higher capital costs than windrow or static pile composting More difficult to expand operations Specific technical expertise required

Technology	Costs ¹	Advantages	Disadvantages
Enclosed composting	Capital costs approx. \$4 - \$10 million Gate fees \$45 - \$100 per tonne	Odour controlled in building Dust and litter issues minimised Can process more odorous material (e.g. food waste, C&I waste) Quality controls	Highest capital costs of all composting options More difficult to expand operations Specific technical expertise required (e.g. maintenance of negative pressure in building)
Vermi-composting	Primary composting costs as above. Additional costs \$0.2 - \$1 million.	Simple technology Low capital and operating costs Established market for organic soil products Facility can be sized to suit waste volume	Supplementary to other composting systems Additional system cost may not equate to additional product value Maintenance of earthworm ecosystem requirements
Anaerobic digestion	Capital costs approx. \$10 - \$40 million Gate fees \$100 - \$140 per tonne	Well established technology Capture of greenhouse gases Generation of renewable energy Revenue from sale of electricity and soil products	Greater technical expertise required to manage process compared to composting Suitable for wet organic waste only Contamination will affect process Must be located close to transmission lines for recovery of electricity
Fermentation	Capital costs approx. \$10 - \$40 million Gate fees \$100 - \$140 per tonne	Capture of greenhouse gases Generation of renewable energy Production of ethanol can be used as fuel Revenue from sale of electricity, ethanol and soil products	No operating plants in Australia Suitable for wet organic waste only (not suitable for timber or woody wastes) Contamination will affect process Must be located close to transmission lines for recovery of electricity
Combustion	Capital costs \$10 - \$100 million Gates fees \$100 - \$300 per tonne	Well established technology Ability to handle all waste streams (including hazardous waste) Generation of renewable energy	High capital and operating costs Large waste throughput required Often negative community perceptions Expensive air emission controls required Low demand for heat energy Need for disposal of ash

Technology	Costs¹	Advantages	Disadvantages
RDF	Capital costs \$10 - \$50 million Gate fees \$100 - \$200 per tonne	Proven technology overseas Ability to use products in range of industrial fuel applications Emissions controlled in secondary industrial applications	High capital and operating costs Not well established in Australia Not suited to wet organic waste Large waste throughput required Limited local demand for fuel
Pyrolysis /Gasification	Capital costs \$40 - \$100 million Gate fees \$130 - \$300 per tonne	Reduced air emission concerns compared to combustion Generation of renewable energy Ability to utilise general waste stream and some hazardous waste Potential to produce biochar products Can also produce hydrogen, methanol & ammonia (with additional processing)	High capital and operating costs Technology not well established in Australia Demand for specific technical expertise Large waste throughput required Must be located close to transmission lines for recovery of electricity Low local demand for hydrogen, methanol, ammonia and heat energy Potential toxic organic compounds in residue and residual 'liquor'/tar

Notes: 1. All costs are estimates only and subject to facility size, throughput and site-specific circumstances.

4.7 Litter & Illegal Dumping

Across Australia littering and illegal dumping of waste is generally targeted by a mix of education and enforcement by regional WMGs and state authorities, while local councils are primarily responsible for cleaning it up.

The National Litter Index is a research project carried out by Keep Australia Beautiful (with funding from the Australian Government) involving twice-yearly litter counts in each state. Results for 2010 (Keep Australia Beautiful National Association, July 2010) show that cigarette butts continue to be the most numerous litter item, while plastic accounts for the largest items. Results for the past 5 years for each state are compared to the national average in Figures 4.3 and 4.4.

Figure 4.3 National Litter Results 2005-10 (by number)

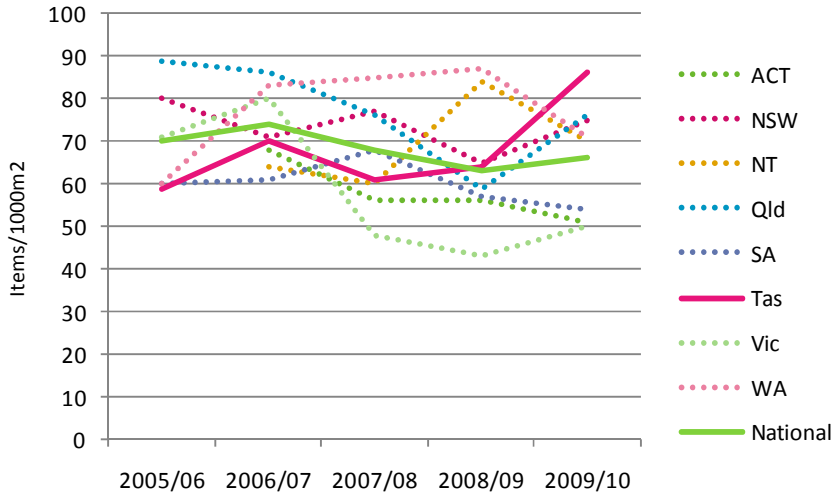


Figure 4.4 National Litter Results 2005-10 (by volume)

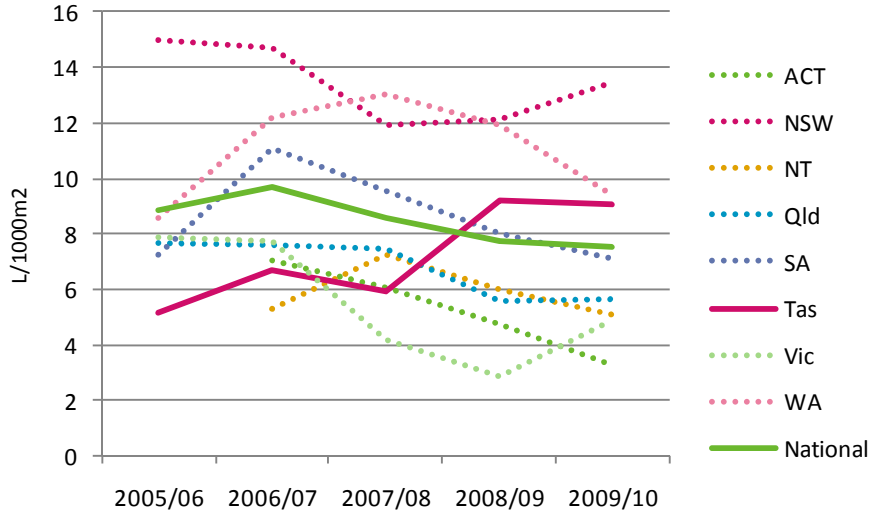


Figure 4.3 shows that in 2009/10 Tasmania performed much worse than other states in terms of the number of litter items counted. While Qld has experienced higher counts in the past, there has been a consistent downwards trend in litter numbers in that state over the past 5 years. It would appear that while the national average has decreased, Tasmanian results have increased. This is true for the results by volume as well. Figure 4.4 shows that while Tasmanian results are not as bad as NSW and WA, the state has performed worse than the national average for the past 2 years.

The NLI litter results do not reflect the full scope of illegal dumping; instances of illegal dumping are generally cleared up by councils more regularly than smaller litter items and few databases of dumping incidents are maintained at state level. Illegal dumping was of such concern in the Sydney region, that DECCW established a Regional Illegal Dumping (RID) squad to tackle the problem. The first RID squad was established in 1999 in Western Sydney; a second to the south of Sydney followed in 2004. The RID squads are involved in strategic and education responses to illegal dumping, and are also responsible for investigating incidents, organising clean-ups and taking action against offenders. In 2007/08, the 2 RID squads investigated nearly 3,000 incidents involving over 12,000 tonnes of waste; around 600 clean-up and penalty notices were issued.

In October 2010 the EPA Victoria announced the establishment of a Strikeforce program to measure and counter illegal dumping, investigate incidents in cooperation with local councils and hold offenders to account. Results to date are not yet known.

Litter has been particularly targeted by Sustainability Victoria with the development of a statewide litter strategy. Sustainability Victoria also funds a special project officer, the Victorian Litter Champion, with responsibility for improving litter management practices in Victoria. Government funding of \$6 million was announced in 2010 to implement the Victorian litter strategy.

5. DISCUSSION

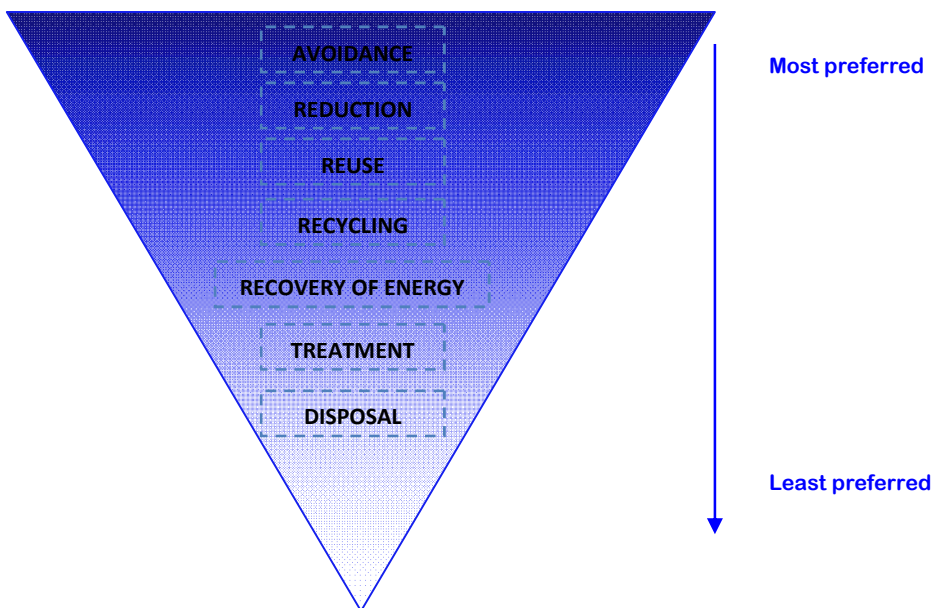
Building on industry trends and practices (discussed in the previous chapter), this section discusses issues and opportunities relevant to southern Tasmania in developing a vision for future waste management.

5.1 Guiding Principles

In developing a vision for the future, it is important to establish the guiding principles behind the approach to waste management in southern Tasmania.

The waste management hierarchy (refer Figure 5.1) is the underlying principle of waste management in Australia, including the *Tasmanian Waste and Resource Management Strategy 2009*. This principle prioritises, where practicable, initiatives that avoid and reduce waste generation ahead of reuse and recycling; treatment and disposal of waste to landfill is the least preferred option.

Figure 5.1 Waste Management Hierarchy



Other guiding principles of the *Tasmanian Waste and Resource Management Strategy 2009* include:

- Environmental stewardship: Tasmanians' responsibility to effectively manage waste to reduce any adverse environmental impacts and protect the environment for current and future generations.
- Precautionary principle: A precautionary approach to waste management to protect the environment and human health and safety, ensuring lack of scientific certainty does not inhibit actions to reduce risk.

- Life-cycle principle: A life-cycle assessment approach to the impact of waste, incorporating raw material production, manufacture, distribution, use, disposal and transport.
- Polluter pays and user pays principles: Those generating waste or causing pollution should bear the cost of treatment and/or disposal, and users of waste services similarly have responsibility for paying for those services.

These principles have been adopted in creating a waste management vision for southern Tasmania.

5.2 Waste Challenges & Opportunities

Waste and resource management in southern Tasmania operates within the context of a range of local circumstances, including historic practices in landfill siting and operation, the state's demographic profile (including low population base, low density and low growth), an island location, with most resource markets located off-shore (mainland or international), and an economic base with limited industry presence. These challenges are balanced by a range of positive factors, such as a government and population committed to environmental protection, opportunities for specific targeting of community education on waste and resource management, and recognition that local solutions dictated by distance to markets/island issues are more sustainable. Options for the future need to recognise the issues, barriers, challenges and opportunities applicable to southern Tasmania.

Minimising Waste

In the waste management hierarchy, waste challenges begin with avoiding and reducing the amount of waste generated. While data on waste generated in southern Tasmania is imperfect, the trend of existing data between 2002/03 and 2009/10 (as shown in Figure 3.3) outlines an upward increase in landfilled waste. There is insufficient data to match this with programs undertaken by SWSA to determine what impact (if any) particular activities have had on total waste generation trends. However the experience of interstate organisations (discussed in Section 4.2) indicates that SWSA education initiatives would need to be more widespread and consistently reinforced over a longer period before reductions are realistically achieved.

There are a number of areas that local government waste avoidance programs can target to influence the behaviour of the community:

- Advocacy:
Community members generally look first to their local council for information on waste and recycling. There is an opportunity for councils to include information on ways to avoid waste through changes in consumption and purchasing behaviours. This can also benefit local economies (e.g. consideration of 'food miles' encourages purchase of local produce). Achievements in reduction and recovery of waste could be communicated to the community to raise awareness of waste issues and opportunities which the local community can build on. Community education programs should also address the increasing costs for waste management as environmental management practices improve. This may include regular articles in local papers, engagement with local community groups and postings on council and SWSA websites.

- **Government leadership:**
 Councils have the opportunity to apply waste reduction to their own activities. SWSA could play a role in identifying opportunities to avoid and recycle waste and increase the purchase of recycled content products by councils. This could be part of a regional procurement program, with the development of green purchasing policies for implementation by SWSA member councils. Council responsibilities for local issues such as planning and building could also be engaged to encourage and/or enforce environmental considerations which reduce the amount of waste generated. This could include a requirement for all planning applications for medium- to large-scale developments to develop a waste minimisation and management plan which addresses the impacts of construction as well as on-going operations once construction is complete.

- **Charging mechanisms:**
 Waste management charges can be structured to make users aware of and accountable for the quantities of waste they dispose of. Systems can be structured so that payment is associated with collection frequency, volume or weight. Typically user pays charges are applied to garbage only, in order to encourage recycling as well as waste avoidance.

A frequency-based charge encourages users to reduce the number of times bins are put out for collection. A standard charge is usually established covering a set number of collections, and rebates awarded for less use or higher charges applied for more use. Bins need to be fitted with microchips that can identify bins and track collection dates and times, and a robust record-keeping system established. A pay-by-volume system charges by the size of bins presented for collection. A default bin size is provided, but users can ask for a smaller or larger bin that attracts a corresponding smaller or larger fee. In pay-by-weight systems, trucks are equipped with scales and bins are equipped with microchips to allow charging by weight. This latter system may be more feasible in the future as the technical challenges in accurately weighing bins are resolved, and potential neighbourhood conflicts (over perceived or actual use of others' bins to avoid cost) are overcome.

Material Collection & Recovery

Figure 3.5 shows there has been mixed success in kerbside recovery initiatives across southern Tasmania, with the region achieving around 20% diversion of domestic garbage in 2009/10. The actual amount of material recovered and recycled is thought to be more, however as a number of councils do not keep records on the achievements of their recycling programs, this cannot be quantified. The amount of readily recyclable material that is not captured in existing recycling programs is also not known. The lack of measurement makes it difficult to know whether recycling programs are being properly targeted or whether SWSA and member council programs have been successful in increasing the diversion of materials to recovery programs over time.

There is a need for a much better database on waste and recycling to measure the source, type and amount of material being generated and recovered, and to monitor progress against waste management and resource recovery targets. While landfill operators are obliged to report to the EPA on the amount of waste landfilled, it was clear during the course of this investigation that there is still some confusion in some quarters on the composition of these figures. A number of councils do not collect data on the amount of kerbside recyclables collected and/or do not require their contractors to provide such information to them. The supply of this data should be a standard contract provision.

As well as tracking the amount of recyclable material, it is also important to assess how much potentially recyclable material remains in the waste stream. This provides information on how successful diversion programs are, and whether further targeting of community education programs is needed. Consideration should therefore also be given to a series of regular audits of domestic garbage. This may be more feasible as a regional project, allowing sampling at the same time across different council areas to provide additional information on the geographical spread and success of programs with different communities.

The current kerbside recycling collection services provided by SWSA member councils lack consistency across the region. Huon Valley does not have a kerbside recycling service, and four councils (Central Highlands, Derwent Valley, Southern Midlands and Tasman) use a crate rather than a MGB. Interstate experience has shown that crates divert much less recyclable material than MGBs and generate more litter; while initially some increase in contamination rates may be experienced with MGBs, additional community education has generally alleviated the problem. There is also inconsistency in the type of materials currently collected across the region. Southern Midlands does not recycle paper and cardboard. The four councils using crates also have limited types of plastics (1 to 3) accepted as part of their collection service, while those using MGBs have an expanded range (1 to 7). Consistency in the use of an MGB and an expanded range of recovered materials would see increased diversion of waste materials in southern Tasmania. It is understood that Huon Valley is considering the introduction of a kerbside recycling collection service in the future. The experience of other councils should be used as a learning exercise in order to optimise the recovery and ensure the most efficient service is introduced.

Garden and food organics can make up around 60% by weight of the domestic waste stream (with food contributing 40-50% and garden 5-20% depending on the size of MGBs provided). Major reductions in landfilled waste can only be achieved with the diversion of organic material to alternative processing options. Options for processing are discussed in later pages (see Waste Treatment & Processing). Reduction of organics in MSW can be achieved by promoting home composting and practices that reduce food and garden organics (e.g. storing food to reduce wastage, reducing lawn areas).

Greater organics recovery will be achieved with a bin-based collection service than the current tied and bundled service offered by some SWSA member councils. However collection of organics may not be cost-effective in some cases, especially in rural areas and where residents undertake home composting, and metropolitan areas with minimal or no garden space. It may be more equitable to offer a voluntary rather than a compulsory organics collection service. To maximise cost-effectiveness and environmental benefit, a high take-up of a bin service would be needed, although users could be asked to contribute to the cost of the service (e.g. through purchase of the bin and/or a flat fee for a set number of collections each year).

A similar cost-recovery approach could be used in the collection of food organics. This includes offering the service for voluntary participation, with the purchase of the kitchen bin at the cost of users. The same MGB could be used for collection of food and garden organics, with bin costs and collection fees covering both organic streams.

E-waste is recognised as a growing waste problem in southern Tasmania and some recovery already occurs. Finalisation of the product stewardship scheme for televisions and computers is expected to occur in 2011/12 with enactment of the relevant commonwealth legislation and release of the Australian Standard and *Code of Practice for Management of End-of-life Televisions*. E-waste recovery

and recycling systems are expected to be strengthened at this time with funding support from industry. Opportunities for e-waste recovery are expected to become more viable in southern Tasmania once the PSS is in place.

Resale centres in southern Tasmania appear to be particularly successful. While comparison figures with centres in other states are not available, inspection of facilities in NSW, Qld, SA and Victoria shows that some resale centres in southern Tasmania recover and re-sell a wider range of material, some at much higher retail prices, and appear to have a higher rate of material turnover. Resale centres in southern Tasmania appear to be an example of a successful local solution, and continued support is warranted.

C&I Sector

The C&I sector remains largely disengaged from SWSA and member councils on waste and recycling issues. Waste estimates (discussed in Section 3.2) show that approximately 65% of waste in southern Tasmania is generated by the C&I and C&D sector. C&I waste represents the majority of waste deposited at the Copping landfill and records show the amount has been increasing in recent years. Reducing waste can offer significant cost savings to businesses, helping to make companies more commercially viable and supporting the local economy. It is therefore important for SWSA to establish a cooperative approach with business and industry to achieve waste minimisation and recovery in this sector.

Opportunities for waste minimisation and resource recovery will differ markedly for each industry sector. DPIPWE has a history of engagement with industry on cleaner production issues, and it is not the role of local government to provide expertise in this area. However there are opportunities for local government to play a facilitation role, promoting waste minimisation education and providing information on recovery opportunities. Examples of this may include:

- establishing a regular dialogue of industry representatives with the SWSA board and/or technical officers
- facilitating an industry waste network which offers businesses a chance to learn from each other's waste minimisation and recovery experiences.

There appears to be considerable potential for increased recovery of C&D waste. Materials such as concrete, bricks, tiles, timber, clean fill and garden organics are readily recyclable. Other materials such as asbestos and plasterboard can be hazardous to human health or landfill liners, and should be diverted from landfills. Further investigation should be undertaken to determine the volume and composition of C&D waste in southern Tasmania, and identify the feasibility of recovery and processing, and the size and location of potential markets for recovered material.

SWSA should develop an understanding of the major C&I waste streams in southern Tasmania; this may be developed through industry surveys and audits of C&I waste deposited at landfills. SWSA could collaborate with Copping landfill to identify C&I waste streams deposited there. Upon identification of significant waste streams, either by component or source, appropriate reduction strategies should be developed; this may be undertaken in association with various industry associations acting on behalf of their members.

Greenhouse Emissions

The main greenhouse gas arising from waste is methane (CH₄) emitted from anaerobic decomposition of organic material in landfill. Methane is a potent greenhouse gas with around 21 times the global warming potential of carbon dioxide (CO₂). The waste sector represents approximately 3% of Australia’s total greenhouse emissions, with less than 30% of methane from landfills estimated to be recovered (DCCEE 2009).

While previous moves to introduce the Carbon Pollution Reduction Scheme foundered, the Australian Government has outlined its commitment to introduce a carbon price in 2011. There is much uncertainty around the form that this will take and the likely impacts on the waste sector, once political manoeuvring determines the final outcome. Some sectors in the waste industry are lobbying for waste to be excluded from carbon pricing arrangements, and this may also be a possibility.

However if a carbon price on waste is established, this is likely to result in an additional financial impost on landfilled waste. Different waste types are likely to have a higher or lower percentage of organic waste, and consequently higher or lower emissions of methane from biodegradation in landfills. If a carbon price of \$20 per tonne CO₂e is established, then calculations suggest the price for different waste types (based on their average organic component) is likely to be in the order of \$28 per tonne of MSW, \$26 per tonne of C&I waste and \$4 per tonne of C&D waste. Even if a carbon price on waste is not established, complementary measures are likely that have a similar effect.

This cost will be reflected throughout the chain of waste generation and management, and is expected to drive demand for emission reductions both at council and industry level. The carbon price differential between wastes with high and low organic loads is likely to exert cost pressures for additional infrastructure and services as follows:

Carbon cost pressure	Potential outcome
<ul style="list-style-type: none"> ▪ Separation of inert waste from putrescible waste ▪ Processing of organic waste by technologies such as composting or digestion ▪ Capture or flaring of methane generate by landfills 	<ul style="list-style-type: none"> ▪ Infrastructure for segregation and recycling of C&D waste ▪ Collection services and infrastructure for organic processing (may become more cost-competitive compared to low-cost disposal at landfill) ▪ Increased landfill gas infrastructure (may be off-set by recovery and sale of energy)

Waste Treatment & Processing

There is a range of WTTs which can be utilised for treatment of waste but not all are suitable to the situation in southern Tasmania. Some are still in the process of being commercially proven for treatment of MSW in Australia, with the experience of WTTs in NSW not always successful either technologically or financially.

For commercial viability, thermal treatment facilities generally require at least 100,000 tonnes per annum of waste feedstock (although it is not uncommon for European facilities to have throughputs of over three times that amount). While an estimated 216,000 tonnes of waste was landfilled in 2009/10

in southern Tasmania, not all of this would be suitable for treatment. Some of this waste stream may be readily recoverable at a much lower unit cost than WTT processing; other materials may need to be separated from the treatment feedstock (e.g. hazardous household and industrial chemicals, materials containing heavy metals such as mercury and lead) to maintain the efficacy of the process. This is likely to reduce the total potential feedstock in southern Tasmania much closer to the 100,000 tonnes/year threshold needed for a viable facility. This figure also includes the waste currently being directed to Copping landfill. Therefore a viable thermal treatment facility may be dependent on all 12 SWSA member councils agreeing to direct their waste to a single facility, as well as Copping agreement to stop accepting waste for landfilling. This is an unlikely scenario.

The cost of treatment is another WTT hurdle. In Australia, the high capital costs for developing a WTT facility have generally been transferred by councils to the private sector by a long term contract (20-25 years) for treatment of MSW. However as part of that agreement, councils agree to a set fee per tonne of waste accepted. The gate fee must be competitive to both councils and the C&I sector in order to attract the volumes needed; if much lower cost alternatives are available, market competition will result in the WTT becoming unviable.

Current landfill gate fees applicable in Glenorchy and Hobart are \$51 and \$58 respectively per tonne of mixed waste (other fees apply to other waste types). The gate fee charged at Copping landfill varies with different customers; while the range is not known (for commercial-in-confidence reasons), it is believed to partly undercut Glenorchy and Hobart fees. These fees are cheaper than landfills in most mainland states, with gate fees per tonne of mixed waste in the order of \$80-100 in Adelaide, \$85-120 in Melbourne, \$100-120 in Perth and \$200-220 in Sydney. Sydney and Perth are the locations with the highest number of established or proposed WTTs, and this is in line with the high landfill gate fees applied there. Gate fees for technologies such as pyrolysis and gasification are in the order of \$130-300 per tonne, significantly greater than current landfill disposal costs in southern Tasmania. This cost differential makes these WTTs untenable in southern Tasmania.

However the cost of 'low tech' technologies such as composting and digestion is lower than thermal WTTs; they can also be viable at lower annual waste throughputs. Most of the WTTs established to date in Australia are based on these processes, and there may also be a similar opportunity in southern Tasmania.

Anaerobic digestion and fermentation require much higher capital outlay than compost processes (resulting in gate fees of around \$100-140 per tonne), and these technologies too may be outside what is viable in southern Tasmania. However there are feasible opportunities in the region for different methods of composting (e.g. open windrow, enclosed, static pile) to be used to treat organic waste.

Hobart City Council composts some garden organics at their landfill site, and Kingborough Council will be undertaking a composting trial at Barretta. There is also an existing compost facility operated by a private company (at Oatlands) which does not currently source organic material from SWSA member councils (although it is understood to accept some food organics from a Hobart residential collection service operated independently by a private company). There may be opportunities to utilise these existing facilities as processing points for additional organics streams. Alternatively there may be opportunities to establish a regional compost facility, or a number of sub-regional facilities spread across southern Tasmania. This would be subject to the actual volumes of food and garden organics generated in each council area (which should be determined by waste audits), the availability of other organic

waste streams (such as biosolids, greasetrap sludges and industrial organics), the cost of collection, transport and processing, and the availability of markets. This would need further detailed analysis and would best be undertaken as a SWSA regional investigation.

Landfills

Landfill standards for siting, design, operation and rehabilitation are clearly outlined in the *Landfill Sustainability Guide* (DPIWE 2004). While the guide is not a legally enforceable document, standards contained in the guide form the basis for conditions included in landfill permits and become enforceable in this way. The hierarchy of waste minimisation and avoidance ahead of recycling and disposal is a fundamental approach of the *Landfill Sustainability Guide*.

The *Landfill Sustainability Guide* categorises landfills as follows:

- Category A: solid inert landfill
- Category B: putrescible landfill
- Category C: secure landfill (which can accept contaminated soil and controlled waste).

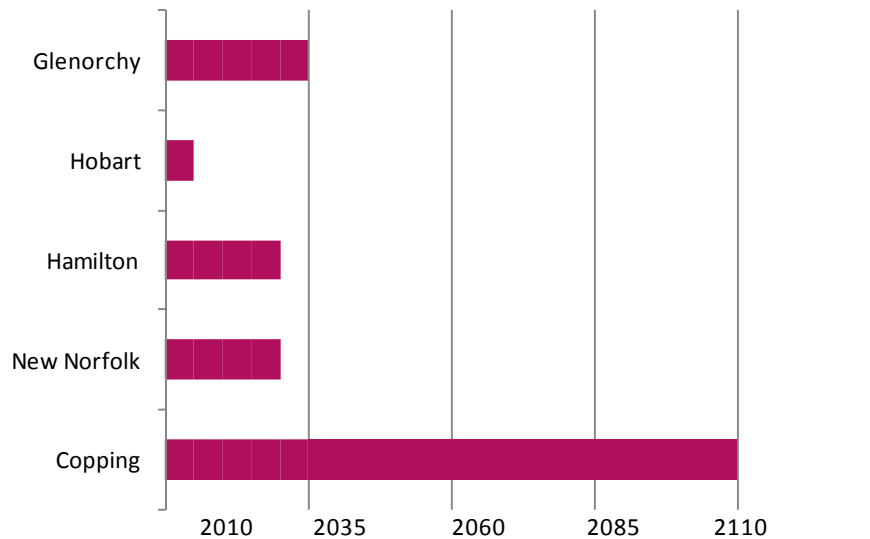
The required engineering and environmental protection measures increase according to the landfill category. The guide incorporates a range of measures to address potential issues such as groundwater and surface water impacts, hydrogeology, greenhouse gas emissions, community amenity, flora and fauna impacts, traffic management, rehabilitation and aftercare. The guide also outlines reporting and requirements, including a requirement for landfill owners to completely review their environmental management plan every five years.

The *Landfill Sustainability Guide* reflected best practice requirements for Tasmanian landfills when it was published in 2004, however best practice is a continual improvement process, and improved landfill operation and management practices will likely be established over time. In the future, landfill owners and operators can expect increased scrutiny of management practices, a requirement for enhanced environmental protection measures, and consequently increased operating and rehabilitation costs. It would therefore be advantageous to assess existing landfills against the guide to identify areas where improvements can be made. This benchmarking against best practice should also extend to transfer stations and resource recovery centres in southern Tasmania.

Despite EPA reporting requirements, there remains some uncertainty about the actual amount of waste deposited at some landfills in southern Tasmania. This was evidenced by a number of gaps in information available for this review. Better management of waste will be facilitated by better measurement systems, particularly those that record the amount, type and source of generation of waste and the amount and type of material recovered. While weighbridges will give the most accurate data by weight of incoming waste, a regime of regular volumetric surveys of landfills will improve on current data at small landfills where installation of weighbridges is not economically feasible at present.

The lifespan of landfills in southern Tasmania will be dependent on the rate of filling and the amount of waste generated, however based on current information the estimated lifespan of landfills in southern Tasmania is shown in Figure 5.2. There is a possibility that extensions at Hamilton and Copping may extend the current lifespan estimates.

Figure 5.2 Landfills Estimated Lifespan



There will be a continuing need for landfill disposal at some level in southern Tasmania, and it is important that facilities are available to meet this need. However with future successes in increased resource recovery, the capacity needed is likely to diminish. Given the economic, social and environmental impacts of landfills, it is equally important not to oversupply the infrastructure. Too many landfills competing for a reducing waste stream can undercut waste minimisation efforts and landfill management standards. Long term planning for landfills should therefore consider whether rationalisation of landfills is needed.

Hobart landfill has a limited lifespan, with capacity expected to be reached around 2016; this could be extended if putrescible waste is diverted elsewhere and it becomes an inert waste only landfill. Glenorchy has a longer lifespan but environmental protection reasons, together with pressure from surrounding residents and a growing population, is likely to mean closure of the landfill before its airspace is exhausted. New Norfolk and Hamilton landfills have a long lifespan, but either's suitability as a regional landfill would depend on the economics of transporting waste from other areas of generation in southern Tasmania, as well as the site's engineering capacities, hydrogeological profile and other site-specific features.

While Copping landfill has a long lifespan, it should not necessarily become the sole regional landfill by default. It is located approximately 50 km from the population centroid of Hobart, where the greatest amount of waste is generated. The distance and transport costs involved, the ability of the roads to cope with increased heavy vehicle traffic, and the willingness of the local population to accept increased traffic has not been tested. Similarly, the question of whether retaining Hamilton and New Norfolk landfills (respectively 75 km and 35 km from Hobart) is more cost-effective to the relevant local councils (and the region as a whole) than transporting waste to Glenorchy or Copping landfill has not been tested: it may be that the total cost of ongoing operation and future rehabilitation and management is more than the cost of transporting waste for disposal at a regional landfill.

Further regional landfill investigations are needed to be undertaken to assess:

- future projections of landfill airspace needed (including likely achievements of waste minimisation programs)
- each landfill site's capabilities (including engineering profile, compaction rate, operating and management characteristics)
- waste generation centres and transport needs
- potential greenhouse emissions and carbon price impacts
- economic analysis of transport options, landfill operation & management costs and cost recovery.

This information will assist SWSA and member councils in determining the optimum path for landfill planning in the region.

Litter & Illegal Dumping

Although there is no data on the extent of litter and illegal dumping in southern Tasmania, NLI statistics (refer Section 4.7) show that Tasmania as a state faces a growing litter problem. This is not an issue that SWSA or member councils can address in isolation, and a cooperative approach with state government, other WMGs, environment groups, local communities and industry is needed.

Many councils around Australia have experienced illegal dumping issues when changes to waste management are made, e.g. changing hours of operation of waste facilities, closure of landfills. However experience shows that with additional communication and enforcement activities these issues can be overcome. The majority of the general public looks to do the right thing in waste disposal, and strategies that focus on reinforcing social norms are generally successful. This may include:

- greater enforcement of local laws and a practice of 'naming and shaming' offenders penalised (e.g. in local papers)
- raising awareness of litter issues in the community through media campaigns, including encouraging the public to identify and 'dob in' litterers
- involvement of community action groups and businesses to clean up litter (e.g. on 'clean up' or environmental action days, as part of business volunteer strategies, adoption of neighbouring areas).

Southern Tasmania could expect to see reduced litter rates from the introduction of MGBs for recycling instead of crates. The introduction of CDS has proven to be a successful strategy in reducing litter, however this would be subject to the state government's policy position for implementation.

5.3 Management Structures

An effective governance structure with sufficient on-going funding and resources available will be important to deliver waste and recycling improvements in southern Tasmania.

Regional Waste Group

Consultation with SWSA member councils showed that there was general concurrence for a regional approach to waste management. While a move to have waste incorporated into STCA responsibilities was proposed by some, this position would not appear to have widespread support. There is also no evidence that STCA have the appetite to increase the scope of their current responsibilities.

Stakeholders generally considered there was a need for a regional organisation with a sole focus on waste issues, rather than incorporated with a range of other issues that are the responsibility of local government. While there were seen to be some advantages for incorporation of waste under the umbrella of the STCA, the majority of stakeholders consulted believed waste issues were sufficiently important and complex to warrant specialised management.

However there was some dissatisfaction with SWSA in its current operational guise, with a number of issues identified around a perceived lack of strategic leadership by SWSA, deficiencies in the current strategic plan and delivery against planned objectives, gaps in communication between SWSA and its member councils and opportunities for enhanced performance by staff and board members. There was acknowledgement by a number of stakeholders that the main drivers for initial formation of SWSA were to maintain local government control of waste management and oppose the introduction of a state government waste levy; there was equal recognition that this was generally not a good policy reason to form an organisation. Stakeholders also acknowledged that expectations of SWSA's role had changed over time, and that the past (and current) organisational ethos did not reflect their future aspirations for the organisation.

There were mixed expectations of the future role of SWSA although some common themes were expressed around opportunities for:

- strategic consideration of waste and resource issues common to all Tasmanian councils
- expertise and up-to-date knowledge on waste/recovery industry trends and best practice (especially to overcome limited resources of small councils and lack of waste expertise generally in Tasmania)
- research projects to determine feasible options and optimum outcomes for regional and municipal waste initiatives
- regional and/or sub-regional contracts for collection services, recovery programs, facility operations, etc to achieve economies of scale
- provision of relevant guides and templates to member councils
- coordinated communication and education programs
- information-sharing networks which build waste/recovery knowledge and capacity within member councils.

In order to deliver on these aspirations, changes to the areas of SWSA responsibility would need to be put in place and adequately resourced. The current SWSA rules of governance (established in 2001) have minimal description of the waste functions of the organisation (refer Section 2.1) but provide more detail on membership, powers and meeting procedures. In order to establish the parameters of a future role for SWSA, additional detail should be developed and agreed by member councils; this should be documented in a new charter of corporate governance. The charter could incorporate expanded detail on the waste-related functions and responsibilities of SWSA such as:

Functions:

- to plan for the management of municipal waste in the region in partnership with member councils
- to coordinate the activities of member councils that implement state and regional policies, strategies and programs relating to waste
- to facilitate and foster best practice in waste management.

SWSA responsibilities:

- plan for municipal waste management in the region including:
 - preparing and keeping up to date a regional waste management plan
 - implementing and promoting the plan
 - setting performance targets for municipal waste minimisation programs
 - developing, implementing, supporting and promoting municipal waste minimisation and recycling programs
- coordinate the waste management activities of its members including:
 - introducing measures that lead to conformity of standards for waste minimisation, waste management and litter prevention and control between member councils
 - investigating and advising on landfill disposal costs and charges in the region
 - encouraging the training of staff involved in municipal waste management
- promote, commission and undertake research into waste management and resource recovery
- advise its members on best practices in municipal waste management
- promote improved waste management technologies
- promote and coordinate relevant community education in the region.

Additional topics that should be addressed by the charter include (but are not limited to):

- the roles and responsibilities of SWSA board members, the SWSA chairperson and the CEO
- the induction process for new SWSA board members (including introductory waste education)
- a process for monitoring board and CEO performance (including a process to be followed in the event of under-performance)
- a process for addressing disputes and providing mediation
- apportionment of costs incurred (not otherwise funded)
- internal administrative and financial controls (e.g. register of interests/gifts accepted, code of conduct, delegated authorities)
- a process for monitoring compliance with and review of the regional waste management plan, including a program for completion of key actions
- a process for provision of external advice to the board as required.

The charter may also refer to supplementary documents, which would allow adjustment from time to time without amending the charter, such as:

- items to be addressed in the annual business plan and reported on in the annual report (allowing greater linkage between planned actions and outcomes)
- job descriptions of other SWSA staff
- organisational communications policy (outlining authorisation process for public statements and press releases)
- ongoing professional development policy for SWSA board members and staff (including education opportunities for councillors other than SWSA representatives)
- internal audit procedures
- expenses policy for board members and staff
- list of stakeholders with whom regular communication and interaction will be maintained (e.g. government agencies, other regional waste groups, industry associations, community groups, education institutions, companies and organisations in the waste/recycling industry).

In addition to the member council representatives on the SWSA board, there may be benefits of allowing the appointment of skills-based board members to supplement council expertise from time to time; this may include waste/recycling expertise as well as wider industry sector representation. As the skills-based board members would not have the capacity to represent council interests, they may have non-voting or restricted voting rights on specific issues (e.g. council spending on infrastructure). This would also need to be reflected in the charter of corporate governance.

The expanded functions and responsibilities included in the corporate governance charter (and supplementary organisational policies) would need to be reflected in amendments to the current management and reporting systems in place in SWSA. Upon establishment of the amended responsibilities, a new strategic plan should be developed.

The Local Government Board (LGB) undertook a review of SWSA in 2008 and included in its preliminary report (LGB undated) a number of sound recommendations around meeting attendance and reporting back to member councils, which should also be addressed in amendments to SWSA rules and the corporate governance charter. However the LGB also made a recommendation on considering potential amalgamation of SWSA with the Copping landfill authority; this is not considered the optimal outcome for waste planning in southern Tasmania. While a close working relationship between both bodies is good policy, there is a fundamental difference between their objectives. The Copping landfill authority has a financial interest in maximising revenue by maximising waste disposed to landfill. This is in opposition to the waste minimisation responsibilities of SWSA and the recommended guiding principles. Incorporating both objectives within the same organisation would result in a fundamental internal conflict of interest.

As a regional authority, there is also an important role that SWSA would play in planning for waste and recovery facilities in the future. Subject to the consent of the state government, this could be embedded in planning regulations by establishing SWSA as a referral authority for all such facilities in the region. This would ensure that SWSA has a voice in the number and location of facilities such that long term planning for regional waste management (including the regional waste management plan) is not undermined. It is therefore important that SWSA is seen as independent by proponents in the waste/recovery industry. Private companies proposing development of landfills or resource recovery centres will be deterred from engagement with SWSA if the organisation is seen to be competing in their core area of business. This would have negative long-term impacts on waste minimisation and management in the region.

During the consultation some stakeholders suggested the possibility that SWSA could in future take responsibility for ownership and/or operation of existing waste facilities in southern Tasmania. However, similar conflict of interest issues would apply. If SWSA was partly reliant on the revenue raised by operating waste disposal facilities or was involved in a waste activity that did not deliver on core waste minimisation principles, then the organisation's capacity to engage the community in waste minimisation programs would be significantly undermined. Similarly, there would be a collision of interests if SWSA was operating facilities in direct competition with the private sector, while potentially encouraging private sector engagement in waste/recovery initiatives as part of its strategic planning responsibilities. This would likely result in further disengagement of private sector involvement in the Tasmanian waste/recovery industry, which in turn could mean increased devolvement to council of C&I waste and controlled waste management, reduced opportunities for material recovery, higher commodity risks for recovered materials and increased costs. For these reasons, it is seen as important

to maintain the separation between SWSA planning responsibilities and council operation of facilities. However it is important that SWSA has a good understanding of the cost structures underpinning member councils' waste operations. Establishment by SWSA of a regional database of waste costs incurred by councils would provide a greater understanding of the financial feasibility of new initiatives at local government level.

Statewide Collaboration

In order to achieve the most effective and cost-efficient outcome for waste management in southern Tasmania, cooperation with other stakeholders is vital.

The two regional waste groups in the north (Northern Tasmania WMG) and north-west (Cradle Coast WMG) of the state are working towards similar ends as SWSA, and collaboration on a range of common issues is widely recognised as being valuable. SWSA has already collaborated with the Northern Tasmania and Cradle Coast WMGs in the establishment of the combined website <http://taswaste.com.au>, offering development and operation cost savings to all three groups. The combined website also facilitates the communication of common waste messages to all Tasmanians. There are a number of other programs that offer potential for collaboration between the three groups, including responsibilities co-allocated to local government in the *Tasmanian Waste and Resource Management Strategy* (DEPHA 2009) such as:

- working with industry to encourage innovation in product design and manufacturing to avoid waste generation
- development of industry sector-based approaches to provide guidance on waste and recovery issues.

There is a range of additional opportunities for collaboration between the three groups, some of which include:

- development of community information and education strategies
- design of generic waste/recovery brochure templates
- development of green purchasing policies for implementation by WMGs and member councils, including information on local manufactures with recycled content
- development of templates to be used by member councils when requiring project developers to prepare waste minimisation and management plans as part of planning application requirements
- cooperation with waste and recovery industry to assist development of innovative local waste solutions
- development of preferred service guidelines, best practice guides and codes of practice relevant to waste and resource recovery
- cooperative market development strategies for selected materials recovered
- coordination of infrastructure development, particularly in border areas
- inclusion as a stakeholder in development of regional waste management plans
- lobbying of state government, industry or other stakeholders on agreed policy positions.

Some matters may be more relevant to one group than another, resulting in one WMG taking the lead management of a particular program; however this should be done with the support and ongoing cooperation of the other WMGs. There is also a role for cooperation with the EPA in these activities.

It is understood that there are already frequent discussions held between the three WMGs, including by their representatives as part of the WAC. It may be advisable to establish a program of regular meetings between the three WMGs to ensure that targeted discussion can occur on matters that relate to the WMGs, rather than WAC or other bodies. This may include quarterly meetings of the relevant CEOs, together with annual meetings of the combined board members. At the discretion of the WMGs, the meetings may also incorporate guest speakers to provide an overview of relevant matters to all three WMGs.

SWSA should actively collaborate with state government agencies (discussed in the following section). There is a range of other statewide stakeholders that SWSA should also engage with on a regular basis; these include:

- LGAT (with particular reference to the household hazardous waste management program, and broader council issues)
- Tasmanian representatives of waste/recovery organisations such as the Waste Management Association of Australia, Australian Council of Recyclers and Packaging Stewardship Forum
- waste/recovery companies, other industry associations, chambers of commerce
- community environment and sustainability groups.

Consideration should be given to structured methods of engagement by SWSA with these groups, including the potential for embedding representatives into the program of WMG meetings and/or as a community consultative committee.

State Government

Local government waste management operations are bound by regulations administered by the state government. These include the *Environmental Management and Pollution Control Act 1994*, the *Landfill Sustainability Guide* and various other measures. Comment by some stakeholders indicated a level of dissatisfaction with DPIPWE's lack of enforcement of waste regulations; there was a view that a lack of resources led to different application of legal requirements in some circumstances. It is to the advantage of local government and all waste industry participants that the regulations are uniformly applied, and that all stakeholders operate within the same regulatory framework. This ensures that efforts to achieve best practice are not undermined by the poor practices of other operators or affected by generators opting for cheap disposal options that undercut the financial viability of reputable operators in the industry.

In 2009 the Tasmanian Government released the *Tasmanian Waste and Resource Management Strategy* (DEPHA 2009). The strategy outlines a new approach of active engagement by the state government in waste minimisation and resource recovery, and its objectives can only be achieved by state and local government working in cooperation. It would appear that progress has been slow since the strategy was released. Formation of the WAC was a recommendation of the strategy and this has been done, however many of the other outlined initiatives are hampered by a lack of resourcing. In most other Australian states, state government waste initiatives were funded by the introduction of a waste levy. This may yet be introduced by the Tasmanian Government.

State government will be seeking commitments from a range of sectors to action elements of the strategy for which they are deemed responsible. At a local government level they would expect a high

degree of coordination among the three WMGs to deliver programs across the state. Similarly they would expect the WMGs to liaise with industry to ensure opportunities for minimisation and recovery are explored with that sector.

The Tasmanian Government also has expectations placed on it by the Commonwealth Government arising from the *National Waste Policy*, which would have implications for local government. One example is waste data. All states feed waste data into a Commonwealth database, and the Tasmanian Government seeks this data from local government for aggregation into a statewide figure. While landfill reports are currently provided to DPIPWE, there are gaps and inaccuracies in the information with respect to resource recovery. Local government could expect to see further data requests from state government as it widens and improves this data in the future. Additional national issues such as product stewardship schemes (including packaging, e-waste and tyres), greenhouse emissions, hazardous waste management and transport are likely to require consideration by SWSA in the near future. SWSA should pro-actively develop a policy position on these issues in southern Tasmania to ensure it understands how these issues affect the local region and can actively engage in the debate as it occurs.

There are a number of outstanding waste issues to be considered at a political level: the slow implementation of the state waste strategy, the potential introduction of container deposit legislation, the high Tasmanian results in national litter audits, to name just a few. Given the recent change of Ministers, these issues and others are still being considered by state government to determine what action (if any) is an appropriate response. There is a narrow window of opportunity open to local government to engage with the new Minister and provide direction on preferred approaches; the failure of local government to act in this timeframe leaves it open to the risk of unilateral state government decisions on waste management which may not adequately address local government issues.

Waste Levy

Current Arrangements

Funding of waste minimisation programs around Australia is primarily sourced by state government imposed waste levies. These levies provide the financial incentive to minimise waste and help to off-set the price difference between existing landfill disposal costs and the cost of introducing more innovative ways to manage residual waste. Like the Northern Tasmania and Cradle Coast WMGs, SWSA is funded by a notional \$2 per tonne fee voluntarily levied against member councils. However in some respects, the voluntary fee applied by SWSA member councils cannot be considered in a similar light as the levy. It is not advertised to waste generators, it does not apply to all landfilled waste and it does not provide any financial incentive to divert material from landfill. The current levy from member councils could be considered more in the light of a SWSA membership fee than a waste levy.

There are also anomalies in the voluntary levy's calculation and application in southern Tasmania. While notionally it is applied at the rate of \$2 per tonne, some adjustments have resulted in the actual levy imposed being less for most of SWSA's period of operation (ranging from \$1.18/tonne in 2002/03 to \$1.70/tonne in 2009/10). These adjustments have not necessarily been directly related to the amount of waste landfilled: they have variously related to additional funding from external sources (such as the NPC), transfer station use (based on estimated not actual recovery rates) and population statistics (where no weighbridges existed to measure landfilled waste). As a voluntary levy applied only by SWSA members, waste deposited at the Copping landfill was also excluded from calculation.

Copping landfill does not currently apply a waste levy to landfill gate fees paid by the facility users. Discussions with the Copping authority indicated that they have a number of long term (20 year) contracts with users (especially councils and waste management contractors) that incorporate set fees throughout the term of the contract, allowing for annual CPI increases and a review of the base fees only every 10 years. Under these contractual arrangements the levy could be incorporated in gate fees following the 10-yearly review period, however the review anniversary is spread over a number of years and there is no common date to allow application of a levy to all contracts at a given date. The only other avenue for applying the levy at Copping landfill to all users would be as a state government imposed fee, which would override any legal implications of raising fees above the price fixed in the contract.

For 2010/11 the voluntary levy contributes \$328,442 for SWSA funding and projects. There was acknowledgement during the stakeholder consultation that this amount was sufficient to pay staff costs, but insufficient to fund minimisation initiatives that would see fundamental changes in waste management in southern Tasmania. There was less direction on what amount of funding should be available to the group.

Increased SWSA funding could be generated by increasing the voluntary levy, however under current arrangements it would not apply to waste deposited at Copping landfill. This would undermine the structural planning for waste in the region. Market forces would see more waste directed to Copping landfill (as it would be cheaper to dispose there), with most waste in the region directed to Copping landfill when Glenorchy and Hobart landfills close. This would result in a significant reduction in levies paid to SWSA, and an increased burden on member councils to meet the revenue gap. The only way to avoid these perverse outcomes, and incorporate Copping landfill into any levy arrangements, is with the enactment of state government legislation.

For comparison purposes, regional waste groups around Australia were profiled for characteristics similar to SWSA. Of the two identified with similar populations (groups around Geelong, Victoria and Townsville, Qld), relevant financial data was only available on Barwon Regional WMG in Victoria. Information from Barwon Regional WMG's 2009/10 annual report (Barwon Regional WMG 2010) shows that annual revenue for the group increased from \$456,000 in 2004/05 to \$961,000 in 2009/10. The total depended on project-specific funding from year to year and included government funding of between \$310,000 in 2004/05 and \$661,000 in 2009/10; in the latter year almost \$249,000 of this was sourced directly from the landfill levy. Baseline administration costs were in the order of \$300,000-370,000 (including some consultancies), with the remainder allocated to special projects. This does not include infrastructure support funding which, while applications were facilitated by the Barwon Regional WMG, was paid directly by Sustainability Victoria to member councils. This comparison supports the view that SWSA's current revenue is sufficient for administration costs but little more. If a similar level of waste minimisation projects to Barwon was implemented by SWSA, it would appear SWSA funding would need to increase by a factor of at least three times the current voluntary levy (excluding Copping landfill waste).

A pragmatic assessment would indicate that funding for waste minimisation and resource recovery must come from somewhere, and that application of the 'user pays' principle would result in waste generators providing the necessary funds. A levy applied to landfilled waste is the most equitable way of apportioning the cost to waste generators, while also encouraging material segregation and recovery.

The political experience in Qld indicates that a waste levy may be an inevitable component of strategic waste planning by state government. Both Qld and Tasmania have lacked a state waste strategy for some years (unlike NSW, SA and Victoria which have developed a consistent theme in waste planning over a number of years). Both Qld and Tasmania have recently developed a new state waste strategy, and both state governments have limited funding to apply to waste management initiatives. Both state governments have also experienced opposition from local government to a waste levy; in Qld, political pressure has seen it limited to C&I waste, but a waste levy has still been introduced. In Tasmania, it is thought the implementation of the *Tasmanian Waste and Resource Management Strategy* has been slowed by a lack of funding. The most likely source of funding to implement the strategy is via a waste levy, and the state government has the power to introduce this unilaterally. The Qld experience indicates that local government may be more effective in influencing a levy's application than stopping its introduction.

Differentiation

In a number of Australian jurisdictions, a levy differentiated either by waste type or geographic source of generation has been implemented. In WA, where the levy is different for putrescible and inert waste, there is no evidence of differential outcomes; this may be due to the low levy applied, as well as the lack of coverage across the state. In Victoria, differentiation by waste type and location either has merged or is in the process of merging over time, i.e. different levies initially applied between MSW and C&I, and metropolitan and regional areas of generation, but trending towards the same fee. This has seen a marked increase in resource recovery in both metropolitan and regional areas, although it could be argued this relates to the distribution of levy funding towards recycling infrastructure rather than the application of the levy per se. An effect of differential pricing can be a distortion in how waste is reported. For example, when differential pricing was first introduced in Victoria, there was an appreciable increase in the amount of waste classified as 'municipal' by landfill operators (and a decrease in C&I and C&D waste) that could have been due to the lower levy applied to this stream.

Higher levies for prescribed industrial waste (or controlled waste) are quarantined in Victoria (and will be in Qld), with all funds directed to specific activities to reduce the generation and/or hazard of this type of waste. The higher fees are pitched to generate changes in production processes, rather than recovery initiatives. Lower levies for asbestos are specifically targeted to the residential sector to reduce the potential for illegal dumping or unsafe disposal of this material by home renovators and builders. Despite the initial levy differences, there is some commentary (Zero Waste SA 2007c) indicating a preference to keep levies simple with minimal differentiation, as there is a perception that every differentiation offers temptation for rorting the system. This is countered by the view that the levy should reflect treatment and disposal risk, and this is higher for C&I waste than MSW.

Hypothecation

There is a general industry view that any revenue raised from a waste levy should be spent on waste management issues. This accords with much of the policy rationale for waste levies: that waste generators fund waste minimisation initiatives. Much of the past opposition to waste levies around Australia has been concern that the levy may lose its focus on waste, and become just another source of on-going revenue for state government. As local government is responsible for MSW (approximately one third of the general waste stream) some councils believe it also reflects a cost-shifting strategy on behalf of state government. These claims cannot be verified when levy funds form part of state government consolidated revenue (as is the case in NSW) and there is a lack of transparency in how the funds are spent.

As discussed in Section 4.2, most state governments return at least part of their levy revenue to waste minimisation and management initiatives. The amounts differ from state to state, from 50% in SA to 74% in Qld; in Victoria fixed amounts apply and the percentage of total levy revenue is not known (although it was previously around 80%). All states apply a percentage to other environmental or sustainability initiatives; this may include non-waste issues as well as administration and operating expenses of the relevant statutory environmental authorities (e.g. EPA) and waste/recovery authority (e.g. Sustainability Victoria, Zero Waste SA).

Consultation with local government stakeholders for this project showed a strong and united view that, if a waste levy was introduced, 100% of the revenue should be directed to waste minimisation and management initiatives. A few stakeholders leavened this position with the view that a portion may be controlled by a state government body (such as the EPA) but should ultimately be spent only on waste issues, e.g. joint state and local government waste and resource projects.

Wide local government acceptance of a state-based waste levy is likely to be subject (among other things) to a transparent formula on the distribution of levy funds in accordance with the justification for establishing the levy: waste levies to fund improvements in waste management. Unless this is delivered in conjunction with a reporting process which makes it apparent to local government that the funding objectives are met, on-going support may also be undermined.

Ultimately, the distribution of any waste levy would be the subject of negotiation between state government and local government (and potentially other stakeholders). As part of the negotiation process, clarification may need to be sought on a definition agreeable to all parties on what is classified as a waste initiative; for example, whether it includes state government costs for establishing waste legislation, managing and enforcing waste levy arrangements, operating costs for development of a joint state/local government recovery authority. Similar agreement may need to be reached on whether guidelines for particular purposes of levy expenditure need to be established, e.g. agreed percentages of funding to infrastructure development, education programs or market development programs for recovered resources. There may also be funds earmarked solely for local government use, with additional funds available for waste projects upon application where local government may compete with industry and other sectors (as is the case in some other states). Such negotiations should be entered into with an understanding of the basic requirements for support, the implications of negotiated positions on all parties, and a pragmatic view towards implementation.

Amount

On a number of previous occasions the Tasmanian Government has proposed a waste levy of at least \$5 per tonne. In 2005 DPIWE proposed a formula for distribution of a waste levy which would have seen 30% of funding directed to the three WMGs and the remainder split between waste projects for industry, community, state-based and other projects. To date, these proposals have been rejected by local government; acting on behalf of member councils, LGAT has strongly opposed the introduction of a waste levy. Consultation with stakeholders indicated that this position may have shifted in recent times.

For a waste levy to be immediately successful in diverting waste from landfill, it needs to be high enough to make the alternatives (such as recycling or WTT) financially attractive. In order to match the cost of various WTTs (outlined in Table 4.2) with current landfill gate fees in southern Tasmania, a waste levy of around \$100 per tonne would need to be applied in Tasmania. This is not considered feasible.

The introduction of a high waste levy can be problematic both economically, politically and socially, and in most other jurisdictions has been staged over a number of years to allow incremental increases over time. These planned increases have generally been established and publicised well in advance of application (in some cases 5-7 years) in order to provide the level of certainty needed for business planning and infrastructure investment. This has been the case in other Australian states with a levy: no Australian jurisdiction introduced a levy amount that equated to the cost of WTT alternatives, and Sydney is the only area where the increases have reached such a level for MSW. Instead, the initial amount and annual increase has been determined based on willingness-to-pay considerations. There has also been some consideration of what other states pay; this is evident in the justification for the Qld levy (DERM 2010).

While there is no evidence of Tasmanians' willingness to pay, some stakeholders during this project indicated figures of \$5-10 per tonne could be considered. Some extrapolation of potential levy revenue based on these figures has been undertaken and is shown in Table 5.1, including differentiated levies for MSW and C&I waste. This modelling is based on the following assumptions:

- the amount of waste landfilled across Tasmania is approximately 451,000 tonnes/year, based on estimates of the three WMGs (this compares with 2006/07 estimates of 446,000 tonnes in the *National Waste Report*, EPHC 2010)
- MSW represents approximately 35% and C&I waste (including C&D waste) approximately 65% of landfilled waste (based on SWSA waste generation figures discussed in Section 3.2)
- 30% of revenue directed to the three WMGs (as previously proposed by DPIWE and generally consistent with the 32% to local government proposed in Qld)
- 49% of WMG revenue apportioned to SWSA (in line with ratio of population in southern Tasmania and as previously proposed by DPIWE)
- excludes controlled waste (as in other jurisdictions, any levy potentially segregated for controlled waste management activities only).

Table 5.1 shows the circumstances under which SWSA funding would increase from the current level at this scale of levy. In order to cover administration costs (in the order of \$300,000) and provide additional direct funding for waste minimisation projects, levies would need to be at least \$7.00 per tonne if applied universally, or higher if differentiated for MSW and C&I waste or applied only to C&I waste. The levy may be less if SWSA accessed additional funding out of the remaining 70% not specifically allocated to WMGs.

Note this assumes that tonnages to landfill will remain the same despite increased landfill gate fees. In reality an increased levy and levy-funded initiatives can be expected to reduce waste to landfill and reduce projected levy revenues. If applied differentially or solely to C&I waste, the total levy revenue may decrease significantly in the short term as low-cost opportunities for recovery of C&D waste are taken up and the amount of landfilled waste diminishes. This would indicate a higher levy may be needed in order to provide a sustainable level of funding, subject to any plan for annual increases in the amount of the levy. Further work is required to determine the likely impact of increased landfill gate fees on levels of resource recovery and corresponding reduction in landfill and levy revenues over time.

Table 5.1 Potential Levy Revenue

Option Category	Levy \$/tonne	Tonnes to landfill	Levy revenue	30% to WMGs	SWSA portion
All	\$7.00	451,000	\$3,157,000	\$947,100	\$464,079
All	\$10.00	451,000	\$4,510,000	\$1,353,000	\$662,970
All	\$12.00	451,000	\$5,412,000	\$1,623,600	\$795,564
MSW C&I	\$5.00 \$7.00	157,850 293,150	\$ 789,250 \$2,052,050	\$852,390	\$417,671
MSW C&I	\$7.00 \$10.00	157,850 293,150	\$1,104,950 \$2,931,500	\$1,210,935	\$593,358
MSW C&I	\$10.00 \$12.00	157,850 293,150	\$1,578,500 \$3,517,800	\$1,528,890	\$749,156
C&I only	\$10.00	293,150	\$2,931,500	\$879,450	\$430,931
C&I only	\$12.00	293,150	\$3,517,800	\$1,055,340	\$517,117
C&I only	\$15.00	293,150	\$4,397,250	\$1,319,175	\$646,396
C&I only	\$20.00	293,150	\$5,863,000	\$1,758,900	\$861,861

Implementation Considerations

Agreement on the introduction of a waste levy would require detailed discussions between state government, the three WMGs, LGAT and other waste industry, business and community stakeholders; a consensus is likely to take some time to negotiate.

Apart from agreement on the amount and application, there are a number of other issues that would need to be considered and/or actions undertaken to implement the scheme:

- development and enactment of the necessary state legislation (including preparation of a regulatory impact statement as appropriate)
- agreement on a framework for equitable distribution of levy revenue
- establishment of benchmarks for current landfill airspace to enable independent measurement of future filling rates
- development of IT and support systems to collect and administer the levy (including additional resources and training as necessary)
- strengthening of compliance and enforcement systems to address non-payment of levies or any increase in illegal dumping
- agreement on a starting date and a plan for future increases
- pre-publication of levy implementation to facilitate forward planning and budgeting by waste generators, waste industry and local government.

These activities are likely to take some time to complete, and may require a planning period of up to 2 years before the introduction of a levy. SWSA could not expect to see introduction of a waste levy before 1 July 2012.

If a levy is introduced only on C&I waste, the financial impacts on SWSA member councils may be limited; indeed councils may be better off as they would no longer need to fund SWSA. However the impacts will be much larger if a levy is applied to all waste, as councils will be responsible for levies applied to landfill disposal of municipal waste. Financing of this by councils may require rate increases and communities should be prepared for this by addressing increased waste management costs as an element of community education programs.

A new strategic plan should be developed by SWSA once the new funding arrangements are known.

6. ANALYSIS OF OPTIONS

This section considers a number of options for both waste management and governance to 2020 and beyond, and assesses them against economic, social, environmental and governance criteria. The options have been developed based on the investigations and analysis reported in previous chapters, as well as discussion with stakeholders undertaken as part of the consultation phase. The options identified are as follows:

Waste management options:

- WM1 Business as usual
- WM2 Climbing the waste hierarchy
- WM3 Enhanced regionalisation of services
- WM4 Enhanced regionalisation of infrastructure
- WM5 Residual waste processing infrastructure.

Governance options:

- G1 Business as usual
- G2 Enhanced regional approach
- G3 Local government
- G4 State recovery authority
- G5 Hybrid recovery authority.

Each option is assessed in terms of its usefulness for strategic waste planning to 2020 and beyond, and given a favourable or unfavourable rating. Performance against relevant criteria for all options is provided in Tables 6.1 and 6.2.

6.1 Waste Management Options

Each of the five options discussed and assessed below represent a potential focus for further development of waste management in southern Tasmania. The options are not intended to be mutually exclusive, except for the business as usual option (option WM1). Options WM2 to WM5 are presented only as a potential difference in emphasis, as the strategy for future waste management in southern Tasmania should be an integrated strategy, including elements of community education, recovery programs and recycling, and disposal infrastructure as appropriate.

Criteria used for assessing the options are:

- the estimated impact on **waste management costs** – including to households, but excluding the costs of any future greenhouse emission permits or abatement costs
- potential **logistical or contractual risks** – including the risk of stranded assets should outcomes be unexpected or contexts change
- the estimated extent of **diversion from landfill**
- **greenhouse gas emissions** – based on consideration across the life cycle of the materials and infrastructure
- other key **environmental impacts and risks** – including impacts associated with waste infrastructure and also the benefits of recycling in offsetting the need for production from virgin materials

- the extent of **reliance on behavioural change** by waste generators and the difficulty in achieving that change
- the degree of **coordination needed** between members.

Option WM1: Business As Usual

Under this option there are no major changes in regional approaches to waste management over the coming decade. Recycling systems operate similarly to those currently in place, the influence of regional considerations on council waste operations remains at present levels, and landfilling remains the technology of choice for the bulk of collected waste.

Under this option, costs remain similar to today's apart from a likely drift upwards due to the need to respond to community expectations and waste management standards. Performance against other criteria would remain similar to that of the present.

This option exists only if there are no major impositions on regional waste management by state or national governments, including a carbon price. With the recent releases of the *National Waste Policy* and the *Tasmanian Waste and Resource Management Strategy*, and increasing political pressure on carbon pricing, this is unlikely. The feasibility of the option also presupposes that the communities of southern Tasmania remain satisfied over the longer term with current waste management arrangements and environmental outcomes, which also appears unlikely.

Assessment: Unfavourable. Other options will improve performance and are affordable.

Option WM2: Climbing the Waste Hierarchy

Climbing the waste hierarchy means a vigorous emphasis on waste avoidance, reduction, reuse and recycling. This would require a range of enhancements to regional services and infrastructure, an expanded scope of influence to include the business sector, and a range of supporting activities.

The option envisages collection of domestic recyclables using MGBs in urban and semi-urban areas across all councils. Collections would be expanded, where appropriate, to include plastics 1 to 7, paper, cardboard and liquid paperboard. Some councils may also choose to offer kerbside recycling service to small to medium enterprises (SMEs), especially offices and retail businesses. Organic recycling options would be expanded so that all households in urban areas have at least the option of a garden organics bin. This could be expanded to include food waste when processing infrastructure and capacity is shown to be appropriate or is developed. Transfer stations would be gradually upgraded as needed to operate as resource recovery centres in accordance with best practice, recovering an increasing range of materials (such as e-waste).

Community education programs would be needed to help households and businesses to understand their enhanced obligations to separate waste and to encourage waste reduction. School education programs are also important and would continue in the current guise.

Under this option the region would work in collaboration with DPIPWE and other WMGs in establishing industry programs to promote cleaner production, and enhance separation and recovery of C&I and C&D waste. Urban councils would establish planning requirements for submission of a waste

minimisation and management plan for all large developments, encouraging reuse and segregation of C&D materials.

Costs would clearly increase. Recycling and waste reduction would result in increased diversion from landfill and reductions in greenhouse gas emissions and other environmental costs and risks. There would be an increased reliance on behavioural change. Higher levels of coordination between member councils would be required.

Assessment: Favourable. Effective promotion of waste reduction typically results in high environmental and sustainability outcomes at lower recurrent costs than other options. Recycling also achieves improved environmental outcomes but at higher cost than business as usual.

Option WM3: Enhanced Regionalisation

Many of the waste contracts servicing regional councils are well below the size that is optimal in terms of unit cost, reliability, service standard, contract risk and data provision. Standardisation of services and processes reduces confusion when people move house or visit friends, as well as for holidaymakers.

Under this option, regional or sub-regional contracts would be established for domestic services and for the recovery of recycled materials from transfer stations. In converging contracts, competition would need to be maintained, i.e. monopoly situations avoided. Greater cooperation in contracts would be likely to facilitate better sharing of infrastructure, e.g. resource recovery centres, potentially allowing additional financial savings.

The probability of logistical and contract failures would be reduced but, in counterbalance, the consequences of failure would be greater. Higher levels of performance should result in greater diversion from landfill. Higher levels of coordination would be required between member councils, including allowing SWSA to represent them as a contract principal.

Assessment: Favourable. Regionalisation has potential to reduce total management costs, allow for cost-effective community engagement, and promote greater investment in materials recovery systems and infrastructure.

Option WM4: Landfill Rationalisation

The number of landfills servicing the region is too high to cost-effectively service the region to best practice standards. This option envisages that the five landfills operating in the region would, over time, be rationalised. The remaining sites would receive sufficient income to operate to a high standard including resource recovery, restricted tip face access, leachate collection and treatment, gas collection for energy recovery and appropriate rehabilitation. There may also be potential for pre-sort technologies that recover recyclable materials from deposited waste streams.

It is beyond the scope of this study to make specific recommendations as to how this would be done. Rather, a separate study would be needed to develop a rationalisation plan. The rationalisation would need to be undertaken such that competition was maintained, i.e. monopoly situations avoided.

Landfill rationalisation would be likely to increase costs, at least in the short term as closed sites were rehabilitated and potentially replaced with transfer stations/resource recovery centres. Waste would also need to be transported further and there would potentially be some double-handling. However, unit costs at large landfills are generally considerably cheaper than smaller sites so long as those operate to a good standard. The probability of logistical and contract failures would be reduced but, in counterbalance, the consequences of failure would be greater. Larger sites restrict tip face access and provide resource recovery infrastructure, resulting in greater diversion from landfill. As long as landfill gas is well managed throughout the landfill and waste deposition lifespan, the greenhouse performance of well managed landfills is potentially very good. An increased level of coordination would be needed within the region to implement this option.

Assessment: Favourable. Rationalisation of landfills will allow fewer larger landfills to operate at improved economies of scale and with higher levels of environmental protection and resource recovery.

Option WM5: Residual Waste Processing

The residual waste processing option would involve establishing infrastructure to process residual waste streams as an alternative to landfill. Mechanical and biological treatment (MBT) using aerobic or anaerobic organics processing would probably represent the best regional option. Thermal treatment is likely to be unaffordable and politically difficult to establish. Note that this option is not referring to processing of source-separated organics (see option WM2) or simple separation of recyclables from mixed streams (see option WM4).

Viable MBT technology requires a minimum throughput of around 100,000 tonnes per year and a gate fee upwards of \$150 per tonne. The involvement of all SWSA members and Copping landfill would therefore be required; C&I waste would be unlikely to be attracted to the facility as long as cheaper landfill options are available at Copping landfill, and low-cost recovery opportunities may impact on the total residual waste volumes available only from SWSA sources. This means a high level of coordination between members and the integration into SWSA arrangements of an external organisation. It also means high contract and logistical risks, for example of becoming locked into a technology that does not meet expectations – especially as long-term contracts would be needed. Contingencies would be required in the event of breakdown or bankruptcy.

MBT processing would result in high diversion from landfill as long as markets for processed organics could be found. Greenhouse performance could be very good and environmental impacts and risks can be greatly reduced, especially as the legacy risks of landfills are avoided. There would be some need for behavioural change because the consequences would be worse when inappropriate materials are deposited in the garbage e.g. gas bottles, liquids, chemicals.

Assessment: Unfavourable. Such a facility is unlikely to be cost-effective or commercially viable. Other initiatives such as waste reduction, resource recovery through source separation recycling services and best practice management of landfill including landfill gas recovery are likely to more cost-effectively deliver improved environmental outcomes. Smaller scale mixed waste salvage operations for C&D waste and some C&I waste streams may be viable (as may magnetic extraction of ferrous metals from all waste prior to landfilling) but these are not considered to be WTTs.

The assessment of waste management options is summarised in Table 6.1.

Table 6.1 Summary of Waste Management Options Assessment

Criteria	WM1 Business as usual	WM2 Climbing the waste hierarchy	WM3 Enhanced regionalisation	WM4 Landfill rationalisation	WM5 Residual waste processing
Waste management costs	Similar	Higher ✘	Lower ✔	Higher ✘	Much higher ✘✘
Logistical or contractual risks	Similar	Similar	Similar	Similar	Higher ✘
Diversion from landfill	Similar	Higher ✔	Higher ✔	Higher ✔	Much higher ✔✔
Greenhouse gas emissions	Similar	Lower ✔	Similar	Lower ✔	Lower ✔
Other environmental impacts & risks	Similar	Lower ✔	Lower ✔	Lower ✔	Much lower ✔✔
Reliance on behavioural change	Similar	Higher ✘	Similar	Similar	Higher ✘
Coordination needs	Similar	Higher ✘	Higher ✘	Higher ✘	Much higher ✘✘
Option assessment:	Unfavourable	Favourable	Favourable	Favourable	Unfavourable

Note: Green shades denote favourable outcomes, and pink/red shades denote unfavourable outcomes

6.2 Governance Models

SWSA does not act in isolation and options for governance are dependent on the direction taken by other commonwealth, state and local government stakeholders. A series of models for governance and funding arrangements are discussed and assessed below with consideration of likely actions and reactions of other government bodies.

These options are mutually exclusive and cannot be implemented concurrently. Initial consideration was also given to a model without SWSA, however this was not developed further as it would not contribute to an improved waste management vision and was counter to the expressions of support by stakeholders for a regional waste organisation.

Criteria used for assessing the governance options are:

- the delivery of **strategic focus** and performance against objectives
- the **sustainability** of the outcomes and potential risk for failure
- the impact on **social inclusion and equity** issues, including all sectors of industry and the community
- the **transparency** of the decision-making process and degree of **accountability** to the general public and other levels of government
- the capacity for and ease of **implementation and management**, including the need for regulation
- **economic efficiency** and the level of budgetary and financial management provided.

Option G1: Business as Usual

Under this option there are no major changes in governance or funding to current SWSA arrangements. At the existing level of \$2 per tonne, the voluntary levy would continue to under-supply resources needed for enhanced waste minimisation projects at a regional level. There would be little incentive to

community or business to recycle and waste generation would continue to increase. In the future (with the completion of Glenorchy and Hobart landfills) the majority of southern Tasmania's waste would be deposited at Copping landfill outside of the levy arrangements, diminishing further the resources available to SWSA and undermining the sustainability of regional waste management.

With the current role and responsibilities of SWSA extended into the future, the level of council dissatisfaction would increase and may see some members withdraw. This would negatively impact on the future sustainability of the organisation. The lack of regional leadership may also be viewed unfavourably by the state government, leading to intervention by regulation.

Assessment: Unfavourable.

Option G2: Enhanced Regional Approach

This option would see a regional waste organisation established as an authority with regional responsibility for waste collection, resource recovery and waste disposal. Ownership and/or operation of transfer stations and landfills would be transferred from local councils and the regional organisation would become responsible for delivery of kerbside collection services and facility operations. Copping Refuse Disposal Site Joint Authority would also be incorporated into the new regional organisation.

Under this option, the Office of the Economic Regulator would assist in setting waste management fees that households and industry pay; these fees would fund waste management and infrastructure programs developed by a state/local government resource recovery authority. In effect, the regional waste organisation would operate as a private waste company which owned all waste facilities and delivered all municipal waste services in southern Tasmania. State government oversight would monitor any economic issues arising from the virtual monopoly position of the organisation as owner and operator of all waste facilities in southern Tasmania.

The conflict of interest between waste minimisation and the organisation's reliance on revenue from landfill disposal would have negative impacts on the strategic focus of the organisation. The organisation would have little incentive for innovation in avoiding waste generation, although there is potential for more efficient delivery of existing services and economies of scale achieved through regional contracts. The organisation would have control of all waste in southern Tasmania, facilitating large scale management responses. However while the organisation may have increased access to capital, this would still be insufficient for the scale of infrastructure funding required for development of new waste treatment technologies.

The private waste industry sector is likely to have negative perceptions of the transparency and accountability of this system, and largely disengage from strategic planning in the region: this is particularly so if a facility proponent needs to provide confidential information to obtain the consent of the local planning authority which also competes directly with them for provision of waste services. Without a viable market share of the resources available, large waste companies may close operations; it is possible that the regional organisation would therefore also need to take on management of MRFs and expose itself to attending issues such as sourcing international markets for recovered resources and adopting commodity and exchange rate risks.

A single referral point for community queries on waste would provide greater ease of access, although there would be some estrangement from each community of service delivery of kerbside collections. There may also be some reduction to the accountability for waste services to ratepayers. Regional delivery of community waste education programs is likely to deliver more universal messages, although environmental community groups are likely to perceive some duplicity in waste minimisation and avoidance messages delivered by a landfill operator.

Implementation of this option would be complex, particularly in terms of establishing fair value for public assets and assessing future rehabilitation and monitoring costs for the financial arrangements with councils for transfer of ownership of existing landfills.

Assessment: Unfavourable

Option G3: Local Government Model

This option involves a collective approach by the three WMGs to state government, requesting legislation be passed allowing local government to charge and collect a waste levy on all Tasmanian landfills.

This option would incorporate waste deposited at Copping landfill in application of the levy and would increase funding available to SWSA. It is reliant on an on-going consensus among the three WMGs on the initial levy amount and future increases, as well as spending priorities at both a macro- and micro-level; this is not likely to be sustainable for all cases in the long term and the strategic focus may become splintered between the three WMGs. For their legislative involvement, the state government may see a case for part of the waste levy to be directed to state waste and/or environment projects, including administration and operating costs of the EPA. This approach may also not address state government issues regarding coordination of statewide programs included in the *Tasmanian Waste and Resource Management Strategy*.

The waste and recycling industry is likely to have competitive concerns regarding local government raising and spending the levy as well as operating facilities. There is also potential for the waste industry to play regions against each other in competing for funding for infrastructure. Business, community and other sectors may also voice concerns regarding the transparency and accountability of this model.

Ongoing management would require a high degree of cooperation between councils and may be costly to implement. This would be off-set by the additional funds available to local government through the introduction of a waste levy.

Assessment: Unfavourable

Option G4: State Recovery Authority

This option involves the establishment of a waste/recovery authority by state government, accompanied by regulations introducing a waste levy on landfilled waste. The levy funds are collected by the EPA, and a portion is directed to the waste/recovery authority for funding of waste minimisation initiatives carried out by the three WMGs and member councils. This is the model in place in other Australian states.

This arrangement allows much greater focus on strategic statewide initiatives, and allows for state direction of WMGs on targeted priorities. The legislative and funding approach would provide a low risk of failure of the governance framework, and the regular reporting process required would facilitate a transparent decision-making process. Additional resourcing of the EPA from the waste levy would allow greater enforcement of waste regulations and greater accountability of waste generators for their environmental impacts.

The levy would be imposed on all users disposing of waste to landfill (including users of Copping landfill) and provide financial incentive to recycle across all sectors of the community. The legislative framework also provides the certainty needed by industry to invest in cleaner production initiatives and innovative technologies and waste infrastructure.

Implementation of the recovery authority and supporting legislation would be complex. There would be increased funding available to the three WMGs and local councils, although this would be subject to increased reporting to state government for ongoing operation and funding of special projects. Local government would be involved in discussion on setting the levy amount and future staging of increases, but ultimately the decision would rest with state government.

Assessment: Favourable

Option G5: Hybrid Recovery Authority

This option is a hybrid of Option G4. It involves the establishment of a waste/recovery authority and state regulations implementing a waste levy, however both are carried out with the full involvement of local government.

In this option, local government are engaged in proactive lobbying of the state government to establish a joint recovery authority, and assist in establishing the structure of the recovery authority and the waste levy. There would be local government involvement in the ongoing operation of the recovery authority. This option capitalises on the window of opportunity available before alternate arrangements are put in place by state government to oversee implementation of the *Tasmanian Waste and Resource Management Strategy*.

It maintains the sustainability, transparency, accountability and economic context of Option G4, but allows greater focus on issues of concern to local government.

Assessment: Favourable. Preferred – provides optimum outcomes for local government.

The assessment of governance options is summarised in Table 6.2

Table 6.2 Summary of Governance Options Assessment

Criteria	G1 Business as usual	G2 Enhanced regional approach	G3 Local govt	G4 State recovery authority	G5 Hybrid recovery authority
Strategic focus	Lower ✘	Lower ✘	Lower ✘	Much higher ✓✓	Much higher ✓✓
Sustainability	Lower ✘	Higher ✓	Lower ✘	Much higher ✓✓	Much higher ✓✓
Social inclusion and equity	Similar	Similar	Similar	Higher ✓	Higher ✓
Transparency & accountability	Similar	Lower ✘	Lower ✘	Higher ✓	Higher ✓
Implementation & management	Similar	Much higher ✘✘	Much higher ✘✘	Much higher ✘✘	Much higher ✘✘
Economic efficiency	Similar	Higher ✓	Similar	Higher ✓	Higher ✓
Option assessment:	Unfavourable	Unfavourable	Unfavourable	Favourable	Favourable

Note: Green shades denote favourable outcomes, and pink/red shades denote unfavourable outcomes

6.3 Assessment Summary

The assessment of both waste management and governance options shows that the following options warrant favourable consideration in development of future waste management strategies in southern Tasmania:

Waste management options:

- WM2 Climbing the waste hierarchy
- WM3 Enhanced regionalisation of services
- WM4 Enhanced regionalisation of infrastructure.

Governance options:

- G4 State recovery authority
- G5 Hybrid recovery authority.

As mentioned earlier, SWSA’s waste strategy should integrate a range of education, minimisation, recovery and infrastructure actions. More detailed cost-benefit analysis of the three potential waste management options should be undertaken to further differentiate between the elements of these approaches and determine the optimal strategy.

The final governance option will be subject to the success of negotiations between SWSA, state government, the two other WMGs, LGAT and other key stakeholders. The optimal outcome for local

government would be the G5 option for a hybrid recovery authority, which maximises ongoing local government participation in the policy and regulatory framework in which it operates.

7. DEVELOPING A VISION FOR 2020 AND BEYOND

Principles

In developing a vision for waste management in southern Tasmania, five underlying principles were adopted:

- management of waste in accordance with the waste management hierarchy
- stewardship of the environment to reduce adverse impacts on future generations
- a precautionary approach to environmental, health and safety risk
- life-cycle assessment to incorporate all aspects of waste from material generation to disposal
- polluters and users pay for impacts they cause and services they use.

Current Status

Features of existing waste management in southern Tasmania in 2009/10 include:

- around 85-89% coverage of householders with kerbside collection services for garbage and recyclables
- around 340,000 tonnes of waste generated, of which around 124,000 tonnes was recovered for reuse and recycling and nearly 216,000 tonnes deposited to landfill
- approximately 35% of waste was generated by householders, with the remaining 65% generated by the commercial & industrial and construction & demolition sectors
- a total waste generation rate for all sectors of around 1,400 kg per person per year (including 500 kg per person per year for municipal waste only)
- five landfills serve the region, some with limited remaining airspace (for design capacity and environmental risk reasons)
- Copping landfill users do not contribute to funding for regional waste management
- burden of regional waste management costs met largely by local government; additional risks of C&I waste not met by industry sector
- SWSA funding of \$328,442 provided in 2010/11 and used mainly for administration costs
- waste generation is trending upwards, indicating a lack of success in waste minimisation and resource recovery initiatives to date
- increasing responsibilities of SWSA and member councils in responding to the *National Waste Policy* and the *Tasmanian Waste and Resource Management Strategy*
- concerns over the ability of the current SWSA governance and funding structure to deliver optimum regional waste minimisation and management outcomes.

The ongoing trajectory of these features will see waste generation continue to increase, SWSA funding decrease (with increased disposal of waste to Copping landfill as other landfills close or are undercut on price) and difficulty in meeting regional responsibilities embedded in national and state waste strategies. SWSA's current structure and funding place limitations on achieving waste minimisation and resource recovery objectives inherent in the waste management hierarchy, and fundamental changes are needed to progress this.

Strategic Directions

Waste management and resource recovery faces a number of geographic, economic, demographic, market and political challenges in southern Tasmania, nevertheless industry practice and trends

implemented elsewhere show there are opportunities for improvement. Assessment of the applicability of key industry trends to southern Tasmania, combined with local research and stakeholder consultation, determined the following strategic directions be adopted:

- **Regional waste management:** A regional waste management group is the preferred management system in southern Tasmania, however there are changes needed to the management structure of SWSA for it to fit the role member councils wish it to play in the future.
- **Waste levy:** Rather than the current voluntary levy, SWSA funding would be more sustainable and equitable with the introduction of a state government waste levy paid by landfill users. It would provide better targeting of users of all landfills in southern Tasmania (including Copping landfill), provide financial incentive to recover and recycle materials, and facilitate development of better infrastructure and innovative local waste solutions.
- **Resource recovery authority:** Establishment of a joint state/local government initiated resource recovery authority offers the optimum structure to deliver on statewide strategies, undertake research and development, and fund infrastructure and recovery programs. Early engagement by local government with state government to develop this structure will provide long term focus on issues of concern to local government.
- **Waste minimisation:** Waste minimisation has the potential in the long term to make a significant impact on the amount of waste generated, particularly cleaner production by industry. However interstate experience shows that long term consistent communication and education is required before any achievement can be measured. SWSA and member councils can provide leadership to the community through a range of waste minimisation activities which influence behaviour and consumption patterns.
- **Collection systems:** Kerbside collection services for garbage are well established, but improvements could be made to recycling services to extend the service to all councils in southern Tasmania, improve recovery rates through the use of MGBs instead of crates, and make the type of materials collected uniform by expanding the range of materials collected in some council areas. The recycling collection service could be offered to SMEs in urban areas. There is also potential for a MGB-based collection service of garden organics on a voluntary or user pays basis in urban areas; this may be expanded to include food organics in the future. Reduced contamination and increased diversion may be achieved through continuing community education programs.
- **Waste data:** There are gaps in recorded data in southern Tasmania, both on the amount and source of generation of waste and on the amount and type of materials recovered. Council contracts should address regular provision of this information by contractors; information could then be provided by councils to SWSA for recording in a regional database. While weighbridges will give the most accurate data by weight, a regime of regular volumetric surveys of landfills will improve on current data at small landfills where installation of weighbridges is not economically feasible at present. Additional data on the composition of domestic garbage could be gathered by a series of regional waste and recycling audits.

- **Industry:** There is a lack of communication between local government and the C&I sector on waste and recycling issues. Potential opportunities for waste minimisation and resource recovery should be explored through an ongoing collaborative approach.
- **Greenhouse emissions:** Methane from landfills contributes to greenhouse gas emissions and may be included in the Commonwealth Government's proposed carbon pricing scheme. Carbon costs and other greenhouse policies will exert pressure on waste arrangements to separate inert waste from putrescible waste, process organic waste and consolidate landfills to a scale at which collection and oxidisation of methane is viable.
- **Waste treatment & processing:** Large scale 'high tech' waste treatment technologies are not considered feasible in southern Tasmania, however there may be viable opportunities for composting of food and garden organics. This may involve using existing composting facilities, establishing a regional facility or a number of smaller sub-regional facilities.
- **Infrastructure:** There will be continuing need for landfill disposal at some level in southern Tasmania and facilities should be available to meet this future need without oversupplying airspace. There is potential for rationalisation of some landfills in the region, although this would be subject to further detailed investigation of site, airspace, transport and cost issues. There is potential for optimising use of transfer stations through increased recovery, increased waste compaction and operation of RRCs in accordance with best practice guides.

Vision

The vision for SWSA is to help deliver a sustainable community in southern Tasmania through strategies which minimise waste and optimise resource recovery. By 2020 the goal is for southern Tasmania to be more efficient in materials use, have reduced waste generation, and to reuse, recover and/or recycle the majority of the waste it produces. The strategic directions outlined above provide for the achievement of this goal.

Recommendations

Recommendations for SWSA waste management and governance are provided in the following tables, including a suggested timeline for implementation. Note the different timetables for implementation in Tables 7.1 and 7.2.

Table 7.1 Recommendations – Governance

Action	Implementation timetable		
	0-3 months	3-6 months	6-12 months
Initiate discussions with state government, other WMGs and LGAT relating to the potential establishment of a joint recovery authority funded by a statewide waste levy			
Develop a charter of corporate governance which expands the functions and responsibilities of SWSA			
Amend reporting and management systems to reflect expanded responsibilities of SWSA			
Consider opportunities for introducing skills-based board members and industry representatives to SWSA board			
Develop a new strategic plan once revised funding and management arrangements are determined			

Table 7.2 Recommendations – Waste Management

Action	Implementation timetable		
	1-3 yrs	3-10 yrs	> 10 yrs
Influencing Behaviour			
Advocate and encourage less wasteful consumption patterns in partnership with WMGs and state government			
Provide continual direction to the community on materials that can be recycled			
Provide feedback to the community on the end-products of materials recovered			
Establish a community education program addressing the need for increased waste management costs			
Consider development of a green purchasing policy for implementation by councils			
Consider implementation of a requirement for planning applications for large developments to include a waste minimisation & management plan			
Consider options for councils to implement minimisation incentives in waste charging mechanisms			
Establish a program of regular meetings with staff and board members of Northern Tasmania WMG and Cradle Coast WMG			
Establish a system for regular consultation with industry stakeholders and maintain on-going liaison			
Consider establishment of an industry waste network			
Maintain waste/recovery industry knowledge and share information with member councils			
Management Systems			
Conduct regular waste & recyclables audits across the region			
Ensure waste management contractors provide regular reports to councils on the volume & type of recyclables collected from kerbside services			
Establish a regional database on the amount of waste landfilled,			

Action	Implementation timetable		
	1-3 yrs	3-10 yrs	> 10 yrs
recyclables collected & materials diverted at council facilities			
Establish a regional database on member councils' cost structures for provision of waste services and operation of facilities			
Consider aligning contract expiry dates to allow future consideration of regional or sub-regional contracts for kerbside collection services			
Resource Recovery			
Expand kerbside recyclables services to incorporate MGBs at all councils (including Huon Valley)			
Expand materials collected to include plastics 1-7 and paper, cardboard and liquid paperboard at all councils			
Consider provision of MGB-based garden organics collection service in urban areas			
Consider expansion of garden organics collection to include food organics			
Consider extending domestic recyclables service to SMEs			
Consider options for recovering additional materials at RRCs			
Continue support of resale centres			
Maintain industry knowledge of resource recovery trends and opportunities and share information with member councils			
Develop a policy position on national waste issues (such as proposed product stewardship schemes, greenhouse emissions, hazardous waste management) to allow active engagement in discussions			
Explore opportunities & assess feasibility of recovery and processing of C&D waste			
Identify major C&I waste streams and consider developing response strategies in association with relevant industry associations			
Infrastructure			
Assess landfills and resource recovery centres against best practice to benchmark current practices and identify opportunities for improvement			
Consider options to reduce greenhouse emissions from landfills			
Maintain knowledge of industry trends in WTTs			
Assess potential to direct additional organics to compost facilities at Hobart, Oatlands & Kingborough			
Consider options for development of regional and/or sub-regional organics processing facilities			
Undertake regional landfill investigation to assess airspace requirements & availability, transport & greenhouse costs, & potential rationalisation			

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Appendix A
Stakeholder Consultation

STAKEHOLDER CONSULTATION

A range of stakeholders were consulted during preparation of this report, both by face-to-face meetings, telephone conversations and email communications. The list of stakeholders consulted is as follows (in alphabetical order).

Brighton Council
Central Highlands Council
Clarence City Council
Copping Refuse Disposal Site Joint Authority
Cradle Coast Waste Management Group
Department of Primary Industries Parks Water and Environment, Environment Protection Authority
Division
Derwent Valley Council
Dulverton Waste Management
Eenee Compostables
Glamorgan Spring Bay Council
Glenorchy City Council
Hobart City Council
Huron Valley Council
Kingborough Council
Local Government Association of Tasmania
Mike Ritchie & Associates
Mornington Park Transfer Station Pty Ltd
Northern Tasmanian Waste Management Group
Nyrstar
Recovery Tasmania Pty Ltd
Sorell Council
Southern Midlands Council
Southern Tasmanian Councils Authority
Southern Waste Strategy Authority
Tasman Council
Veolia Environmental Services (Australia) Pty Ltd
Waste Advisory Committee – Louise Cherrie (industry representative), Nigel Shearer (community representative)