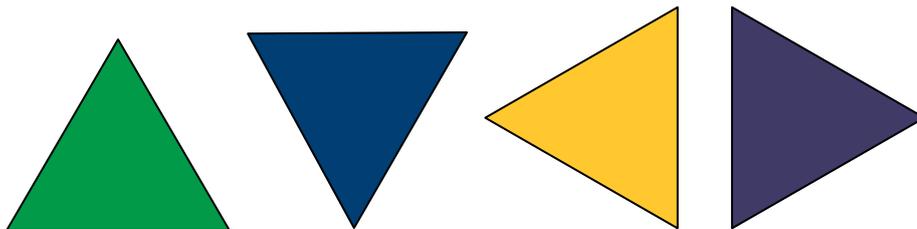


REGIONAL WASTE AVOIDANCE AND RESOURCE RECOVERY STRATEGY

22 MAY 2014



Prepared by:

Wright Corporate Strategy for the Southern Councils Group

EXECUTIVE SUMMARY

The Southern Councils Group (SCG) is a voluntary peak organisation of Councils in the Illawarra and South Coast Regions of NSW. The SCG works collaboratively for better regional outcomes in waste management and various other service areas. SCG leads several regional programs to improve waste management and resource recovery activities in the region.

SCG has developed this *Regional Waste Avoidance and Recovery Strategy*. This work with funding through the NSW EPA under an agreement between SCG and the EPA for a *Regional Coordination Support Package* on behalf of the Wollongong, Shellharbour, Kiama, Shoalhaven, and Wingecarribee Councils.

The *Regional Waste Avoidance and Recovery Strategy* is based on the idea of extending regional collaboration to address whole-of-region waste management and resource recovery issues— particularly where there is potential for co-funding grants available through the NSW *Waste Less, Recycle More* initiative. The Strategy recognises that each SCG member Council is independently implementing its own waste management and resource recovery strategy.

The draft *Regional Waste Avoidance and Recovery Strategy* sets out a framework for SCG member Councils to consider opportunities to:

- collaborate to support community-wide action in managing cross-regional issues such as litter, illegal dumping and safe stewardship of problem wastes;
- collaborate to use their collective buying power where feasible to secure the most cost-effective waste management and resource recovery contract terms;
- collaborate to establish and operate waste infrastructure and facilities, where it is cost-effective and feasible to do so, in delivering regional waste services.

The main strategic themes set out below are aligned to the *NSW Waste Avoidance and Resource Recovery Strategy 2013-21* (WARR Strategy) which was recently published by the NSW EPA.

Theme 1. Avoid and reduce waste generation

The progressive increase in waste generated over many years is generally regarded as a function of three main influences: population increase, product quality, and economic conditions. The growth rate of waste generation has generally been higher than average population growth. This Theme seeks to build on broad state-wide initiatives to reduce the rate of waste generation, including reducing food waste, promoting home composting, and supporting local reuse of discarded products to reduce entry to the

waste stream of reusable materials.

Theme 2. Increase recycling

The draft WARR Strategy sets a target of 70% for municipal recycling; a 19 percentage point increase on the current average regional recycling level. With garden waste recovery and processing already in place, the next logical step in the recycling agenda is to focus on the red residual waste bin. These garbage bins contain a high proportion of food waste, and a substantial proportion of recyclable materials which could have been discarded to the kerbside recycling bin.

This Theme describes regional initiatives to complement established Local Council strategies.

Theme 3. Increase community reuse and recycling and improve household problem waste collection

Community drop-off centres in convenient locations can be used to collect: problem wastes, including low level household toxic wastes including paint, batteries, smoke alarms etc; recyclable materials such as e-waste, paper/cardboard, beverage containers, and metals; and some products suitable for reuse.

Most regional Councils across NSW already operate facilities equipped to receive these sorts of wastes. The EPA has further developed the community drop-off centre concept and proposes uniform branding and accessibility to generate patronage. Grant funding is available through the Local Government Waste and Resource Recovery Program.

Some SCG member Councils have already submitted grant applications and scope exists for sub-regional collaboration to extend the network of drop-off centres. The program could be supported with a regional education and engagement activity.

Theme 4. Reduce littering and increase public place recycling

SCG and member Councils have prepared complimentary applications to draw on funding support to establish integrated litter reduction programs. The regional component focuses on community education and enforcement activity. Council applications include litter counts, bin infrastructure, and clean-up activity.

An enlarged network of attractive public place waste and recycling bins throughout the region could contribute to both reduced litter and improved public place recycling opportunities to further develop a recycling culture across the region.

Theme 5. Reduce illegal dumping

A *Regional Illegal Dumping Prevention Strategy* has been prepared and a Regional Illegal Dumping Coordinator has been appointed to assist with the implementation of the strategy. A series of television advertisements has been aired across the region to raise community awareness of the problem, penalties for illegal dumping, and options for lawful disposal.

SCG and member Councils propose to extend the current Illegal Dumping Program and have requested funding under the NSW Government *Waste Less, Recycle More* Initiative – Combating Illegal Dumping.

Theme 6. Increase regional collaboration

With a Regional Coordinator recently appointed, the SCG secretariat is now able to coordinate nominated waste programs and provide a single point for development of region-wide project funding applications. With further strengthening of capacity, the SCG secretariat could increase the strategic capability of the region and play a wider, more effective role in coordinating regional action for improved waste management and resource recovery.

The Regional Strategy includes Action Plans to deliver each of the above themes.

TABLE OF CONTENTS

	page
<hr/>	
<u>Executive Summary</u>	
<hr/>	
1 <u>Introduction</u>	1
<hr/>	
2 <u>Current SCG Member Council Situation</u>	3
<u>The Region</u>	3
<u>Waste and Resource Recovery Data</u>	6
<u>Waste Composition and Audit Data</u>	11
<u>Current Waste and Resource Recovery Services and Contracts</u>	15
<u>Waste Management and Resource Recovery Infrastructure</u>	15
<u>SCG Member Council Strategic Themes</u>	16
<hr/>	
3 <u>Review of SCG Group Situation</u>	17
<u>Strategic Purpose and Waste Programs</u>	17
<u>Strategic Issues and Challenges</u>	17
<u>Public Policy and Strategy Drivers and Trends</u>	24
<u>Market and Technology Performance and Trends</u>	28
<hr/>	
4 <u>Regional Ambitions and Strategic Direction</u>	37
<u>Principles for Regional Collaboration</u>	37
<u>Themes Adopted in Waste Strategy Framework</u>	38
<hr/>	
5 <u>Regional Strategy</u>	42
<u>Opportunities Evaluated</u>	42
<u>Evaluation Procedure and Results</u>	42
<hr/>	
6 <u>Action Plans</u>	77
<u>Theme 1. Avoid and reduce waste generation</u>	78
<u>Theme 2. Increased recycling</u>	80
<u>Theme 3. Increase community reuse and recycling and improve problem waste capture</u>	81
<u>Theme 4. Reduce littering and increase public place recycling</u>	82
<u>Theme 5. Reduce illegal dumping</u>	83
<u>Theme 6. Increase regional collaboration</u>	84

APPENDIX A. Detailed Analysis of Current Situation

85

APPENDIX B. SCG Council Service Arrangements and Strategies

92

1. INTRODUCTION

The Southern Councils Group (SCG) is a voluntary peak organisation of Councils in the Illawarra and South Coast Regions of NSW. The group works collaboratively for better regional outcomes in waste management and various other service areas. SCG leads numerous programs to improve waste management and resource recovery activities in the region.

SCG completed work in 2010 to assess options for waste processing and determine the relative merit of a regional approach in comparison with establishing processing operations at the individual Council level. This study demonstrated the merit of AWT waste processing over continued direct disposal, but found the options of regional, sub-regional and individual Council arrangements were broadly on par, and Council circumstances and readiness varied markedly indicating a preference for Council-specific action. Individual Councils within the region have, since 2010, progressed their strategic planning for waste processing at varying pace.

Significant issues and advances in waste management over recent years, and the potential for NSW Government funding assistance, have made it appropriate to move to the next stage in exploring collaborative opportunities for improved efficiency and better outcomes in waste management.

Accordingly, SCG has resolved to develop a *Regional Waste Avoidance and Recovery Strategy*. SCG has entered into a funding agreement with the NSW EPA for a Regional Coordination Support Package on behalf of the Wollongong, Shellharbour, Kiama, Shoalhaven and Wingecarribee member Councils. The package allows SCG to develop the Regional Waste Strategy, identify regional waste management and recycling needs and maximise funding opportunities under the *Waste Less, Recycle More* initiative.

The keys aspects addressed in preparing this *Regional Waste Avoidance and Recovery Strategy* are:

- The currency of waste strategies and business plans previously prepared or operating at individual Council level, and the scope for "...working together, separately" recognising the over-riding position of each Council with its own waste strategy.
- Opportunities for regional collaboration to address waste infrastructure needs and other waste management and resource recovery issues – particularly with potential for co-funding through the *Waste Less, Recycle More* initiative.

The Regional Waste Strategy is based on efficient management arrangements across the region, and development of substantive, potentially region-wide options for better outcomes – reduced costs, improved resource recovery, increased flexibility, and better

service provision. The strategy addresses proposals for infrastructure and systems to bring about scale efficiencies.

Looking beyond the region, SCG will collaborate with other similar organisations with a view to lobbying Governments to introduce new product stewardship arrangements and further regulate the packaging industry, producers and importers to ensure industry increases recycling and / or reduce levels of unnecessary packaging and contributes to the cost of waste management.

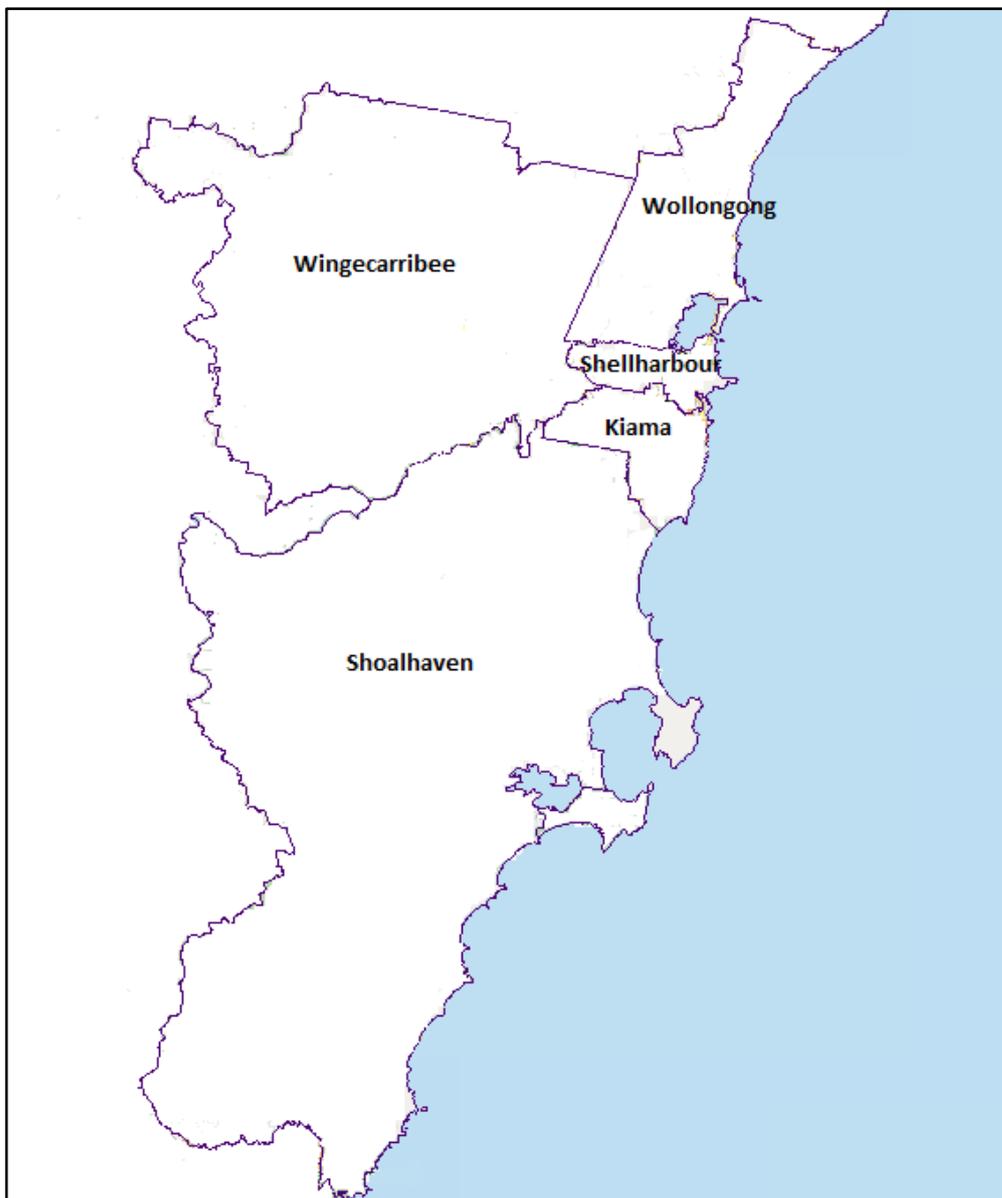
2. CURRENT SCG SITUATION

The Region

The Southern Councils Group (SCG) represents a voluntary grouping of five Councils in the Illawarra and South Coast Regions of NSW (Figure 2-1). The group includes:

- Wollongong City Council
- Kiama Municipal Council
- Shellharbour City Council
- Shoalhaven City Council
- Wingecarribee Shire Council.

Figure 2-1: Southern Councils Group LGAs



The geographic boundary of the five councils extends across the Illawarra and South Coast of NSW with a land area of more than 18,000 square kilometres. The population of the

region is around 430,000 residing in some 200,000 dwellings. Southern Councils group comprises 6.25% of the population of NSW (2011 Census). The residential population of half a million can double, and up to treble in coastal locations during the holiday periods from the October long weekend to Easter.

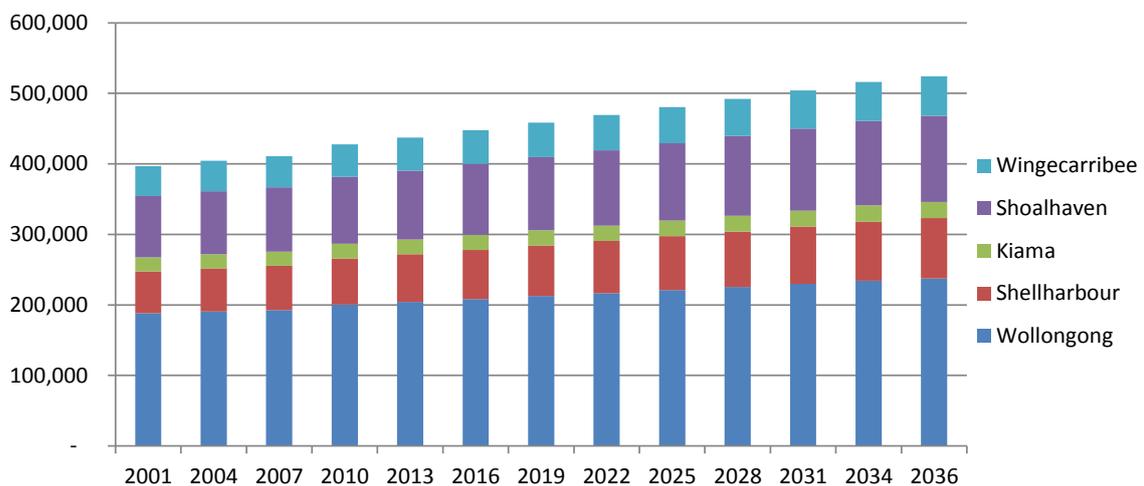
The northern part of the region has a large multicultural influence. An ageing retirement population resides in the south and west, and a small but strong indigenous presence in all areas. With an increasingly diverse manufacturing base, active sea ports, and a vibrant tertiary education sector, the region makes a significant contribution to the Australian economy.

The region has a strong industrial heritage in steel, related manufacturing and underground coal mining industries. In the face of challenges including the early 1980s recession, the global financial crisis, overseas competition and a high Australian dollar, the economic base of the region continues to diversify with reduced reliance on these traditional sectors for employment and output.

Population and Demographic Profile

Population forecasts to 2036, using past growth trends from 2001, 2006 and 2011 ABS census data are shown at Figure 2-2. The region's population in 2036 is expected to be around 524,000. For a breakdown of the population projections for each LGA refer to Appendix A.

Figure 2-2: Population forecast for SCG Region (source: ABS)

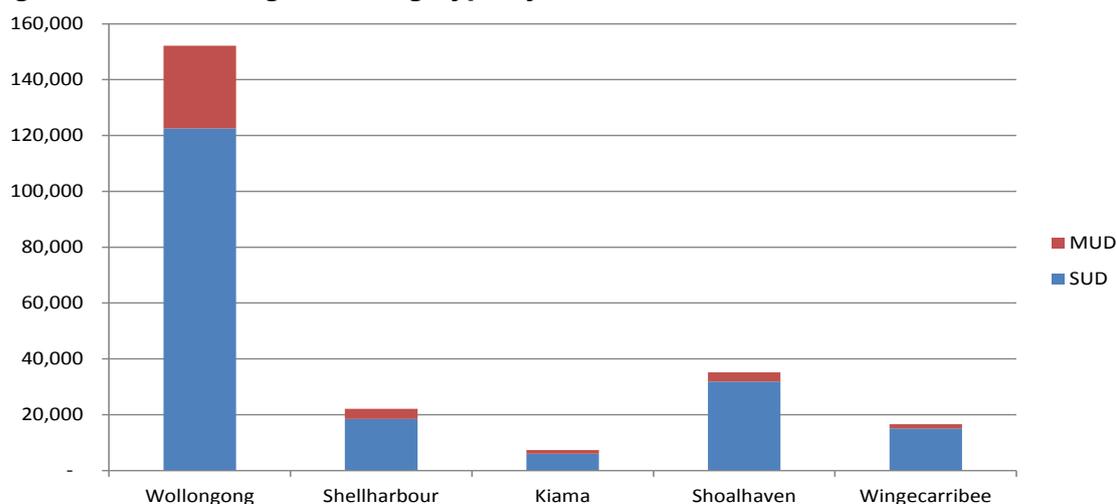


Dwelling Composition

Various studies and waste audits have demonstrated higher rates of waste generation are significantly positively correlated with a high proportion of separate houses. That is, more waste is produced from SUDs than MUDs. This is partially due to there being fewer people living in each MUD than in each single dwelling (in 2011 there were an average of 2.7 people living in each SUD and 1.7 people living in each MUD), and partially due to less green waste generated in MUDs¹.

The EPA has defined SUDs using the ABS definition *separate house* and MUDs to include *semi-detached, row or terrace house, townhouse, flat, unit or apartment*. In the 2011 audit, SUDs comprised approximately 80% of the total dwellings in the region, and MUDs 20%. There has been significant growth in the number of MUDs in SGC councils between 2001 and 2011, particularly Kiama, which has experienced an annual growth in MUDs of 3.31%. With increasing construction of MUDs across the region, the amount of waste generated per dwelling is expected to decrease. For an LGA breakdown of the percentage change in dwelling types between 2001 and 2011 see Appendix A.

Figure 2-3: Percentage Dwelling Type by LGA (ABS 2011)



Age Distribution Analysis

An ageing trend is observed in the entire region and particularly in Kiama according to analysis of census data between 2001 and 2011 (See Appendix A, Figure A-1). The number of 5-14 year olds living in Kiama has halved (14% down to 6%), while the number of 55-64 year olds more than doubled (9% up to 23%) in that period. The number of individuals in the 65+ age bracket has increased by 30%. Expansion of retirement villages and hospitals

¹ Zero Waste SA and Integrated Design Commission. *Report for State Waste Management Guidance for Medium Density, High Density and Multi-Unit Developments in Metropolitan Adelaide.*
<http://www.zerowaste.sa.gov.au/upload/resource-centre/publications/local-government/5642/MUDs%20consultation%20report.pdf>

in the region could further increase the aging demographic. For more detailed information on the ageing demographic in the region, please refer to Appendix A.

Although there is some variability with the findings correlating age with recycling, there have been several studies that show a positive relationship between increased age and increased recycling. For example a large study performed by the Department for Environment, Food and Rural Affairs in the UK revealed that the older respondents were more likely to participate in recycling, with the most enthusiastic recyclers being aged 65 and over. This age group was also the most likely to make compost out of kitchen waste.

Proficiency in English

The majority of the population in the SCG are proficient in English which can allow greater ease of communication with residents and reduced costs associated with translation of education materials. The percentage of residents regionally that do not speak English is 6.2%, which is much lower than the NSW average of 14.6%. For a breakdown by LGA please Appendix A.

Waste and Resource Recovery Data

Collection Systems

In 2011/12 SCG Councils provided more than 184,000 kerbside waste services and recycling services and nearly 120,000 kerbside garden organics waste services – a total of nearly 500,000 services (see Table 2-1 below). In 2011/12 there were no combined food and garden organics kerbside services.

Table 2-1: Number of Services (Council-provided)

Council	Waste services	Recycling services	Garden waste services	Number of clean up services
Wollongong	86,643	86,643	86,643	Two pre-booked/year
Shellharbour	23,836	23,836	23,836	Unlimited pre-paid pre-booked/year
Kiama	8,789	8,789	8,383	Two scheduled/year (urban area only)
Shoalhaven	47,154	47,154	0	Unlimited pre-paid pre-booked/year
Wingecarribee	18,077	18,077	0	Two pre-paid pre-booked/year
Total	184,499	184,499	118,862	

The bin configurations and frequencies are outlined below (2012/13). Most of the SCG member Councils provide a choice between different sized residual waste bin sizes and collection frequencies consistent with EPA best practice (with the exception of Shoalhaven and Wingecarribee who do not currently provide containerised collection of garden waste).

Where there are bin size options available to residents the percentages of each of the sizes taken up are noted. Recycling bin configurations in all councils are consistent with current best practice guidelines. Bin lids for all waste streams are also consistent with best practice.

Table 2-2: Bin configurations and collection frequencies (Council-provided)

Council	Residual Waste		Recycling		Garden Organics	
	Bin Size	Frequency	Bin Size	Frequency	Bin Size	Frequency
Wollongong	80L (25%)	Weekly	240L	Fortnightly	240L	Fortnightly
	120L (68%)					
	240L (6%)					
Kiama	80L (10%)	Weekly	240L	Fortnightly	240L	Fortnightly
	140L (85%)					
	240L (5%)					
Shellharbour	140L (7%) 240L (93%)	Fortnightly	240L	Fortnightly	240L	Fortnightly
Shoalhaven	80L (5%)	Weekly	240L	Fortnightly	N/A	N/A
	120L (80%)					
	240L (15%)					
Wingecarribee	½80L (14%)*	Weekly	240L	Fortnightly	N/A	N/A
	80L (83%)**					
	2x80L (3%)					

* One collection per fortnight

**Wingecarribee Council is procuring a service due to start in July that will offer 80L, 140L, and 240L bins.

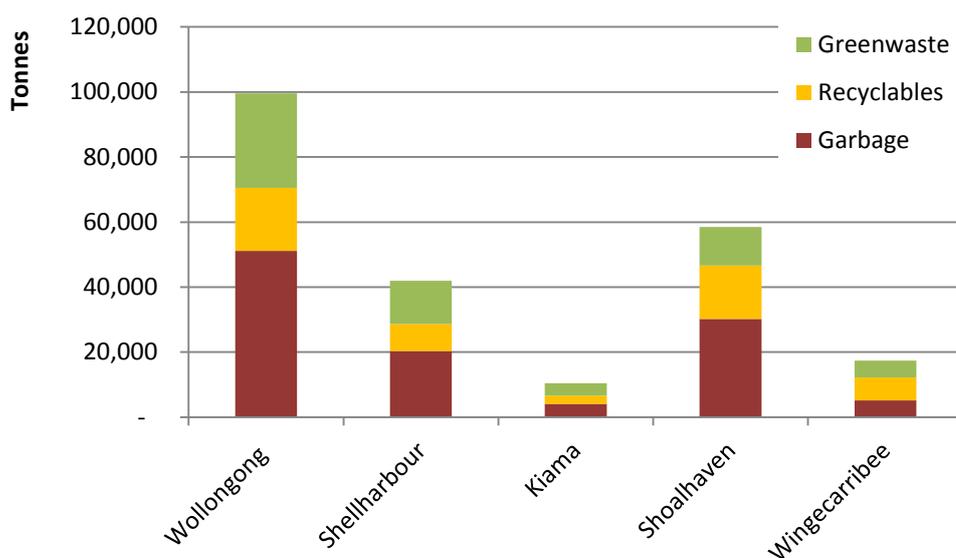
Wollongong and Shellharbour have recently jointly procured new collection services that involve separate but similar contracts. Collections are due to commence on 1 July 2014.

Domestic Tonnage Data

SCG councils together generate more than 225,000 tonnes of domestic waste per year.

Wollongong generates the majority of 44% of the total SCG waste, followed by Shoalhaven 26% and Shellharbour 18%.

Figure 2-4: Total Domestic - Waste and Resource Recovery (2011/12 EPA)



The amount of waste recycled, disposed and generated is set out in Table 2-3, which shows Wingecarribee with the highest recycling rate resulting from residual waste processing by SITA.

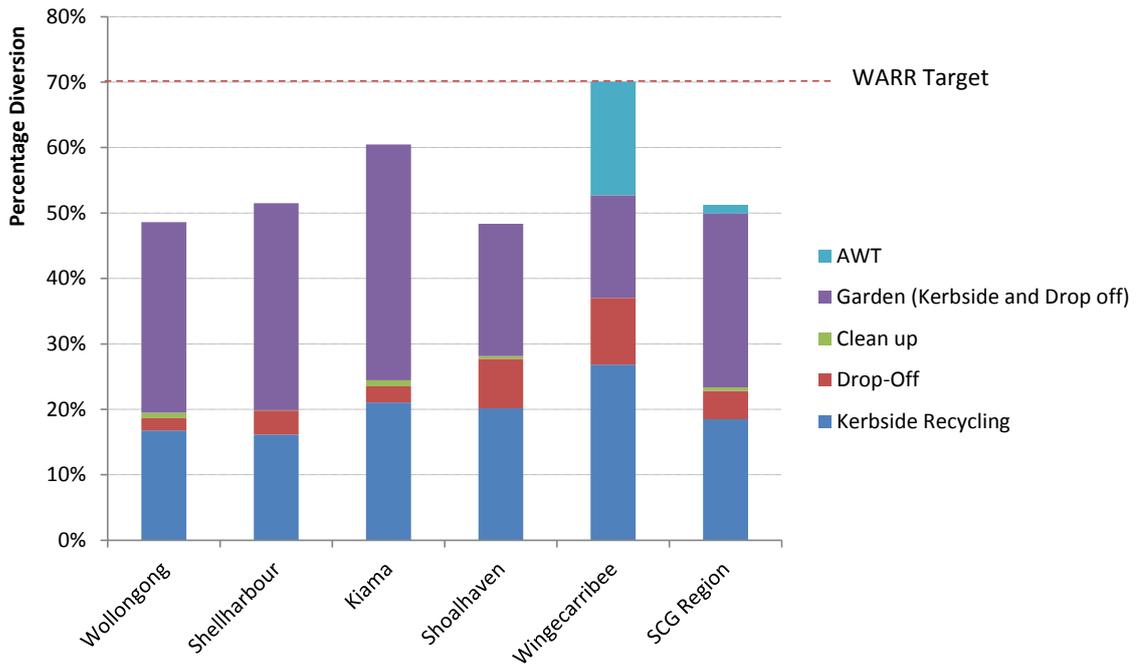
Table 2-3: Total Domestic - Waste and Resource Recovery Generation (2011/12 EPA)

Council Name	RECYCLED		DISPOSED		Total Domestic Waste Generated
	Domestic Kerbside, Clean Up, Drop off, AWT Recyclables		Domestic Kerbside, Clean Up, Drop off		
	Tonnes	%	Tonnes	%	Tonnes
Wollongong	48,404	49%	51,154	51%	99,558
Shellharbour	21,612	52%	20,347	48%	41,959
Kiama	6,296	60%	4,117	40%	10,413
Shoalhaven	28,301	48%	30,208	52%	58,509
Wingecarribee	12,153	70%	5,186	30%	17,339
SCG Region	116,766	51%	111,013	49%	227,779

Recycling Sources

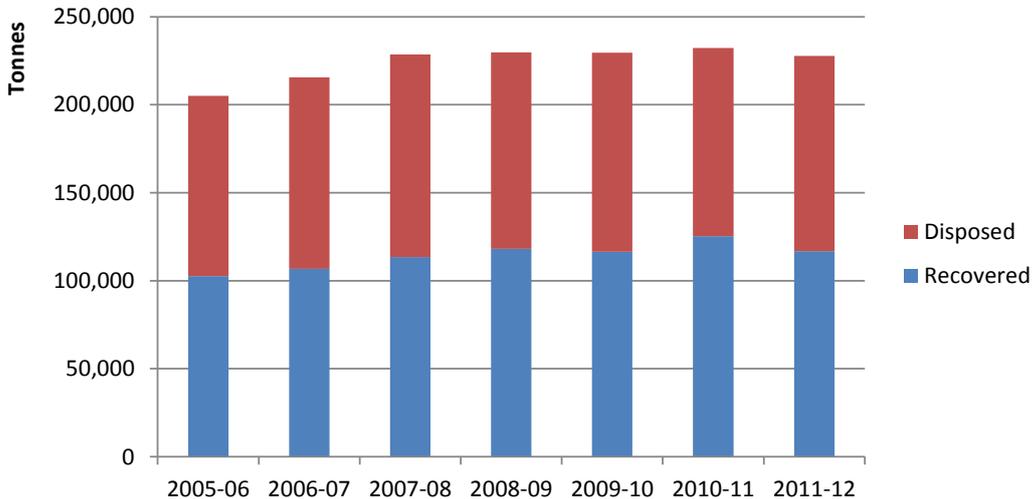
The following graph represents the progress of each council towards reaching the WARR target. Wingecarribee has already met the target. The contribution of each of the recycling streams is represented within each bar. Kiama has a relatively high recycling rate without inclusion of AWT treatment of mixed waste. If each of the councils processed the contents of their residual waste bin in an AWT facility it is expected they would also meet the 70% target. A regional breakdown of recycling is set out at Appendix A.

Figure 2-5: Progress toward WARR targets (2011/12 EPA)



A temporal representation of the change in domestic waste generation each year between 2005/06 and 2011/12 for the aggregate SCG LGAs is at Figure 2-6. Waste generated between 2005 and 2012 increased by 11% in line with the rate of population growth over the same period. Recycling for the same period increased by 14%, demonstrating a slight improvement in performance beyond the increase attributable to population growth.

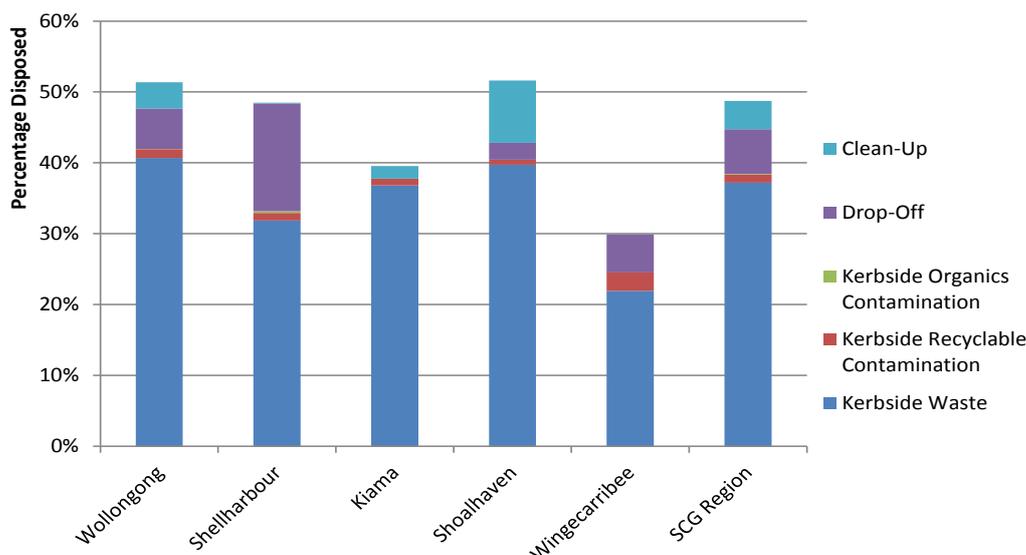
Figure 2-6: SGC Domestic Waste Generated, Recovered and Disposed 2005–06 to 2011–12 (Source: Local Government Waste and Resource Recovery Data Reports)



Disposal Sources

The following graph at Figure 2-7 contains a breakdown of the waste to landfill from the various domestic sources.

Figure 2-7: Percentage Disposed – All Domestic Sources (EPA 2011/12)



Drop Off and Kerbside Clean Up

There is significant variability in the data as a result of the various services provided by councils. Each council provides a different service type, for example Kiama have an e-waste day and have a high resource recovery rate due to the nature of the e-waste stream, whereas Shoalhaven provide residents with drop off tipping vouchers in lieu of kerbside clean up and report these figures against clean up. Some councils collect organics in the clean up and others do not. The difference between the services results in difficulty with meaningful comparisons.

The variation between Councils in the amount of clean up and drop off material is significant when viewed on a per capita basis. Residents in Shellharbour and Shoalhaven generate more than double the amount of residents from the other three LGAs.

Table 2-4: Summary of Waste Drop Off and Clean Up – tonnes (EPA 2011/12)

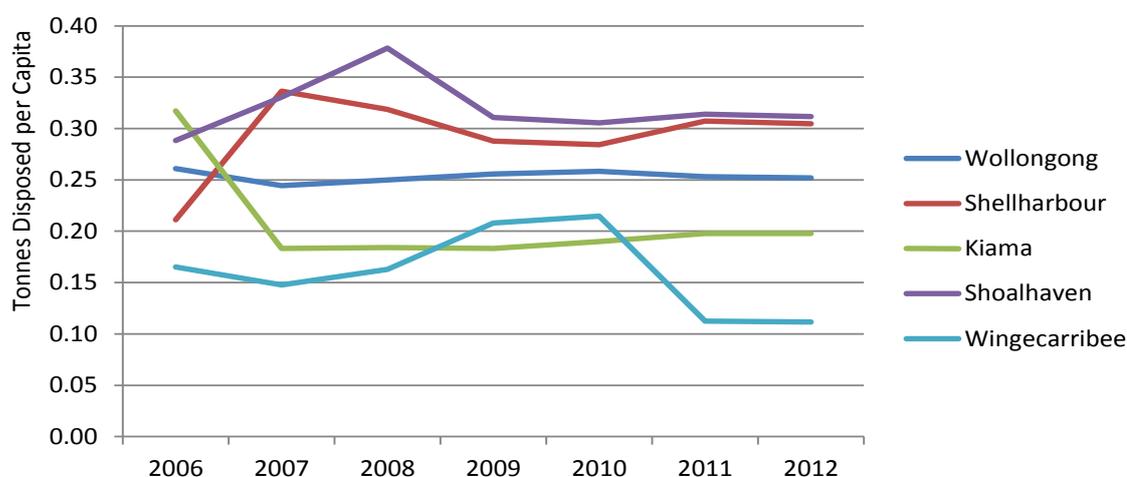
	Recycled	Landfilled	Generated	Population	Generated per capita
Wollongong	6,615	9,359	15,974	169,205	0.09
Shellharbour	6,347	6,420	12,767	57,899	0.22
Kiama	1,228	183	1,412	18,410	0.08
Shoalhaven	11,627	6,546	18,173	83,751	0.22
Wingecarribee	4,490	933	5,423	40,241	0.13
Region	30,307	23,441	53,748	369,506	0.15

Clean up and drop off specific data can be accessed at Appendix A.

Performance Analysis

On a regional level, the average total waste generation collected in all kerbside bins is around 18 kg/household/week and 7.4 kg/person/week. Analysis of the total tonnes disposed to landfill per capita from all the domestic waste streams (including clean up and drop off waste) shows that due to the AWT, Wingecarribee has the lowest tonnes disposed per capita followed by Kiama, whose tonnes per capita have dropped since 2006. The other Councils have remained relatively steady throughout the period.

Figure 2-8: Tonnes of Household Waste Disposed per Capita per Annum (2011/12 EPA)



Composition Studies and Audit Data

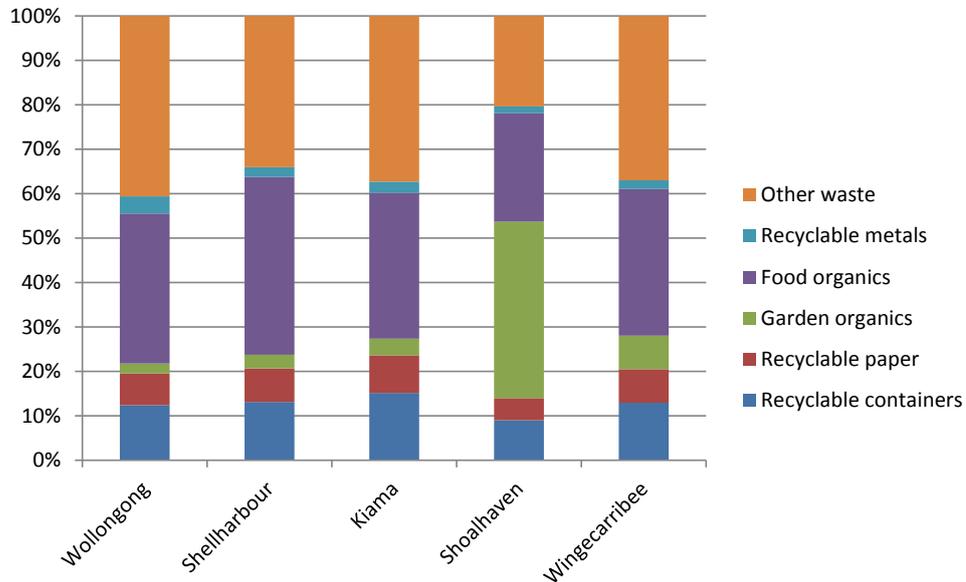
The abundant materials in the residual waste stream are set out in Table 2-5 below. The audit found that Shellharbour had the highest level of food organics; Shoalhaven had the most garden organics.

Table 2-5: Four Most Abundant Materials in the Residual Waste Stream (2011/12 EPA)

	Wollongong	Shellharbour	Kiama	Shoalhaven	Wingecarribee	Region
Paper/Card	7%	8%	8%	5%	8%	7%
Food Organics	34%	40%	33%	24%	33%	33%
Garden Organics	2%	3%	4%	40%	8%	11%
Recyclable Plastics	12%	13%	15%	9%	13%	13%
Metals	4%	2%	2%	2%	2%	2%
Potential Recoverable	59%	66%	63%	80%	63%	66%
Potential Recoverable (kg/hh/wk)	2.1	1.5	2.4	1.1	1.9	1.8

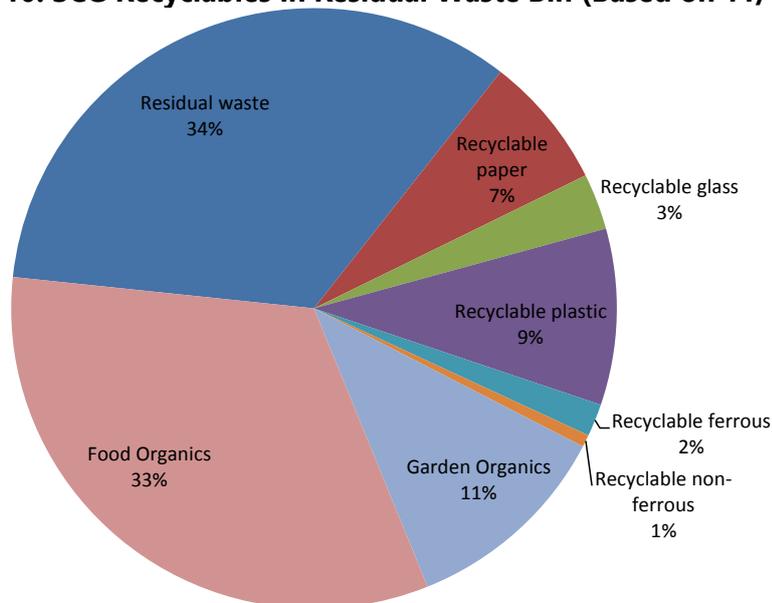
Figure 2-9 below contains a graphical representation of the above potential recoverable data, and includes the residual component making up the total 100% of the red bin.

Figure 2-9: SCG Residual Waste Bin - Composition of Recyclables by LGA (2011/12 EPA)



At a regional level, 66% of the waste is recyclable. This is made up of the streams and proportions shown in Figure 2-10 below. Organic materials are considered by the EPA as the "low hanging fruit" constituting 44% of the total.

Figure 2-10: SCG Recyclables in Residual Waste Bin (Based on 11/12 EPA Data)



Household Problem Wastes

Hazardous waste in recent audit data constitutes an average of 0.8%; a small fraction with significant ramifications. The ramifications become even more significant once treatment of mixed residual waste becomes a reality. Hazardous waste typically consists of:

- Paint
- Fluoro tubes
- Dry cell batteries
- Household chemicals
- Asbestos/building materials
- Pathogenic infectious medical
- Gas bottles.

Recycling Stream

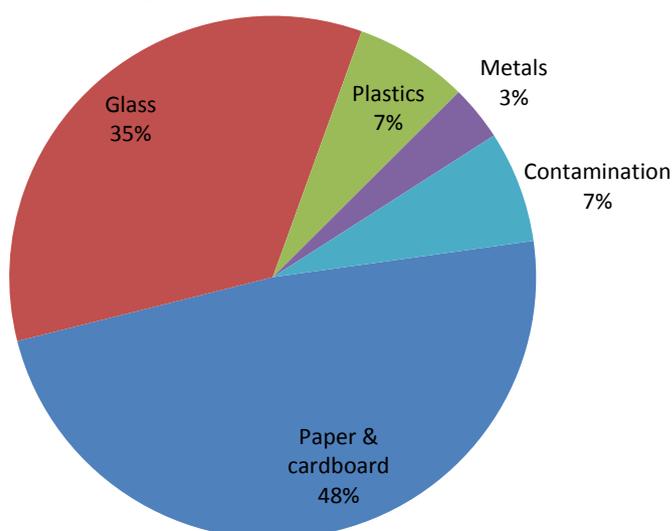
The composition of the recycling stream is relatively similar across the five councils. Kiama has the lowest level of recycling bin contamination as she following table and graph.

Table 2-6: Recycling Bin Composition (2011/12 EPA)

	Wollongong	Shellharbour	Kiama	Shoalhaven	Wingecarribee	Region
Contamination	6%	8%	4%	7%	9%	7%
Paper/cardboard	49%	49%	51%	45%	48%	48%
Glass	35%	30%	36%	40%	31%	34%
Plastics	7%	8%	6%	6%	8%	7%
Metals	3%	4%	3%	3%	4%	3%

As illustrated at Figure 2-11, paper and cardboard comprised approximately 50% of the recycling stream, and glass around 35%. Contamination levels averaged 7% regionally.

Figure 2-11: SCG Average Recycling Bin Composition (Based on 11/12 EPA Data)



Business Waste Flow Estimates

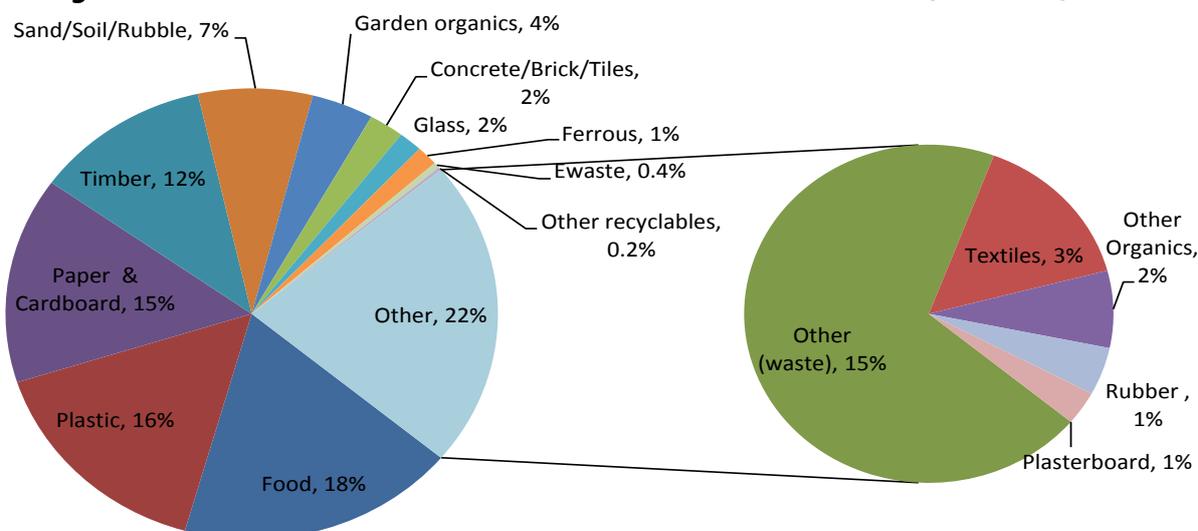
There is significant difficulty associated with obtaining accurate data for C&I and C&D waste in most regions, and the EPA does not collect the data at LGA level. Coarse estimates of composition and volume of C&I waste have been calculated and set out in this section in order to estimate C&I processing costs and benefits. Table 2-7 contains a WCS estimate of the C&I waste generated, recycled and disposed in each of the SCG councils. Tonnages generated in each LGA were estimated on a pro-rata basis using an average of population, number of people employed in local businesses and number of employing businesses.

Table 2-7: C&I Waste Tonnage Estimations (WCS Calculation from ABS & EPA Data)

Council	Generated	Recycled	Disposed
Wollongong	151,552	86,166	65,386
Shellharbour	47,183	26,826	20,357
Kiama	17,013	9,673	7,340
Shoalhaven	70,768	40,236	30,532
Wingecarribee	39,395	22,399	16,997
SCG	325,912	185,300	140,612

Figure 2-12 shows EPA waste composition audit data for NSW in the absence of regional data. Materials with valid recycling options are in the pie on the left and more difficult to recycle materials or materials not currently recycled are on the right. Approximately 80% of the materials are potentially recyclable. Food, plastics, paper, cardboard and timber are the main recyclable materials.

Figure 2-12: Commercial and Industrial Landfill Audit Data NSW (EPA Data)



Construction and Demolition Waste

In the absence of C&D waste for the region an estimate of the quantity of waste was calculated using the average of population, number of New Home Starts in each area and the number of businesses employing people. NSW compositions were assumed. There is potentially 12,000 tonnes of C&D waste being sent to landfill in the region, with the recyclable components comprising 45%. A more detailed breakdown is at Appendix A.

Current Waste and Resource Recovery Operations and Contracts

Wollongong, Shellharbour and Wingecarribee's current collection and processing contracts are currently in the final negotiation phase. This indicates that it is not practical to consider a single region-wide contract for the period of this strategy's action plan. The current contract details at the time of writing are at Appendix A. Table 2-10 below sets the current disposal arrangements contracts for the relevant waste streams.

Table 2-10: Current Disposal Contracts (Council-provided)

	Services Covered	Service Provider	Material Processed	Contract Duration	Contract Expiry date
Wollongong	Landfill	In house	Putrescible	NA	NA
Shellharbour	Landfill	In house	Putrescible	NA	NA
Kiama	Landfill	Shellharbour Council	Putrescible	NA	NA
Shoalhaven	Landfill	In house	Putrescible	NA	NA
Wingecarribee	Disposal	SITA	AWT Process of residues	15 Years	May 2024
Wollongong	Landfill	In house	Putrescible	NA	NA

Waste Management and Resource Recovery Infrastructure

Both Wollongong and Shellharbour have ample landfill capacity, owned and operated by Councils. The Shoalhaven landfill will be completed within ten years and Shoalhaven City Council is moving to procure residual waste processing services to minimise disposal requirements. Council proposes to acquire a new landfill site while to accommodate process residues and waste material that is not suitable for processing.

Shoalhaven City Council also operates ten small local transfer stations deployed across the LGA. These take the place of small local tips. Waste and recyclables deposited at these transfer stations is collected and transferred to the central waste facility at Nowra.

Kiama and Wingecarribee Councils do not currently have landfill capacity within their LGAs. Kiama Municipal Council has access to the Shellharbour landfill and Wingecarribee Shire Council has a long term contract with SITA for residual waste processing and disposal of

residues. Waste management and resource recovery operating arrangements are described more fully at Appendix A.

SCG Member Council Strategic Themes

The strategic focus of each of the LGAs has been summarised below in Table 2-11. There is significant congruence across the region.

Table 2-11: Strategic Themes of Each SCG Member Council

LGA	Strategic Themes
Wollongong	<ul style="list-style-type: none"> Waste and sustainability best practice at Whytes Gully Actively avoids, reduces, reuses, and recycles Reduce illegal dumping Litter and illegal dumping reduced Council leadership in waste management and resource recovery Domestic waste processing to maximise recovery
Shellharbour	<ul style="list-style-type: none"> Waste avoidance Increase reuse and recovery from all streams Minimise impacts of waste operations on health and environment Ensure cost effectiveness and equitability
Kiama	<ul style="list-style-type: none"> Maximise diversion Improve value for money Empower the community to contribute to sustainable waste management Community actively avoids, reduces, reuses, and recycles Resilience to change; maximisation of new opportunities
Shoalhaven	<ul style="list-style-type: none"> Recover materials from domestic waste Conserve remaining landfill space Actively avoids, reduces, reuses, and recycles Protect community from rising costs
Wingecarribee	<ul style="list-style-type: none"> Community actively avoids, reduces, reuses, and recycles Examine recovery options for source separated organic waste Ensure efficiency of collection systems

3. REVIEW OF SCG GROUP SITUATION

SCG Purpose and Waste Programs

The Southern Councils Group (SCG) is a voluntary peak organisation of Councils in the Illawarra and South Coast Regions of NSW. The group works collaboratively for better regional outcomes in waste management and various other Local Council service activities.

Preventing and cleaning up illegally dumped waste is a key SCG program. A \$0.9m funding agreement with the NSW EPA has assisted SCG to establish a Regional Illegal Dumping Prevention program across the full seven regional LGAs. The aims of the program are in line with the EPA framework and include:

- making dumping harder;
- increasing the risk of being caught;
- reducing rewards by denying financial benefits;
- removing excuses by educating and informing the community.

The NSW EPA and SCG have recently entered into a funding agreement for a *Regional Coordination Support Package* to undertake further strategic work in waste management. This includes developing the Regional Waste Strategy, identifying regional waste management and recycling needs, and maximising funding opportunities under the *Waste Less, Recycle More* initiative.

Strategic Issues and Challenges

In keeping with other Local Council services, waste management and resource recovery operations have undergone a revolution over the last 20 years. Now some 51% of municipal waste generated is recovered and recycled thanks to local government leadership, community participation and the emergence of various types of recycling technologies. In 1990 the recycling rate was around 20%. By 2021 the draft NSW *Waste Avoidance and Resource Recovery Strategy 2013-21* is proposing a 70% municipal recycling target.

Technologies and practices are now available to allow delivery of the ambitions set out in the WARR Strategy. But they come at a cost and carry some procurement and delivery risks. The do nothing option, on the other hand, is also costly as the waste disposal levy escalates each year and grant funding may not be readily available to laggard Councils.

These and other waste management pressures come at a time of emerging changes in the broader business of Local Government, in demographic and human settlement patterns, and in economic conditions.

This Section discusses some of the pressures and issues that are particularly relevant to future regional collaboration.

Recycling and Waste Processing Programs

Resource recovery is at the core of the strategic direction spelled out in the WARR Strategy and the previous recycling targets, although not yet met, have been increased in the new plan. The revised plan brings substantial pressure to further develop resource recovery initiatives.

Current Position

- The overall recycling rate for the region is 51% at 2011/12 – ahead of the NSW average of 47%. In fact, the recycling performance of all SCG member Councils exceeds the State average.
- All Councils offer kerbside recycling collection and drop off services and most achieve good yields. Most Councils offer garden waste collection and all provide for drop off services.
- One Council has recently implemented combined food and garden waste collection and processing services with commenced trials. This not only reduces disposal of some food waste, but provides the feedstock to manufacture high quality compost of great value to the community, with income from the product.

Issues & Challenges

- The 70% recycling target proposed by the EPA has been designed to be achievable (though in a recycling supply chain that is free of market failure). But a further leap will be required to bridge the Municipal recycling gap from the current average of 51% for the region to the new target 70% by 2021. This step will require two critical initiatives:
 - a) Increased performance of the kerbside recycling system.

A first step is capture of dry recyclable materials (particularly containers) that are currently discarded by residents to the red-topped household waste bins – these comprise more than 22% of the contents of red bins across the SCG region². Improved household recycling performance is achievable through increased community education, through media advertising and personal contact. This can be supplemented by enforcement action where gross non-compliance is evident. Success relies on effective communication, a measure of

² Data provided by EPA, compiled from waste bin audits undertaken in 2011.

persuasion for some households, and continuing reinforcement of messages for the majority.

A second step in improving the kerbside recycling system requires successful development and maintenance of markets for recyclate materials. The quality of sorted materials can affect both market demand and price. Where market demand and prices are persistently low, such as for glass and paper, alternative local uses may be appropriate.

b) Recovery and processing of the organic fraction of household red bin waste.

Diversion of food waste to productive uses could be achieved (albeit at high cost and risk) by acquiring a sophisticated AWT process and using the mixed red bin waste as the feedstock. The combined food and garden waste collection and processing initiatives could be extended across the region to provide economies of scale. These processes can be relatively inexpensive, straightforward and effective.

As with recycling, success in capturing and processing organic household waste must rely on community participation. But it also requires carefully matching the choice of waste processing technology with the scale of available food and garden waste. As a general rule, the more sophisticated the technology, the longer the required private sector contract term. Contract terms of 15 to 20 years are necessary for capital costs to be written-off over the full life of the equipment. This in turn presents infrastructure procurement and delivery risks that require substantial technology procurement capacity.

Approaches Considered

- Initiatives to improve recycling yield were determined to be most appropriately implemented at Council level.
- Ongoing opportunities would be assessed for regional or sub-regional waste processing, litter, and waste dumping programs to ease pressure on landfill capacity and local amenity.

Regional Coordination

The Southern Councils Group has for 10 years played a lead role in coordinating the sustainable development of the Illawarra and South Coast regions. This has included undertaking joint initiatives in a number of programs, including for waste management and resource recovery.

Current Position

- Regional coordination has been successful in building the momentum needed to get results without interference with individual Council activities and services.
- The SCG is well positioned to make a larger contribution in coordinating regional programs for improved waste management and resource recovery. The EPA has contributed funding for additional resources to strengthen regional collaboration. EPA funding may be available for additional resources to strengthen regional collaboration.

Issues & Challenges

- The basis for and scope of future regional collaboration for improved waste management needs to be considered by SCG and its member Councils. The current broad arrangements could be continued, or moderately expanded to embrace coordination of special regional services such as tackling littering and combating illegal dumping, subject to the availability of additional capacity. A further step on the collaboration hierarchy could be to jointly establish infrastructure and facilities, where cost-effective, for delivery of regional waste services. There are significant opportunities for these sorts of initiatives and a measure of funding available through the *Waste Less, Recycle More* Initiative.
- This regional strategic planning process has largely been about determining how SCG member Councils can best collaborate for regional advantage. With each SCG member Council having its own Waste Strategy as the over-riding position, the complementary regional Waste Strategy is about: "...working together, and separately". This was based on the idea of collaborating on activities and services where it is cost-effective to do so.

Approaches Considered

- A variety of levels of Regional collaboration were considered as part of the regional strategic planning process. The options essentially cover different levels of joint activity at regional and sub-regional level. Member Councils could work together on operational activities, perhaps with full SCG collaboration on policy and planning issues. Commercialisation of SCG activities could also be considered.
- An alternative approach has been proposed by the Local Government Review Panel. The final report of the Panel proposes a combination of institutional changes including amalgamations, regionally centralised service arrangements, and a basis for strategic regional planning, including for waste management. The Panel report advocated increased regional collaboration (on a variety of issues) based on the idea of creating regional *Joint Organisations* based around major regional centres (where mergers do not proceed).

Strategic Planning for Waste Management

Current Position

- All SCG member Councils recognise the need for waste management strategies that feature, as a centrepiece, some form of AWT-based waste processing.
- SCG member Councils have formal, Council-approved waste management and resource recovery strategies in place.

Issues & Challenges

- The key challenge will be to ensure that SCG *Regional Waste Avoidance and Recovery Strategy* remains aligned with the member Council strategies and that general strategic directions that broadly align with NSW Government waste strategy.
- Development of Council Asset Management Plans is a key recommendation of the recent Treasury Corporation financial sustainability review³. This is likely to increase pressure for Councils to develop formal Asset Management Plan related to waste management assets.

Approaches Considered

- With limited data on waste characterisation available, it was considered essential to undertake a region-wide waste audit and waste characterisation study to develop improved waste data as a fundamental basis for designing initiatives.
- It was determined that the focus of the regional waste strategy and programs should be on the activities that the SCG, working as a collaborative group, can undertake to improve the overall efficiency and effectiveness of waste management in the region.

Financial Capacity

In 2013 the NSW Treasury Corporation (TCorp) completed a report on the financial sustainability of all 152 NSW Local Councils⁴. The study was commissioned to provide input for the Local Government Review Panel, and assist DLG and NSW Treasury to understand the financial pressures on local government. Of key relevance to sustainable waste management is the TCorp finding that the majority of Councils are routinely in financial deficit – in fact, 102 Councils reported operating deficits in 2012.

³ NSW Treasury Corporation. *Financial Sustainability of the New South Wales Local Government Sector*. April 2013.

⁴ NSW Treasury Corporation. *ibid*.

Key recommendations include adoption of medium term pricing paths to secure long term financial sustainability – by eliminating operating deficits and achieving “...at least a breakeven operating position on an ongoing basis.” The final report of the Local Government Review canvassed the scope for Councils to raise increased revenue from fees and charges levied on services.

Current Position

- One SCG Member Council scored a *Sound* Financial Sustainability Rating (FSR) and four gained a *Moderate* FSR the Treasury Corporation Review⁵. Corresponding outlook ratings were recorded as *Negative* (one Council) and *Neutral* (four Councils).

Issues & Challenges

- Although these ratings place SCG member Councils around the centre of the FSR and Outlook distributions, the T-Corp report warns that Councils need to take action to secure long term financial sustainability – by eliminating operating deficits and achieving “...at least a breakeven operating position on an ongoing basis.” This places additional pressure to ensure cost-effective funding in delivering waste processing initiatives to meet targets proposed in the draft NSW *Waste Avoidance and Resource Recovery Strategy*.
- The T-Corp report notes the special pressures on Councils resulting from regional factors – particularly from holiday peak loads which place pressure on services.

Approaches Considered

- SCG member Councils are reviewing asset management plans for current waste facilities to ensure integration with Council financial plans and capacity of facilities to support progressive delivery of the WARR Strategy.
- SCG member Councils should consider reviewing landfill and recycling gate fees to ensure revenue covers the fully distributed whole-of-life costs of delivering waste services and maintaining and renewing landfill and material sorting assets. This review should cover specific waste streams, particularly for problem wastes and commercial wastes, including e-waste, concrete, and garden waste.
- The level of Regional collaboration could be further developed to expand the current level of infrastructure support and access available to smaller Councils, possibly on a sub-regional, node and spoke basis.

⁵ A *Moderate* rating indicates adequate financial capacity to meet financial obligations in the short to medium term.

Infrastructure and Operations

Current Position

- Wollongong and Shellharbour LGAs have secured ample landfill capacity:
 - o Wollongong has planning approval for landfill capacity that would extend the current Whytes Gully Landfill for a further 40 years of waste disposal at current input rates.
 - o Shellharbour has available some 20 years of landfill capacity.
- Shoalhaven has just 10 years landfill capacity available and is considering options for a future landfill site, while developing waste processing contract arrangements to reduce demand on landfill capacity.
- Two Councils have no landfill capacity and have developed alternative access arrangements.
- All Councils provide kerbside recycling collection services and there is some sub-regional collaboration on recyclables processing.
- Regional domestic MRF capacity is low.
- Landfill gas collection is limited.
- It appears there is no centrally located, Council-owned land suitable for a large AWT footprint around the geographic centre of the region.

The fundamental infrastructure and operations requirements for sound waste management over the next five to ten years are:

- continuing access to secure, sustainably managed landfill capacity;
- access to integrated recycling collection (and drop-off), processing and materials marketing services; and
- access to integrated organics collection (drop-off), processing and materials marketing services.

Issues & Challenges

- Despite the promise of emerging waste processing technologies, including AWTs to convert waste to compost or energy, a significant proportion of the waste stream arising in the region will, in fact, require continuing landfill disposal for the foreseeable future.
- Threats to recycling (and to a lesser extent organics resource recovery) systems are more subtle: the markets for many materials are fickle, prices are variable and

collection and transport cost to reprocessing markets can exceed materials prices on offer. This particularly applies to paper, glass and mixed plastics.

Approaches Considered

- Opportunities for consolidated regional development of critical waste processing infrastructure were considered, to build scale-economies using a lead Council to drive the initiative. Scope for a collaborative approach to residual waste processing warrants consideration following a general move by member Councils to combined food and garden waste processing.

Logistics

Current position

- The bulk of domestic waste arising in the region is moved to landfill facilities located within the LGA in which it was generated. This principle applies also the garden waste. There is obvious merit in processing or disposing of waste in proximity to where it was generated.

Issues & Challenges

- It is clear that the long, narrow spatial configuration of the region challenges the cost-effectiveness of transporting waste and recycling materials across multiple LGAs. Less clear is the idea that there may be instances where the nearest landfill for waste collected in one LGA may in fact be in the neighbouring LGA. In a truly integrated waste management system all waste would be transported to the location that minimises aggregate logistics costs.

Approaches Considered

- Previous work undertaken for SCG has revealed that the regional configuration and distances between major centres compromise potential gains from consolidating activities involving large waste volumes. It was determined that each opportunity should be considered on its merits.

Public Policy and Strategy Drivers and Trends

State and national waste policies and strategies are among the principal drivers for sustainable waste management the uptake of resource recovery technologies and practices leading to the greatly increased diversion of waste from landfill over the last decade. NSW has a comprehensive strategic regulatory and policy framework to guide and control waste management operations and practices.

- The NSW *Waste Avoidance and Resource Recovery Act 2003* provides the legislative basis for waste management through nomination of a waste hierarchy which

specifies priority for waste avoidance, reuse and recycling in preference to disposal of waste materials. The Act also provides for Extended Producer Responsibility schemes in NSW.

- The recently published draft NSW *Waste Avoidance and Resource Recovery Strategy 2013-21* updates the 2007 Strategy and contains new objectives and targets for improved waste avoidance and resource recovery, and reduced littering and illegal dumping. The recycling target for municipal waste has been increased to 70% by 2021.
- The NSW Government *Waste Less, Recycle More* initiative, announced in 2013, provides considerable opportunities for NSW Government co-funding of Local Council, NGO, and private sector recycling programs and infrastructure. An important focus of this initiative is increased recycling of food waste, plastics, timber, and paper/cardboard. The \$465 million initiative comprises five key areas:
 - A \$250 million waste and recycling infrastructure fund
 - A \$137.7 Supporting local communities fund
 - A \$58 million combating illegal dumping fund
 - A \$20 million tackling litter fund
 - Measures to improve the operation of the NSW waste disposal levy.
- The NSW *Energy from Waste* policy has recently been published. This policy is based on recognition that integrated waste management can include the recovery of energy and resources from residual waste where reuse, reprocessing and recycling pathways are not financially or technically feasible.
- The NSW *Protection of the Environment Operations Act 1997* controls the Section 88 Waste Disposal Levy. The waste levy is subject to annual increases of \$10/year plus GST.

National waste strategy has also developed new direction and is commanding more impact through policy and legislation. The National Waste Policy was strengthened in 2009 with the release of *Less Waste, More Resources*. It provides principles and focus areas to guide actions and sets key directions and priorities.

National action for producer responsibility has been taken up under COAG arrangements with federal legislation for Product Stewardship. The legislative framework for national product stewardship schemes is provided by the *Product Stewardship Act 2011*.

The National Television and Computer Recycling Scheme was established in 2011. The Regulations required importers and manufacturers of televisions and computers to join and fund an approved co-regulatory arrangement. The Regulations require industry to fund collection and recycling services to meet progressively increasing annual recycling targets, set as a proportion of the estimated total television and computer waste arising in Australia. These targets started at 30% in 2012–13 and increase to 80% by 2021–22.

Under the Clean Energy Act 2011 and emissions trading scheme, landfill operators are subject to requirements to report emissions and to acquire permits for CO₂ equivalent emissions over a set threshold of 25,000 tonnes of CO₂-e in any year. The increased cost is passed on to waste disposers.

A variety of alternative packaging resource recovery initiatives are under investigated at a national level through COAG. Container deposit schemes are included in the options being evaluated. Whatever scheme is implemented, a renewed focus is likely on recycling of beverage containers, non-beverage containers, and other types of packaging.

The Australian Packaging Covenant has introduced a co-regulatory extended producer responsibility scheme, of which NSW is a signatory, to alter packaging requirements. The focus is on sustainable packaging design, recycling of used packaging and reduction of litter from packaging. Non-signatories in NSW are subject to Part 5B of the Protection of the Environment Operations (Waste) Regulation 2005 requirements.

Review of Common Themes in UK Waste Strategies

Waste management and resource recovery strategy in the UK has been driven both by EU regulation and by the limited and declining availability of landfill capacity within the context of cultivating sustainable economic development. A review of current waste strategies of England, Scotland, Wales, and Northwest England by WCS has revealed themes that have much in common with NSW initiatives:

- A financial incentive through landfill tax to drive recycling and waste processing.
- Focus on recovery of specific materials including food waste, metals, paper/cardboard, plastics, and wood.
- Community education and awareness through widespread public place recycling infrastructure and zero-waste teaching in schools.
- Development of recycled product standards and markets.
- Industry development through funding support for local technologies and infrastructure.

- Resource efficiency through local reuse or recycling of secondary resources, and energy recovery from residual waste and Refuse Derived Fuel.

The broad vision is for all citizens and businesses to be aware of and contribute to improved resource recovery and local economic growth and value, rather than waste, potential resources.

Incentives and Barriers for Increased Resource Recovery

State and national waste policies and the strategies are among the principal drivers of the uptake of resource recovery infrastructure and the diversion of waste from landfill over the last decade. Landfill levies, for instance, are intended to provide a financial incentive for waste generators and contractors to embrace recycling solutions over landfill.

The market signal provided by the NSW waste disposal levy and the Federal Carbon Pricing Mechanism, together with landfill gate pricing has lifted the overall landfill gate price for mixed waste to around \$300/tonne. This approaches the aggregate gate pricing for mixed waste AWT processing and landfill disposal of process residuals. Note that that waste disposal levy and carbon price both apply to AWT residues.

Numerous other issues form barriers to increased resource recovery. Distance from recovery facilities to materials markets, for instance, is an important factor limiting cost-effective recycling. Progress is being made in devising initiatives for local recovery and use of materials, such as inclusion of glass in roadways and paths.

While not always strictly classified as recycling, such initiatives can result in productive uses of materials which might otherwise be discarded. A related issue is the need for scale-economy for sophisticated, expensive infrastructure such as AWT and thermal technologies. This issue brings into focus the benefits of regional collaboration for sustainable waste management.

A further barrier to increased resource recovery is the difficulty of gaining planning approval for waste resource recovery infrastructure in urban and industrial settings.

Summary of Australian and International Policy and Market Trends

The various emerging policy positions and market trends can be distilled to just a few ideas that have been instrumental in driving improved waste management in Europe, Scandinavia and Australia over the last decade (as examples). Broad ambitions for increased conservation of resources and improved environment protection set the agenda. The strategy being played out is based on two main themes:

- maximising source separation and recycling of dry, recyclable materials so that these never enter the residual waste stream; and
- reducing the amount of biodegradable waste sent direct to landfill without some form of treatment to protect the environment.

These drivers and strategic themes, together with the associated policy responses and local actions are set out diagrammatically at Table 3-1 below.

Table 3-1 Broad Policies and Trends in International and Australian Waste Management

Broad national and international objectives	Broad national and international strategy	Public policy responses	Local strategy responses
Increased conservation of resources and improved environment protection	 <p>Maximum source separation and recycling of dry materials such as plastics, metals, paper, wood, etc</p>	<ul style="list-style-type: none"> - Improve kerbside recycling yield - Improve public place recycling yield - Improve business recycling yield - Product stewardship legislation 	<ul style="list-style-type: none"> - Education and improved collection methods - Mandatory public place recycling opportunities - Increased landfill charges to drive source separation - Producer responsibility actions
	 <p>Reduce impacts of direct disposal of biodegradable waste to landfill</p>	<ul style="list-style-type: none"> - Bans on direct disposal without prior treatment - Waste disposal levies - Carbon pricing 	<ul style="list-style-type: none"> - AWT processing of organics (food & garden and mixed wastes) - Garden waste collection and processing - Increased landfill management requirements

Market and Technology Performance and Trends

Waste Processing Technology Applications

This section reviews available technologies available in Australia. It is not an attempt to document each and every facility, but to describe a representative sample of the technologies, costs, benefits, risks and operating experience in the Australian context.

There is no *silver bullet* for waste processing to provide solutions for all waste management issues. Each processing technology has its own performance characteristics, environmental and social considerations and end products which must be sold to market. Each technology requires a different and specific feedstock waste stream. As a consequence, any discussion of technology should also cover the input waste streams and the output products. The two typical waste streams considered for processing are:

- source separated organics; and
- mixed residual waste.

Source Separated Organics Streams

Source separated streams arrive at the given processing technology in a clean stream, with prior sorting having been done by the householder or the company that generated the waste. The primary streams for the purposes of this review are food waste, garden waste, and mixed food and garden waste streams from households or businesses.

The highest rates of recovery and the lowest contamination rates are achieved through source separated systems.

In the past five years private waste contractors have commenced extensive training and education programs with waste generators to ensure that source separation schemes operate effectively. Without such education and training the separation may be less than adequate, resulting in contaminated waste streams.

Mixed Residual Streams

The combined garbage stream set out in the household red topped waste bin is usually referred to as mixed residual waste. This heterogeneous waste stream is complex and requires particularly robust technologies for the initial sorting stage to separate the constituents for the second stage of processing.

Typical approaches to processing these domestic mixed waste streams involve homogenisation and sorting process steps. Facilities with some of these systems include:

- Mechanical separation – SAWT Liverpool line sorting, SITA Sydney;
- Drum separation and homogenisation – Mindarie WA and Bedminster at Cairns and Port Stephens;
- Mechanical separation and autoclave – Biomass Solutions, Coffs Harbour.

During the mechanical sorting phase, particular materials are either recovered from the material stream for recycling or removed and classified as residue for disposal. The most common materials separated for recovery in this way include glass, steel, aluminium and plastics.

Some Treatment Options

Some of the technologies used for processing domestic waste include:

- landfill – conventional, bioreactor;
- mechanical sorting – for kerbside recycling;
- mechanical-biological Treatment (MBT);
- aerobic composting – windrow, static pile, enclosed tunnel, vertical tower;
- anaerobic digestion – wet AD, dry AD;
- thermal processing – incineration, pyrolysis, gasification, plasma arc.

Each of these technologies has a unique cost, input/output, and risk profile. The following notes summarise the technologies particularly as experienced in the Australian context. The relationship between the various technologies is shown diagrammatically at Figure 3-1.

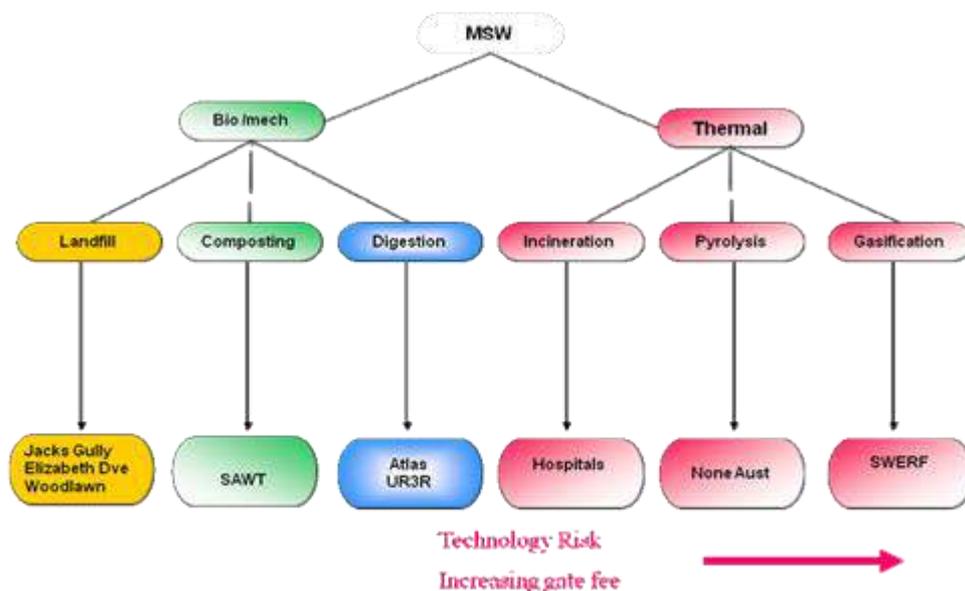


Figure 1: Treatment options and mix - Australian experience

Conventional Landfill

Approximately 21 million tonnes of waste is sent to landfill each year. Landfills in Australia range in scale from local wayside rural tips to managed facilities receiving a million tonnes/year. Most new landfills involve clay or synthetic liners to minimise external impacts from leachate and gas.

The quality and operating standards of landfills is extremely variable. The Waste Management Association of Australia estimates there are some 650 licensed and operating landfills in Australia⁶ (excluding local tips). Of these, 90% do not capture the methane gas.

Across Australia landfills produce more than 15 million tonnes of CO₂e via landfill gas (mostly methane) of which some 11 million tonnes of CO₂e escapes to the atmosphere as greenhouse gases. Only around 29% of landfill gas is captured⁷.

Bioreactor Landfill

Bioreactor landfills involve the recirculation of leachate in order to facilitate the rapid decomposition of organic matter via methanogenic bacteria within the landfill voids. Methanogenic bacteria require anaerobic conditions (the absence of oxygen) to flourish. The acceleration of methanogenic processes increases the rate of landfill gas generation which can be captured for energy in the form of electricity and heat. It also accelerates the rate of material decomposition and stabilisation of the landfill, allowing for earlier decommissioning of the gas capture system and re-use of the closed sites.

Aerobic Windrow Composting

Aerobic composting involves the use of microbial decomposition of organic waste in the presence of air. Input materials generally include green waste, grease trap waste, sludges, commercial organic material and biosolids. Windrow composting does not involve any odour capture or treatment. As a result, open windrow facilities used to process food waste, sludges and biosolids are usually isolated from adjoining properties as these processes can be odorous.

In the compost piles, microbes progressively break down the organic material in the presence of oxygen creating heat and releasing nutrients. Oxygen levels are maintained by use of compost turning to keep the heap aerated. Moisture is also required and most windrows have some sort of sprinkler system.

Windrow composting generally takes 8-20 weeks. The organic matter is heated to above 5°C to ensure pathogen and seed kill. Windrow composting is the simplest and most widely practiced composting system in Australia. More than 3 million tonnes of organic material are processed in this way each year.

Aerated Static Pile Composting

There are only a few static pile composting facilities in Australia. They involve placing the organic material (food, garden waste, biosolids, sludges, etc.) onto an aerated floor in a

⁶ WMAA Landfill Division, Landfill Audit 2009.

⁷ Australian Government. *National Waste Report*. 2010.

biocell. Air is then sucked through the compost to encourage microbial activity. Temperature is controlled by the rate of air movement through the compost. Because air is being drawn through the material there is no need for turning of the waste.

Process air is then passed through a biofilter or other odour controlling system before being discharged back to the atmosphere. Once the significant biological processes are completed (usually around six weeks) air can be blown through the waste direct to atmosphere without creating significant odour risks.

One of the largest static pile systems in Australia is the Biowise facility in Perth. It has four biocells in total, capable of processing 30,000 tonnes of mixed organic wastes including biosolids, grease trap waste, and garden waste. Once the active composting phase is completed the compost is matured in normal windrow piles for a further 4-8 weeks to ensure full maturation and stability. The material is then screened and blended with other materials to create fit for purpose products for sale.

Enclosed Tunnel Composting

The most common odour controlled composting systems, and the benchmarks for operations in Australia, are fully enclosed tunnel composting facilities. These facilities are equipped with odour and process controls, and are the system of choice for most new facilities in Australia.

Recent tunnel composting plants include the SAWT facility in Sydney with 28 tunnels, the Mindarie tunnel system, NRG in Melbourne, Remondis at Port Macquarie and J R Richards at Clarence Valley and Orange. Enclosed tunnel composting is an aerobic process with air flow in the tunnels under pressure (usually pumped through a perforated floor and up through the pile, or sucked down through the pile and a perforated floor). Temperature and moisture are also controlled.

The residence time in a tunnel can be as short as 3 weeks but 6-8 weeks is common to ensure pathogen and seed kill. Most plants utilise computerised systems to control moisture, temperature and oxygen levels. Once the first phase composting is completed the product is matured, screened and where appropriate blended to create fit for purpose products.

The Remondis plant and the Kemps Creek SAWT process clean source separated organic waste streams including food, garden waste, biosolids and grease trap waste. These produce high grade AS4454 compliant composts for an unrestricted market.

The Mindarie and SAWT Liverpool process mixed residual MSW wastes and thus produce a lower grade compost which is used in a more restricted market application (mine site rehabilitation, forestry, limited agriculture and landfill remediation).

Covered Aerobic Composting

Transpacific Industries (Cleanaway) has commercialised an aerobic technology known as the GORE system. The technology can be scaled-up to 150,000t/annum and involves traditional windrow composting methodologies situated under a purpose-designed Gortex cover system that manages both internal conditions and the escape of odours and leachate from the windrows.

Anaerobic Digestion

Commercial anaerobic digestion facilities are operating using MSW and source separated waste streams as feedstock in Europe, North America and Asia. The most successful anaerobic plants use homogenous feed stocks such as sewage sludge or animal manure. Anaerobic digestion of sewerage sludge has been common practice for 30 years.

Wet anaerobic digestion has been developed to process source separated organic waste streams to produce methane-rich gas for conversion to electricity and heat. Input streams are usually food, sludges and biosolids. The anaerobic digestion process takes place in a large reactor vessel or digester which is purpose built to enable methanogenic bacteria to process the organic lignocellulosic wastes in a water-saturated processing environment.

Dry anaerobic digestion has been developed to process both source separated organic waste streams and MSW to produce methane-rich gas for conversion to electricity, and residual digestate for compost or incineration. These dry AD systems involve the same anaerobic chemistry as the wet AD systems without the water-saturated environment.

The digestion process takes around 15-25 days and results in methane production and a residual digestate pulp which can be subsequently composted or incinerated.

Anaerobic digestion was introduced to Australia for the processing of clean stream organic wastes including sewage, biosolids and sludges. It is a commonly used system for the processing of food waste in Europe.

- The first commercial scale plant used to process mixed waste streams in Australia, was the Atlas facility in Perth. The digester was closed after several months of sporadic operation.
- The EarthPower facility in Sydney processes source separated food wastes and other organic sludges. Following early failure resulting from high levels of input contamination the facility has been acquired redeveloped, and operated by a joint venture of Veolia Environmental Services and Transpacific Industries.
- Two anaerobic digesters were operating on mixed residual household waste at the UR3R plant at Eastern Creek and the (former) WSN ArrowBio plant at Jacks Gully. The digestion systems for both plants have now been decommissioned.

Refuse Derived Fuel (RDF)

RDF, also known as Process Engineered Fuel, involves the pre-treating waste and manufacturing a relatively easily handled, high calorific fraction suitable for combustion. The pre-treatment phase helps homogenise the waste and allows for removal of materials suitable for recycling, along with wet organic materials such as food and garden wastes for separate treatment. The remaining combustible fraction (consisting of paper, card, plastic film, etc) may then either be burnt directly as a coarse flock, or compressed into dense pellets for sale as a supplement fuel in industrial boilers.

RDF is not commonly used in Australia at this time, however the SITA-ResourceCo facility in Adelaide is one example of this technology in operation where some 80,000 tonnes per annum of fuel is manufactured representing a 10% fuel substitution in the cement kilns of Adelaide Brighton Cement.

Infrastructure and Technology Procurement

Indicative Costs for AWT in NSW

In the initial days of AWT processing of waste, scant consideration was given to issues of waste variability and product refining. The mixed waste processing plants and the source separated organics composting plants were priced by the market with only basic regard for the need for:

- custom design of facilities;
- waste stream-specific process operations;
- product-specific refinement processing; and
- management of residual waste prior to landfill disposal.

History has shown that AWT processing of waste, and especially mixed wastes, to manufacture market-specific products, is orders of magnitude more complex than disposing of wastes in landfill. Therefore, it stands to reason that the pricing of AWT facilities and the gate fees for processing must be more project-specific.

Until early 2008 the cost for waste processing plants and the gate fee for processing were reasonably consistent and reasonably predictable. As recently as the 2009 report on the supply and demand of landfill capacity for metropolitan Sydney⁸, there was an expectation that landfill gate fees would exceed mixed waste AWT gate fees sometime around 2015-16. However, the global economic crisis, the legislated increase in S.88 Waste Disposal Levy, technology performance uncertainties and the 3F Gateway Exemption requirements have all

⁸ Wright, *Public Review – Landfill Capacity and Demand*, March 2009. NSW Department of Planning.

collided to adversely impact both facility capital costs and processing gate fees and lead to considerable uncertainty in the market.

At the time of writing, at least two tenders relating to AWT processing of wastes in NSW have been discontinued, another has been extended and delayed several months and one other, involving a selected preferred tenderer, has seen that party withdrawing from their position three years after being selected – all primarily due to uncertainties relating to long term pricing, project and technology risks, output product quality requirements, and financing risks. The various uncertainties have led to demands by developers for increased risk margins. The outcome is that gate fees for new projects substantially exceed those applying prior to 2008. Indeed, some local government clients have reported approaches from their AWT contractors aimed at increasing gate fees over those that were tendered and accepted a few years earlier.

With such market uncertainties, the capital cost and gate fee arrangements for future contract pricing will be very specific to the circumstances of project, risk allocation between the parties and key aspects of contract arrangements. In addition, the market tends to factor in an assessment of the alternative costs a client might face if the new facility is not brought online, which again is a very project-specific variable. On this basis, cost comparisons and reviews of historical costs can be misleading. Accordingly, independent advice on likely capital costs and gate fees is considered essential in avoiding tender price surprises.

Treatment Technology Procurement Options

The heightened market uncertainty has led to changes in the approach to procurement planning emerging in the AWT market, especially in NSW. In particular, the previous approach in which the contractor takes all risk appears to be giving way to increased risk-sharing and collaboration between contractors and clients. Early engagement with potential tenderers is now common in various types of public/private projects and extensive preliminary planning by the client has become essential in sharpening requirements. The emerging approach to procurement will see the need for more careful consideration and planning for procurement issues including:

- Pre-tender negotiations with multiple parties to clarify objectives.
- Pre-tender provision and analysis of data (e.g. waste composition and quantities) and information that will inform the procurement process and tenderers.
- Opportunity for pre-tender discovery that intending tenderers should be afforded to adequately inform themselves of the environment and circumstances surrounding the procurement.

- Careful linking of up-stream waste feedstock (collection) and down-stream product/market requirements to ensure integration of output product demand with waste inputs and that the technologies and services selected have appropriate capabilities to meet end-product specification.
- Design life of the facilities, the post-contract arrangements for the client to assume ownership/operation rights and the post-contract re-build retrofit requirements to suit the next phase of life for the facilities.
- Structured allocation of contract risks between the parties, and procurement arrangements that better reflect the preferred risk sharing in lieu of the expensive alternative of contractor taking all risk.
- The structure of tenders and performance specifications to attract quality bids aligned with procurement objectives.
- The newly heightened scrutiny and analysis of (previously undisclosed) tender assumptions and financial modelling as part of the tender assessment process.
- The significance of technical content over legal content in procurement documentation to provide contractual terms and mechanisms that can accommodate significant issues during the contract term such as:
 - o performance management;
 - o management of variations and amendments;
 - o major facility upgrades or add-ons during the term;
 - o significant shifts in financial markets;
 - o changes over time of waste quantities and composition; and
 - o end of contract hand-over arrangements.

Planning and delivering the procurement of waste management services and infrastructure is a very complex and lengthy process. Given the financial and reputation risks involved in poor decision-making, a careful, structured and adequately resourced approach is essential.

4. REGIONAL AMBITIONS AND STRATEGIC DIRECTION

This Chapter describes the ambition of the SCG for future regional collaboration, and the strategic profile or themes planned to bring about better regional outcomes in waste management and resource recovery.

Keys aspects addressed in preparing this *Regional Waste Avoidance and Recovery Strategy* are:

- Recognition that each SCG member Council has its own over-riding waste strategy.
- Scope for Councils to work collaboratively where appropriate in the interest of regional advancement, while separately implementing their own approved Council Waste Strategy.
- Opportunities for collaboration to address whole-of-region waste management and resource recovery issues and planning, and scope to jointly deliver waste infrastructure and services – particularly with potential for co-funding grants available through the *NSW Waste Less, Recycle More* initiative.

The Regional Waste Strategy is based on pursuit of the most cost-effective waste management arrangements across the region, and joint development of substantive, potentially region-wide options for better outcomes – for reduced costs, improved resource recovery, increased flexibility, and better service provision. With these ideas in mind, the strategy addresses proposals for infrastructure and systems to bring about improved recycling and take appropriate advantage of scale efficiencies.

Principles for Regional Collaboration

The SCG member Councils are committed to continued collaboration for improved waste management planning and service delivery.

Councils in the Region will:

- a) collaborate to lead the region toward sustainable waste avoidance and resource recovery using appropriate technologies and practices;
- b) collaborate to support community-wide action in managing cross-regional issues such as litter, illegal dumping and safe stewardship of problem wastes;
- c) collaborate to use their collective buying power where feasible to secure the most cost-effective waste management and resource recovery contract terms;

- d) collaborate to establish and operate waste infrastructure and facilities, where it is cost-effective and feasible to do so, in delivering regional waste services.

Themes Adopted in Waste Strategy Framework

The following Strategic Themes and Initiatives provide the framework for the plan and the basis for Regional Initiatives described in detail at Chapter 5. Action Plans for each Regional Initiative are set out at Chapter 6.

The Strategic Themes are consistent with the NSW draft *Waste Avoidance and Resource Recovery Strategy 2013-21*. The updated WARR Strategy retains the general direction for action to conserve resources and minimise harm to the environment. The strategic direction and diversion targets imply progress toward a position in which most waste is treated to yield beneficial products or reduce pollution impacts. The waste policy framework strategy promises continued program support for Local Government through the NSW *Waste Less, Recycle More* initiative; this is underpinned by a relatively high and mounting levy on waste disposal to landfill – providing an improving financial incentive for resource recovery.

Theme 1. Avoid and reduce waste generation

The progressive increase in waste generated over many years is generally regarded as a function of both population increase and economic conditions. The growth rate of municipal sector waste generation is generally regarded as a function of three main influences: population increase, product quality, and economic conditions. Initiatives for *waste avoidance* (waste not created or discarded thanks to initiatives such as product reuse, improved product life, product/package light-weighting and using products and materials more efficiently) appear to have made an impact in recent years. This has resulted in a small reduction in waste generated, despite increasing population and positive economic conditions.

This Theme seeks to build on broad state-wide initiatives to reduce the rate of waste generation.

Initiative 1a. Guide the community in reducing food waste

SCG and member Councils will work with the EPA to develop a follow-up program to build on the previous NSW Government *Love Food, Hate Waste* promotion.

Initiative 1b. Promote home composting

SCG and member Councils will prepare and promote home composting as a contribution to conserving landfill capacity and creating beneficial materials.

Initiative 1c. Promote reuse of discarded products in association with development of drop-off centres

In association with Theme 3 (Increase community reuse and recycling and improve problem waste collection) promote reuse of unwanted, used products to reduce entry of potentially reusable materials to the waste stream.

Theme 2. Increase recycling

The draft WARR Strategy sets a target of 70% municipal recycling; a 19 percentage point increase on the current average regional recycling level. With garden waste recovery and processing already in place, the next logical step in the recycling is to focus on the red residual waste bin. These garbage bins contain a high proportion of food waste and other valuable recyclable materials, some of which could have been discarded to the kerbside recycling bin.

This Theme describes regional initiative to complement established Local Council strategies.

Initiative 2. Develop waste processing facilities at Council, Sub-regional level or Regional level

SCG member Councils will progressively implement local AWT-based waste processing strategy for either food/garden waste or mixed waste. Where feasible and cost-effective, lead Councils may invite other Councils to participate, either on commercial terms or in joint venture, in local contract arrangements.

Initiative 3. Investigate the merit of a regional system to recover and recycle nappies and other absorbent hygiene products

SCG member Councils will jointly investigate development of regional collection and beneficial processing of nappies and absorbent hygiene products. This would reduce waste to landfill, reduce the contamination of source separated streams, and reduce odour complaints.

Initiative 4. Investigate the merit of establishing a regional commercial waste recycling facility

SCG member Councils currently receive and dispose of more than 100,000 tonnes of commercial waste each year. This consumes valuable landfill capacity which is difficult and costly to replace. The waste comprises cardboard, timber, metals, plastics and food, all of which are potentially valuable recycling materials. SCG and member Councils will jointly investigate the merit of establishing a regional commercial (C&I) waste materials recovery facility (MRF). The MRF would receive, recover and divert from landfill dry C&I waste loads. Landfill gate pricing could be set to provide a financial incentive for delivery of waste loads

free of food. Gate pricing could also be set to make attractive waste streaming at source in order to minimise material separation requirements at MRF.

Initiative 5. Consider processing residual waste as a long-term option Regional or Sub-regional

SCG member Councils will jointly investigate the merit of a longer-term plan for centralised AWT processing of organic-depleted residual (red bin) waste (assuming a general move to processing of domestic food/garden waste). This would ensure a critical mass of feedstock to make the scheme viable and further reduce waste to landfill.

Theme 3. Increase community reuse and recycling and improve problem waste collection

Community drop-off centres in convenient locations can be used to collect low level toxic wastes including paint, batteries, smoke alarms etc; recyclables materials such as e-waste, paper/cardboard, beverage containers, and metals; and some products suitable for reuse.

Most regional Councils across NSW already operate facilities equipped to receive these sorts of wastes. The community drop-off centre concept now embraced by the EPA draws on the success of smartly-designed, easily accessible facilities available in Germany and some parts of the UK. The EPA has further developed the idea and is counting on uniform branding and accessibility to generate patronage.

Initiative 6. Establish Drop-off Centres to collect reuse products, recycling materials, and problem wastes

SCG member Councils will collaborate or individually request funding under the NSW *Waste Less, Recycle More* initiative to establish or upgrade Drop-off Centres to collect low toxic household wastes and materials for reuse and recycling. The program could be supported with a regional education and engagement activity.

Theme 4. Reduce littering and increase public place recycling

SCG and Member Councils have prepared complimentary applications to draw on funding support to establish integrated litter reduction programs. The regional component focuses on *Community Education and Enforcement* activity. Council applications include *Litter Counts and Related Solutions*, *Bin Infrastructure*, and *Clean-up* activity.

An enlarged network of attractive public place waste and recycling bins throughout the region could contribute to both reduced litter and improved public place recycling opportunities.

Initiative 7. Upgrade and extend public place litter and recycling bin infrastructure, education and enforcement

SCG member Councils will collaborate to request funding under the NSW *Waste Less, Recycle More* initiative to upgrade public place litter and recycling infrastructure supported by regional education and engagement.

Theme 5. Reduce illegal dumping

A *Regional Illegal Dumping Prevention Strategy* has been prepared and a Regional Illegal Dumping Coordinator has been appointed to assist with the implementation of the strategy. In accordance with the Deed, all participating Councils are using the EPA data base to record illegal dumping incidents and monitor trends. A series of television advertisements has been aired across the region to raise community awareness of the problem, penalties for illegal dumping, and options for lawful disposal.

Initiative 8. Extend the regional Illegal Dumping Program with EPA funding

SCG and member Councils propose to extend the current Illegal Dumping Program and have requested funding under the NSW Government *Waste Less, Recycle More* Initiative.

Theme 6. Increase regional collaboration

With a Regional Coordinator recently appointed, the SCG secretariat already provides a regional coordination of nominated waste programs and a single point for development of region wide project funding applications. With further strengthening of capacity, the SCG secretariat could increase the strategic capability of the region and play a wider, more effective role in coordinating regional action for improved waste management and resource recovery.

Initiative 9. Strengthen the capacity the SCG secretariat to play a wider, more effective role in coordinating regional action on waste

- a) SCG member Councils will jointly work toward progressively increased collaboration to deliver cost-effective waste programs for the region, and will consider opportunities for service collaboration.
- b) SCG member Councils will continue to explore joint tendering processes, where beneficial, for waste-related services and infrastructure.
- c) SCG member Councils will, where cost effective to do so, adopt a regional approach to community waste education across a common set of waste and waste related issues including but not limited to illegal dumping, litter, waste avoidance and recycling.

5. DEVELOPMENT OF REGIONAL STRATEGY

This Chapter presents detailed description and evaluation of strategic initiatives that underpin the Strategic Themes set out at Chapter 4. During the planning process an extensive schedule of waste management and resource recovery initiatives was established by the SCG Secretariat and Council waste management representatives. These opportunities were elaborated and subjected to initial assessment and screening by the SCG/Council group in a workshop setting.

Opportunities Evaluated

The following opportunities were subjected to the full evaluation based on their potential as productive SCG collaborative initiatives:

Initiative 1	-	Waste avoidance education
Initiative 2	-	Combined food and garden waste processing facilities at regional, sub-regional or Council level
Initiative 3	-	Regional collection and processing of nappies and absorbent hygiene products
Initiative 4	-	Regional C&I recycling facility
Initiative 5	-	Regional or sub-regional residual waste processing – long term option
Initiative 6	-	Drop-off centres for improved community recycling and household problem waste capture
Initiative 7	-	Upgrade and extend public place litter & recycling bin infrastructure, education and enforcement
Initiative 8	-	Extended program to reduce illegal waste dumping
Initiative 9	-	Strengthened regional policy, program and procurement capacity

Evaluation Procedure and Results

Short-listed options were evaluated using financial Cost/Benefit analysis prepared from the perspective of the SCG Councils operating in collaboration to undertake the initiatives described. The results of the analysis, summarised at Table 5-1 below, indicate that based on conservative assumptions and estimates, all initiatives other than one have a positive net present value. Similarly, all but one initiative have positive benefit/cost ratios.

Table 5-1. Summary of Cost/Benefit Evaluation Results

Initiative		Net Present Value (NPV)	Benefit/Cost Ratio	NPV Costs	NPV Benefits
1	Waste avoidance education	\$0.07m	1.1/1.0	\$0.70m	\$0.77m
2a	Combined food and garden waste processing facilities at regional level	\$87.75m	1.7/1.0	\$126.93m	\$214.68m
2b	Combined food and garden waste processing facilities at sub-regional or Council level	\$16.18m	1.4/1.0	\$37.49m	\$53.67m
3	Regional collection and processing of nappies and absorbent hygiene products	-\$0.95m	0.9/1.0	\$8.10m	\$7.15m
4	Regional C&I recycling facility	\$31.79m	1.2/1.0	\$137.94m	\$169.73m
5	Regional or sub-regional residual waste processing – long term option	\$8.91m	1.1/1.0	\$167.23m	\$176.14m
6	Drop-off centres for improved community recycling and problem waste capture	\$18.24m	1.8/1.0	\$21.88m	\$40.12m
7	Upgrade and extend public place litter & recycling bin infrastructure, education and enforcement	\$1.52m	1.1/1.0	\$11.09m	\$12.61m
8	Extended program to reduce illegal waste dumping	\$0.4m	1.3/1.0	\$1.44m	\$1.84m
9	Strengthened regional policy, program and procurement capacity	\$0.82m	1.8/1.0	\$1.03m	\$1.85m

Main Assumptions

The main assumptions and estimates are listed below and described more fully in the report:

- a) General evaluation assumptions – these include the discount rate (7%), base year (2014/15), and evaluation period (5 to 15 years depending on initiative).
- b) Cost assumptions – essentially incremental costs brought about by adopting the opportunity, including:
 - Initiative design and implementation
 - Capital and operating costs.
- c) Benefit assumptions – essentially costs saved by SCG Councils by not proceeding with the Business as Usual Base Case.

INITIATIVE 1. WASTE AVOIDANCE EDUCATION

Description

Many household activities involve purchasing and using products, and ultimately discarding the used product or its packaging and any residual material. By being more efficient about materials actually consumed and discarded, either for disposal or recycling, societies are able to reduce the vast amount of materials that require handling, transport, processing to recycle, or disposal to landfill. A topical example is the move to electronic newspapers in lieu of the printed and distributed version. The overall outcome is greatly reduced distribution costs, waste collection costs and recycling costs (most used newspapers are recycled).

So powerful is this *materials efficiency* concept that waste avoidance is at the top of the waste hierarchy used by Australian and most international jurisdictions. The progressive increase in waste generated over many years is generally regarded as a function of three main influences: population increase, product quality, and economic conditions. The growth rate of waste generation has generally been higher than average population growth. The NSW WARR Strategy has adopted the goal to "...improve the efficient use of materials across the community and avoid generating unnecessary waste".

Is it possible for SCG and member Councils to contribute at a local level to waste avoidance? The EPA suggests that education and behaviour change are fundamental to waste avoidance. The recent *Love Food, Hate Waste* campaign was aimed at helping people to make wise food purchasing decisions, to meet short-term needs and minimise spoilage, and making use of the left-overs rather than discarding them.

The Initiative proposed has three main parts:

Guide the community in reducing food waste. SCG and member Councils will work with the EPA to develop a follow-up program to build on the previous NSW Government *Love Food, Hate Waste* promotion.

Promote home composting. SCG and member Councils will prepare and promote home composting as a contribution to conserving landfill capacity and creating beneficial materials.

Promote reuse of discarded products in association with development of drop-off centres. In association with Theme 3 (Increase community reuse and recycling and improve problem waste collection) promote reuse of unwanted, used products to reduce entry of potentially reusable materials to the waste stream.

Expected operating outcomes:

Regional collaboration through the SCG framework for an education and behaviour change program to improve community understanding about materials efficiency and waste avoidance.

Advantages of a regional approach:

A regional waste avoidance education program can reduce costs to each SCG member to deliver activities expected as part of the NSW WARR Strategy.

Potential benefits and merits:

- Potential for reduced Council campaign costs and communications improvements.
- Improved application of scarce expert resources to regional issues.

Potential costs and drawbacks:

- Increased Secretariat costs, potentially funded from external sources.

Strategic fit as a regional initiative:

- Highly relevant initiative given the existing cohesion of the region.

Potential risks:

Preliminary scan suggests two fundamental risk issues:

- Ability to measure outcomes of the program; and
- governance of the program in the interests of each member Council.

This indicates a number of potential primary risk sources:

- continuing interest and input by each Council;
- suitability of governance design and ongoing administration.

BCA Results:

This initiative can bring substantial unquantified benefits that would flow to Councils. The initiative can also assist in cost control during period of increased financial management pressure and administrative reform.

- Net present value: \$0.82 million.
- Benefit/cost ratio: 1.8/1.0.
- NPV of costs: \$1.03 million.
- NPV of benefits: \$1.85 million.

BCA Input Data:

Costs	Basis	Amount
Regional education officer	1 x \$85,000/yr x 60%	\$51,000/yr
Media and education material		\$100,000/yr
Motor vehicle costs		\$20,000/yr
Benefits		
EPA grant funding	Local government Waste and Resource Recovery Program	\$100,000/yr
Council funding		\$13,000/yr
Potential for reduced Council waste operating costs and service improvements	Say	\$50,000/yr
Improved application of scarce expert resources to regional issues	Say	\$25,000/yr
Project period		
Base year	2014/15	
End year	2018/19	

INITIATIVE 2. COMBINED FOOD AND GARDEN WASTE PROCESSING FACILITIES AT COUNCIL, SUB-REGIONAL OR REGIONAL LEVEL

Description

The SCG member Councils are conscious that some further form of waste processing using AWT technology will be necessary in order to meet NSW recycling targets and avoid increasing waste disposal levy costs. Councils are at differing levels of progress in their planning or uptake of AWT: Wingecarribee already participates in an established waste processing contract; some SCG Councils are well advanced in preparing to tender for AWT food/garden waste processing; and others are weighing-up AWT options in the context of their own particular circumstances.

SCG commissioned a study in 2009 to consider the relative merits of various types of AWT schemes operated in both regional arrangement and on a single Council basis. This study concluded that a Council-specific arrangement was best for the region. Continuation of this Council-specific approach has merit because it enables each Council to design its primary AWT process in accordance with the needs of its own residents. On the other hand, if most Councils opt for food/garden waste processing, as seems likely and is advocated by the EPA, then the options of a joint regional or sub-regional approach warrants testing as it would provide a critical mass of food and garden waste to improve financial viability.

It should be recognised that not all households will participate fully in a food (and garden) waste collection service. Some households will choose to recycle all their food waste, and their residual waste bins will be completely free of food waste; others may choose not to participate at all. Considerable community engagement will be required to build food waste capture to 50% of available discards; this would be around 30,000 tonnes/year of food waste.

With food waste covered, domestic, red-bin waste could simply be sent to landfill. However, continuing waste levy increases and a future possible reintroduction of carbon pricing, suggest that some form of treatment may be appropriate in the medium term for residual waste. A joint regional or sub-regional arrangement for AWT processing of residual waste is evaluated at Initiative 3 because this would provide the critical mass of waste to secure processing at reasonable cost.

Expected operating outcomes:

Collected food and garden waste would be transported to a mixed waste composting facility. The main aims in this processing action would be production of high quality compost suitable for sale to the local community at reasonable prices.

Advantages of a regional approach:

A regional or sub-regional contract may provide the scale economics to make this approach more affordable than a single-Council approach.

Potential benefits and merits:

- Reduced waste levy and carbon price applied to organic waste.
- Potential to reduce and control environment risk.

Potential costs and drawbacks:

- Set-up cost and long term contract required.
- A full regional scheme would necessarily require bulk transfer of significant quantities of food/garden waste resulting in additional costs. This could be overcome by adopting a sub-regional or individual Council based approach.

Strategic fit as a regional initiative:

- Relevant, resilient infrastructure to increase recycling yield, reduce waste levy and carbon price liability, and conserve landfill space over a 10-15 year timeframe.

Potential risks:

Preliminary scan suggests two fundamental risk issues:

- Reasonably high start-up cost in order to build high participation rate; and
- possibly difficult tariff negotiation between Councils.

This indicates a number of potential primary risk sources:

- need to clarify purpose and analyse comparative option costs;
- resilient agreement on cost sharing formulae;
- potential for some households to revert to discarding food waste to residual bin;
- challenge of finding suitable site.

BCA Results:

Commercially self-sustaining initiative, particularly if waste levy escalation is continued post-2016 and carbon pricing is reintroduced.

BCA results as a full regional initiative:

- Net present value: \$87.75 million.
- Benefit/cost ratio: 1.7/1.0.
- NPV of costs: \$126.93 million.
- NPV of benefits: \$214.68 million.

BCA results as a sub-regional or individual Council initiative:

- Net present value: \$16.18 million.
- Benefit/cost ratio: 1.4/1.0.
- NPV of costs: \$37.49 million.
- NPV of benefits: \$53.67 million.

BCA Input Data:

Project delivery assumption: assumed that the project is delivered on a Build, Own, Operate, Transfer basis with the plant sited on Council land and lease costs included in process contract costs. If one Council provides a site and hosts the facility, then commercial lease costs would be shared between the partnering Councils.

Project term is 15 years.

Waste Flows	Basis	Amount
Potentially available regional food waste	0.5 x 110,000 tonnes/yr domestic residual waste	55,000 tonnes/yr
Potentially available regional garden waste	Kerbside and drop-off garden waste	60,000 tonnes/yr
Assumed regional food waste capture	Around 50-55% food waste capture allowing for non-participants and part contributors	~30,000 tonnes/yr
Assumed regional garden waste capture	Around 80-85% allowing for drop-off to outlying depots	~50,000 tonnes/yr
Food & garden waste (green bin) regional collection	Total of food and garden waste captured	80,000 tonnes/yr
Sub-regional option	Total of food and garden waste captured	20,000 tonnes/yr
Costs		
Program planning and procurement – full regional option		\$500,000 one-off
Program planning and procurement – sub-regional option		\$250,000 one-off
Community education and engagement costs	1 EFT x \$70,000/year in year 1; then included as part of waste processing contract Plus materials and media	\$70,000 one-off \$50,000
Increased collection costs	Nil: residual moves to fortnightly collection replacing garden waste collection; food/garden collected weekly replacing current residual waste collection	\$0

Food/garden waste transfer cost for inclusion only in the full regional option	50% of total x \$25/tonne = 40,000/yr x \$25	\$1.0m/yr
Food/garden waste processing cost– full regional option	30,000 + 50,000 = 80,000 tonnes x \$200/tonne	\$16.0m/yr
Food/garden waste processing cost – sub-regional option	20,000 tonnes x \$250/tonne	\$5.0m/yr
Benefits		
Increased recycling revenue	Nil, compost product owned by contractor	
Garden waste mulching and handling cost saved	50,000 tonnes x \$50/tonne	\$2.5m/yr
Landfilling costs saved	80,000 tonnes x \$300/tonne (2013/14) increasing to \$330/tonne by 2016/17	\$24.0m/yr to \$26.4m/yr
Improved amenity	No monetary valuation applied	
Project period		
Base year, planning and procurement	2014/15	
Infrastructure approvals and development	2015/16 to 2017/18	
Commissioning	2018	
End year	2032/33	

INITIATIVE 3. REGIONAL COLLECTION AND PROCESSING OF NAPPIES AND ABSORBENT HYGIENE PRODUCTS

Description

A regional food and garden waste processing contract was considered by the member Councils; it was determined that the technology could be simple and inexpensive enough to be pursued at a sub-regional or even a Council level. The councils considered nappies to be an area where the benefits of regional collaboration would be more obvious.

Nappies constitute approximately 6%⁹ of the residual waste stream and are a constant source of contamination of both recyclables and organics streams. Absorbent hygiene products (AHPs) including disposable nappies, adult incontinence products and feminine hygiene products constitute a greater percentage than the nappies alone.

Development of a collection and processing system at a regional level would enable each council to:

- reduce the frequency of the general waste bins without the associated odour and maggot complaints;
- reduce the contamination of the source separated streams;
- provide a nutrient rich product to sell to market; and
- reduce waste to landfill.

The service could be offered to residents with babies in nappies and elderly residents using incontinence products. Commercial sanitary waste collectors could recycle their material at the plant at a lower cost than landfill disposal. Waste delivered by commercial contractors serving nursing and care homes can make up a large part of the infeed.

It should be recognised that not all households with babies or elderly residents using incontinence products will participate in the collection service. Considerable community engagement will be required to capture 50%-55% of the available materials; this would be around 2,800 tonnes/year of nappy waste. To process the material into suitable compost, 50% by volume of garden waste is required.

Expected operating outcomes:

Residents generating high volumes of AHPs would be able to apply for a 40L bin which would be collected weekly. Collected AHPs would be transported to a composting facility, possibly mixed with small quantity of garden waste and shredded. At the end of the

⁹ In a Wollongong waste audit in 2009, 6.1% of the SUD and 2.4% in MUD general waste bin was nappies. In a Shellharbour audit in 2009 one sample of the general waste contained 5.1% and another 7.4% nappies.

composting process, the material would be sorted to remove the plastic waste, which would be washed, pelletised and sold. The main aims in this processing action would be production of high quality compost suitable for sale to the local community at reasonable prices.

Advantages of a regional approach:

A regional contract may provide the scale economics to make this approach more affordable than a single-Council approach.

Potential benefits and merits:

- Reduced waste levy and carbon price applied to waste.
- Potential to reduce and control environment risk.

Potential costs and drawbacks:

- Collection contract required.
- Processing contract required.

Strategic fit as a regional initiative:

- Relevant, resilient infrastructure to increase recycling yield, reduce waste levy and carbon price liability, and conserve landfill space over a 10-15 year timeframe.

Potential risks:

Preliminary scan suggests two fundamental risk issues:

- Reasonably high start-up cost in order to build high participation rate; and
- possibly difficult tariff negotiation between Councils.

This indicates a number of potential primary risk sources:

- need to clarify purpose and analyse comparative option costs;
- resilient agreement on cost sharing formulae;
- potential for low take-up of the service;
- challenge of finding suitable site; a contractor responsibility.

BCA Results:

Service is not commercially self-sustaining and would require an increased domestic waste charge or subsidy by Councils.

- Net present value: -\$0.95 million.
- Benefit/cost ratio: 0.9/1.0.

- NPV of costs: \$8.10 million.
- NPV of benefits: \$7.15 million.

BCA Input Data:

Project delivery assumption: assumed that the project is delivered on a Build, Own, Operate, Transfer basis with the plant sited on Council land and lease costs included in process contract costs. If one Council provides a site and hosts the facility, then commercial lease costs would be shared between the partnering Councils.

Project term is 10 years.

Waste Flows	Basis	Amount
Potentially available Regional AHP waste	0.06 x 84,700 tonnes/yr domestic kerbside residual waste	5,100 tonnes/yr
Assumed AHP capture	Around 55% AHP capture allowing for non-participants and part contributors	~2,800 tonnes/yr
Assumed garden waste in-feed	Around 50%	~1,400 tonnes/yr
Costs		
Program planning and procurement		\$50,000 one-off
Community education and engagement costs	0.5 EFT x \$70,000/year in year 1; then included as part of waste processing contract Plus materials and media	\$35,000 one-off \$30,000
Increased collection costs	Weekly collection in 40L bins: say 3% of 185,000 residential dwellings actually use the service ~13,000: 5,550 x \$2.50/lift x 52 weeks/yr	\$0.721m/yr
AHP processing cost	2,800 tonnes x \$150/tonne	\$560,000/yr
Benefits		
Increased recycling revenue	Nil, compost product owned by contractor	
Landfilling costs saved	2,800 tonnes x \$330/tonne	\$924,000/yr
Reduced contamination of kerbside recycling bins and garden waste bins	Say 10% of all nappies and AHP waste cause contamination and the cost of contamination removal is \$200/tonne ~500 tonnes/yr x \$200/tonne	\$100,000/yr
Improved waste service quality	No monetary valuation applied	
Project period		
Base year, planning and procurement	2014/15	

Infrastructure approvals and development	2015/16 to 2016/17
Commissioning	2016/17
End year	2025/26

INITIATIVE 4. REGIONAL COMMERCIAL WASTE RECYCLING FACILITY

Description

The NSW EPA has long pointed to the need for increased C&I recycling and has identified scope for increased recycling of paper/cardboard, plastics, metals and timber. Glass is also a candidate material. Around 80,000 tonnes of mixed C&I materials are disposed of annually in the Southern Region other than food waste.

The *Waste Less, Recycle More* initiative includes the *Waste and Recycling Infrastructure Fund* and the *Business Recycling Program*, based on the idea that infrastructure grants could stimulate recycling infrastructure projects. The SCG Councils could collaborate to develop a regional C&I resource recovery initiative. The focus of the program would be around dry C&I waste and the objectives would be to:

- maximise recovery and recycling of dry C&I waste that would otherwise be deposited in local landfills;
- avoid loss of gate revenue and establish the basis for ongoing revenue from sale of resources;
- provide local employment in a new venture.

The centre-piece of the program would be a C&I MRF at a central location. The MRF would be designed receive and recover dry mixed C&I waste loads as well as source-separated dry C&I loads. C&I loads containing putrescible material would not be accepted at the MRF and these mixed loads would continue to be directed straight to landfill.

This initiative could be accompanied by a regional policy for increased landfill gate pricing for mixed wet and dry C&I waste loads. This would provide a financial incentive for local businesses to stream their putrescible waste materials at the time the waste is generated. A premium gate price could also provide a financial incentive for waste contractors to plan front-lift collection routes to reduce the mixing of putrescible and dry waste in the same waste collection vehicle.

A recently announced EPA grant program - *Business Advisory Services Grants Program* - sets up arrangements for SMEs to receive a free-of-charge advisory and project management services to establish business waste source separation systems. Grantees for this program will include Local Councils and waste contractors. It is conceivable that a comprehensive C&I resource recovery scheme could be established and led by the Southern Councils Group.

Waste contractors would be encouraged, through MRF gate pricing pitched lower than landfill gate pricing, to take dry C&I waste loads to the MRF rather than one of the local landfills. Loads delivered to a landfill and comprising recoverable material would be

accepted at a premium price, consolidated, possibly with some collation to like materials, and transferred in bulk to the regional MRF.

Expected operating outcomes:

- Increased recycling of C&I business waste – potentially an additional 40,000 tonnes/year.
- Corresponding reduction in waste disposal to Southern Region Council landfills.
- Sale of recyclable materials to reprocessors (including paper/cardboard, plastics, metals, timber, and glass).
- Residuals from the sorting process would be sent to landfill in the short term, but in the longer term could be used to manufacture RDF.
- An increase in source-separated dry C&I waste loads received at the MRF (and at Council landfills) suitable for collation with post-MRF sorted materials without further processing.

Advantages of a regional approach:

C&I MRFs are capital intensive if resource recovery ambitions exceed the modest level achievable when sorting mixed loads using manual and small loader systems. But the mechanised MRF systems need substantive waste feedstock in order to be commercially viable. A regional approach is required to provide a critical mass of assured waste flow.

Potential benefits and merits:

- Increased landfill gate price revenue resulting from premium pricing of wet/dry C&I waste loads, and modest price increase for mixed dry C&I waste loads delivered to landfill.
- MRF gate revenue at least matching foregone landfill gate revenue and available to the program partners.
- Reduced waste to landfill.
- Recovery of recyclable materials for beneficial uses.
- Revenue from sale of recyclable materials to reprocessors, with potentially attractive prices resulting from regional consolidation.
- Potential future revenue from sale of RDF.

Potential costs and drawbacks:

- MRF upfront capital cost and operating costs.
- Reduced direct landfill gate revenue to Local Council partners (offset by new MRF gate revenue).

- Could block start-up of future private sector C&I MRF operators.
- Landfill operating costs incurred for MRF residuals.
- Potential modest cost increase to some businesses which are unwilling to separate waste materials.
- Potential minor cost increase to some waste collection contractors if it is necessary for them to modify their mixed waste collection routes (note that most contractors are already changing their collection practices).

Strategic fit as a regional initiative:

- Highly relevant, resilient infrastructure to increase recycling yield and conserve landfill space over a 10-15 year timeframe.

Potential risks:

Preliminary scan suggests two fundamental risk issues:

- delivery of intended resource recovery objectives; and
- commercial success and financial sustainability for member Councils.

This indicates a number of potential primary risk sources:

- availability of suitable Council owned land;
- program planning, design, and start-up governance;
- decisions on ownership and operation;
- continuity of waste flows;
- integrated gate pricing to maximise waste flows direct to MRF;
- stakeholder engagement – waste management sector and business waste generators.

BCA Results

This initiative can be commercially self-sustaining, especially with EPA grant funding, and could provide a valuable income source as waste derived fuels become acceptable.

- Net present value: \$31.79 million.
- Benefit/cost ratio: 1.2/1.0.
- NPV of costs: \$137.94 million.
- NPV of benefits: \$169.73 million.

BCA Input Data

- Project delivery assumption: assumed that the project is delivered on a Build, Own, Operate, Transfer basis with the plant sited on Council land and lease costs included in process contract costs. If one Council provides a site and hosts the facility, then commercial lease costs would be shared between the partnering Councils.
- Gate fees assumption: MRF gate fee is collected by Council at waste facility weighbridge, and gate fee is \$300/tonne for mixed dry C&I waste and \$150/tonne for single-stream source separated dry C&I waste.
- Wet (putrescible) C&I waste is not addressed in this initiative.
- Project term 15 years.

Waste Flows	Basis	Amount
Potentially available Regional dry C&I waste given a region-wide dry C&I waste MRF processing service – with a focus on recovering paper/cardboard, plastics, metals timber and glass	Currently 80,000 tonnes/yr candidate C&I materials to disposal, some mixed with putrescible C&I waste Assume around 40,000 tonnes/year presented as mixed dry waste suitable as MRF feedstock Assume around 20,000 tonnes/year presented as dry source-separated, single stream waste suitable for collation/aggregation without MRF requirement	60,000 tonnes/yr dry C&I recyclable material and MRF feedstock
Costs		
Program planning and procurement		\$100,000 one-off
Business education and engagement costs	0.5 EFT x \$70,000/year in year 1; then included as part of waste processing contract	\$35,000 one-off
Increased C&I sorting costs for business	Nil: assumed that source separation costs where applicable are offset by reduced gate fees	\$0
Increased waste collection costs	Nil: collection contractors are already changing collection routes to avoid mixing wet and dry C&I waste	\$0
Landfill gate fees foregone	60,000 tonnes x \$130/tonne (free of levies and taxes)	\$7.8m/yr
Dry C&I waste processing contract cost	60,000 tonnes x \$110/tonne of all waste received	\$6.6m/yr
Residue waste disposal cost (applies for first five years of operation)	Say 50% of 40,000 tonnes = 20,000 tonnes x \$330/tonne	\$6.6m/yr

RDF manufacturing contract cost from yr 9	20,000 tonnes/yr x \$40/tonne	\$800,000/yr
Residue waste disposal cost (applies for 10 yrs after first five years of operation)	Say 20% of 20,000 tonnes/yr = 4,000 tonnes x \$330/tonne	\$1.32m/yr
Benefits		
Gate price revenue	40,000 tonnes/yr x \$300/tonne 20,000 tonnes/yr x \$150/tonne	\$16.2m/yr
EPA Business Advisory Grant	\$250,000 over three years	\$250,000
Increased recycling revenue	Nil, recycle product owned by contractor	
Landfilling costs saved (assuming collected C&I waste would otherwise be sent to landfill)	60,000 tonnes/yr x \$130/tonne (free of levies and taxes)	\$7.8m/yr
Sale of RDF from year 6	Nil, RDF manufactured and owned by contractor	
Improved amenity	No monetary valuation applied	
Project period		
Base year, planning and procurement	2015/16	
Infrastructure approvals and development	2016/17	
Commissioning	2017/18	
End year	2032/33	

INITIATIVE 5. JOINT REGIONAL OR SUB-REGIONAL RESIDUAL WASTE PROCESSING FACILITY

Description

The SCG member Councils are conscious that some further form of waste processing using AWT technology will be necessary in order to meet NSW recycling targets and avoid increasing waste disposal levy costs. Councils are at differing levels of progress in their planning or uptake of AWT: Wingecarribee already participates in an established waste processing contract; some SCG Councils are well advanced in preparing to tender for AWT food/garden waste processing; and others are weighing-up AWT options in the context of their particular own circumstances.

Continuation of this Council-specific approach has merit because it enables each Council to design its primary AWT process in accordance with the needs of its own residents. If most Councils opt for food/garden waste processing, as seems likely and is advocated by the EPA (see Initiative 11), then the options of whether to process or dispose of (organic-depleted) red bin residual waste will require attention.

It should be recognised that not all households will participate fully in a food (and garden) waste collection service. Some households will choose to recycle all their food waste, and their residual waste bins will be completely free of food waste; others may choose not to participate at all, leaving around 25,000 tonnes/year of food waste in residual waste bins.

Domestic, red-bin waste could simply be sent to landfill. However, with continuing waste levy increases and a future possible reintroduction of carbon pricing, some form of treatment may be appropriate in the medium term for this residual waste. A regional or sub-regional arrangement for AWT processing of residual waste would provide the critical mass of waste to secure processing at reasonable cost.

Expected operating outcomes:

Collected residual waste would be transported to a central mixed waste AWT facility. The main aims in this processing action could be all or some of:

- recovery of organic material for composting;
- recovery of recyclable metals and plastics;
- stabilisation of residues for disposal.

Advantages of a regional approach:

A regional contract may provide the scale economics to make this approach affordable. It is unlikely to be financially viable for an individual Council to invest in AWT processing of organic-depleted mixed residual waste.

Potential benefits and merits:

- Reduced waste levy and carbon price applied to residual waste.
- Scope for increased resource recovery and manufacture of waste derived fuel.
- Potential to reduce and control environment risk.

Potential costs and drawbacks:

- Set-up cost and long term contract required.
- A full regional scheme would necessarily require bulk transfer of significant quantities of residual waste resulting in additional costs. This could be overcome by adopting a sub-regional approach.

Strategic fit as a regional initiative:

- Relevant, resilient infrastructure to increase recycling yield, reduce waste levy and carbon price liability, and conserve landfill space over a 10-15 year timeframe.

Potential risks:

Preliminary scan suggests two fundamental risk issues:

- high cost potential if beneficial products are required; and
- possibly difficult tariff negotiation between Councils.

This indicates a number of potential primary risk sources:

- need to clarify purpose and analyse comparative option costs;
- resilient agreement on cost sharing formulae;
- potential for some households to revert to discarding food waste to residual bin;
- difficulty of finding suitable site.

BCA Results:

Can be commercially self-sustaining as a full regional initiative, particularly if waste levy escalation is continued post 2016 and carbon pricing is reintroduced.

- Net present value: \$15.58 million.
- Benefit/cost ratio: 1.1/1.0.
- NPV of costs: \$160.56 million.
- NPV of benefits: \$176.14 million.

BCA Input Data:

Project delivery assumption: assumed that the project is delivered on a Build, Own, Operate, Transfer basis with the plant sited on Council land and lease costs included in

process contract costs. If one Council provides a site and hosts the facility, then commercial lease costs would be shared between the partnering Councils.

Project term is 15 years.

Waste Flows	Basis	Amount
Potentially available Regional residual waste given a region-wide food and garden waste collection and processing service	Currently 110,000 tonnes/yr domestic residual waste Around 30,000 tonnes/year transferred to the food & garden waste bin Therefore residual waste contents after food & garden waste collection: 110,000 – 30,000 tonnes/yr, including around 25,000 tonnes/yr of food waste	80,000 tonnes/yr
Costs		
Program planning and procurement		\$500,000 one-off
Community education and engagement costs	0.5 EFT x \$70,000/year in year 1; then included as part of waste processing contract	\$35,000 one-off
Increased collection costs	Nil: residual moves to fortnightly collection replacing garden waste collection; food/garden collected weekly replacing current residual waste collection	\$0
Residual waste transfer cost to waste processing host site	50% of total x \$25/tonne = 40,000/yr x \$25	\$1.0m/yr
Residual waste processing cost	80,000 tonnes x \$300/tonne	\$24.0m/yr
Residue waste disposal cost	Included in mixed waste processing cost	\$0
Benefits		
Increased recycling revenue	Nil, compost and recycle product owned by contractor	
Landfilling costs saved (assuming residual waste would otherwise be sent to landfill)	80,000 tonnes x \$330/tonne	\$26.4m/yr
Improved amenity	No monetary valuation applied	
Project period		
Base year, planning and procurement	2015/16	
Infrastructure approvals and development	2016/17 to 2018/19	
Commissioning	2019	
End year	2033/34	

INITIATIVE 6: DROP-OFF CENTRES FOR IMPROVED COMMUNITY RECYCLING & HOUSEHOLD PROBLEM WASTE CAPTURE

Description

The NSW Government *Waste Less, Recycle More* initiative includes a designated \$70 million fund to support *Improved systems for household problem wastes*. The funding is available to establish community recycling drop-off centres in prominent locations to collect low level toxic wastes including paint, batteries, smoke alarms, etc, and some recyclables such as e-waste, paper/cardboard, beverage containers, and polystyrene.

Most regional Councils across NSW already operate facilities equipped to receive these sorts of wastes. However, these facilities are mostly at landfills or transfer stations and are not broadly patronised, and may not be known to a majority of community members. The community drop-off centre concept now embraced by the EPA was first developed by the Waste Boards, drawing on the success of smartly-designed, easily accessible facilities available in Germany and some parts of the UK. The EPA has further developed the idea and is counting on uniform branding and accessibility to generate patronage.

SCG Member Councils could potentially draw on funding support to establish, and perhaps jointly brand community drop-off centres (along with EPA/NSW branding). Existing waste facility sites are ideal low-cost locations provided they are accessible. Other locations include disused service stations and industrial parks.

Expected operating outcomes:

- A convenient collection point for low toxic products best kept out of kerbside waste bins, and recyclable materials not generally accepted in kerbside recycling systems.
- A potentially substantial increase in source-separated recyclable materials delivered by the community to central locations.

Advantages of a regional approach:

Property and set-up costs are substantial for drop-off centres in prominent locations which feature drive-through convenience. The development of look-alike drop-off centres is consistent with EPA funding requirements and makes sense in the geography of the Southern Region.

Potential benefits and merits:

- Increased recycling collection at no cost.
- Scope for gate revenue on certain designated materials and products (such as lead-acid batteries) which otherwise may have been included in domestic waste bins.
- Reduced waste to landfill.

- Recovery of recyclable materials for beneficial uses.
- Revenue from sale of recyclable materials to re-processors, with potentially attractive prices resulting from regional consolidation.
- Potential reduction of illegal waste dumping and inappropriate disposal.
- Potential future revenue from sale of RDF.

Potential costs and drawbacks:

- Drop-off centre capital cost and operating costs.
- Possible reduction in landfill gate revenue as a result of C&I low toxic waste being sent to drop-off centre rather than landfill (if C&I wastes are accepted).
- Landfill operating costs incurred for drop-off centre residues.
- Community engagement costs.

Strategic fit as a regional initiative:

- Highly relevant, resilient infrastructure to better manage problem wastes, increase recycling yield and conserve landfill space over a 10-15 year timeframe.

Potential risks:

Preliminary scan suggests three fundamental risk issues:

- delivery of intended resource recovery objectives;
- contribution to reducing illegal dumping; and
- commercial viability for member Councils.

This indicates a number of potential primary risk sources:

- program planning, site location(s) selection and drop-off centre set-up;
- decisions on drop-off centre ownership and operation;
- community and stakeholder engagement.

BCA Results:

Clear commercial viability, depending on gate price levels, and reprocessing value of materials actually received. Result would be improved with EPA contribution.

- Net present value: \$18.24 million.
- Benefit/cost ratio: 1.8/1.0.
- NPV of costs: \$21.88 million.
- NPV of benefits: \$40.12 million.

BCA Input Data:

Project delivery assumption: assumed that the project is delivered on a Build, Own, Operate, Transfer basis with the plant sited on Council land and lease costs included in process contract costs. If one Council provides a site and hosts the facility, then commercial lease costs would be shared between the partnering Councils.

Project term is 15 years.

Waste Flows	Basis	Amount
Potentially available Regional recycling drop-off and problem wastes	Drop-off recycling currently to waste facilities: 10,000 tonnes/yr Kerbside clean up: 15,000 tonnes/yr Problem wastes drop-off waste to landfill: 10,000 tonnes/yr (EST)	35,000 tonnes/yr
Estimated actual capture of potentially available materials at drop-off centres	Estimated capture of potential waste: 60% of 35,000 potential waste/yr	21,000 tonnes/yr
Estimated recycling proportion of waste delivered to drop-off centres	Say 40% of the 21,000 tonnes/yr delivered waste	8,400 tonnes/yr
Costs		
Program planning and procurement of drop-off centres coordinated by SCG	Design, construction procurement and project management	\$200,000 one-off
Construction and fit-out of 5 x drop-off centres (land not included)	Say \$2m/centre x 5	\$10m
Operating and maintenance costs	Say 3 EFT/centre at \$70,000/EFT x 5 centres Utilities and maintenance \$90,000/centre/yr x 5 centres	\$1.5m/yr
Community education, and engagement costs	1 EFT x \$70,000/year	\$70,000/yr
Increased handling and transport costs for non-recyclable residues: drop-off centres to waste facilities for disposal	Say 60% of 21,000 tonnes/yr x \$20/tonne	\$252,000/yr
Residue waste disposal cost for 80% of 15,000 tonnes/yr	N/A, no extra waste generated, residue would have been disposed of in base case	\$0
Recycling (MRF) cost for 20%	Say 40% of 21,000 tonnes/yr x \$55/tonne	\$462,000/yr
Benefits		
EPA grant to subsidise capital expenditure	Say 20% of total capex	\$2.0m
Recycling revenue	Say 40% of 21,000 tonnes/yr x \$100/tonne	\$840,000/yr
Reduced bulky goods kerbside clean-up	Say 33% reduction on current 15,000 tonnes/yr bulky goods kerbside = 5,000 tonnes x \$500/tonne	\$2.50m/yr

Reduced illegal dumping		\$0/yr
Landfilling costs saved by increased recycling	40% of 21,000 tonnes/yr x \$330/tonne	\$2.772m/yr
Improved amenity	No monetary valuation applied	
Project period		
Base year, planning and procurement	2015/16	
Infrastructure approvals and development	2016/17 to 2017/18	
Commissioning	2018	
End year	2027/28	

INITIATIVE 7. UPGRADE AND EXTEND PUBLIC PLACE LITTER & RECYCLING BIN INFRASTRUCTURE, EDUCATION AND ENFORCEMENT

Description

The NSW Government *Waste Less, Recycle More* initiative includes a designated \$137.5 million fund for the *Local Government Waste and Resource Recovery Program*. This includes a designated \$70 million fund to "...improve recycling, and to tackle litter and illegal dumping". More specifically, the EPA has recently opened a \$2 million Litter Prevention Grants program for NSW Councils.

The EPA has nominated high priority sites that include:

- Industrial sites;
- Retail strips;
- Shopping malls; and
- Car parks.

Recreational parks and highways are ranked as medium priority.

SCG and Member Councils have prepared complimentary applications to draw on funding support to establish integrated litter reduction programs. The regional component focuses on *Community Education and Enforcement* activity. Council applications include *Litter Counts and Related Solutions, Bin Infrastructure, and Clean-up* activity.

These activities can be supported by and the use of EPA tools such as *Hey Tosser* and *Local Litter Check* for litter-affected sites. An enlarged network of attractive public place waste and recycling bins throughout the region could contribute to both reduced litter and improved public place recycling opportunities. A key selling proposition would be that public place bins across the region would look identical, thus reinforcing positive messages in favour of recycling and litter prevention.

The deployment of increased numbers of waste and recycling bins across the region would increase the opportunity for surreptitious placement of SME C&I waste and recycling in public place bins. A complementary initiative could be for each Council to regulate for all SMEs to enter into a designated waste management contract.

Expected operating outcomes:

- A regionally integrated litter prevention program comprising both education/enforcement and amplified public place waste and recycling infrastructure.
- Improved diversion of recyclable materials to public recycling bins.

Advantages of a regional approach:

The integrated regional approach sets a positive tone for increased personal responsibility in a community setting for managing waste and recycling. The proposal is consistent with EPA funding requirements and makes sense in the geography of the Southern Region.

Potential benefits and merits:

- Increased material suitable for recycling.
- Reduced littering clean-up, collection and disposal.
- Reduced public place deposited waste to landfill as a result of increased public place recycling collection.
- Reinforcing of recycling culture and actions.
- Potential reduction of illegal waste dumping and inappropriate disposal.
- Potentially slightly reduced landfill costs.

Potential costs and drawbacks:

- Bin capital costs and establishment costs.
- Increased collection cost.
- Increased disposal cost.
- Community education and engagement costs.
- Program planning and implementation.

Strategic fit as a regional initiative:

- Highly relevant infrastructure to reduce litter, increase recycling yield and conserve landfill space.

Potential risks:

Preliminary scan suggests two fundamental risk issues:

- delivery of resource recovery and litter reduction objectives;
- commercial viability for member Councils.

This indicates a number of potential primary risk sources:

- program planning, site location selection and set-up;
- effectiveness in community education and engagement;
- decisions on frequency of bin collection.

BCA Results:

Potentially commercially self-sustaining if accompanied by wise deployment of bins and sufficient community engagement to substantially reduce litter clean-up costs.

- Net present value: \$1.52 million.
- Benefit/cost ratio: 1.1/1.0.
- NPV of costs: \$11.09 million.
- NPV of benefits: \$12.61 million.

BCA Input Data:

Waste Flows	Basis	Amount
Proposed supplementary waste bins	600	
Proposed supplementary recycling bins	600	
Assumed collection cycles	Average 200 collections/bin/year with daily collection in warmer part of year and 1 to 2 day collection cycle in cooler part of year	
Ave waste bin contents at pickup	0.025 tonnes	
Ave recycling bin contents at pickup	0.015 tonnes	
200 collection cycles/year x 600 bin sets comprising 1 waste bin and 1 recycling bin	200 x 600 waste bin lifts = 120,000 lifts/yr 200 x 600 recycling bin lifts = 120,000 lifts/yr	3,000 waste tonnes/yr 1,800 recycle tonnes/yr
Waste source - say 50% of the collected waste from this initiative would have previously been littered; and 50% would have been deposited in other bins	Increased waste collected: 3,000 x 50%	1,500 tonnes/year
Recycling source - say 50% of the collected (potential) recycle from this initiative would have previously been littered; and 50% would have been deposited in other recycling bins	Increased recycle collected: 1,800 x 50%	900 tonnes/year
Reduced litter clean-up, collection and disposal	0.5 x 3,000 + 0.5 x 1,800	2,400 tonnes/year
Costs		
Program planning and implementation		\$25,000 one-off
Bin capital and set-up (5 year life)	\$1,000/bin set x 600 bin sets	\$0.6m capex
Bin housing cleaning and maintenance	\$500/yr x 600 bin sets	\$0.3m/yr
Community education, engagement and enforcement using a combination	Say 1 x EFT for local education Increased enforcement, say 5 LGAs x 0.5	\$70,000/yr \$175,000/yr

of local staff and EPA tools	EFT x \$70,000/yr Litter blitz events, say 4/yr x 5 LGAs x \$10,000/event x three yrs	\$200,000/yr
Waste bin set contents collection cost – marginal cost given other collections are presently taking place	\$2.50/pickup x 600 bins x 200 lifts/year	\$0.3m/yr
Disposal of increased waste collected	Would previously have been sent to landfill after street sweeping or trash rack capture	\$0
Recycling bin contents collection cost – marginal cost given other collections are presently taking place	\$2.50/pickup x 600 bins x 200 lifts/year	\$0.3m/yr
Recycling bin MRF cost	50% x 1,800 tonnes/yr x \$80/tonne	\$72,000/year
MRF residue disposal cost	50% x 900 tonnes/yr x \$310/tonne (2014/15) increasing to \$330/tonne (2016/17 and beyond)	\$139,500m/year to \$148,500m/yr
Benefits		
Increased recycling revenue	Nil, recycle owned by MRF contractor	
EPA grants to SCG Secretariat and Member Councils	Grant funding 2014/15 to 2016/17	\$0.75m/yr
EPA grant funding for litter blitz events	Litter blitz events, say 4/yr x 5 LGAs x \$10,000/event x three yrs	\$200,000/yr
Reduced litter clean-up and transport to landfill at \$600/tonne	2,400 tonnes/yr x \$600/tonne	\$1.44m/yr
Improved amenity and reinforcement of recycling culture and actions	No monetary valuation applied	
Project period		
Base year, planning, procurement and set-up	2014/15	
Program commencement	2014/15	
Infrastructure replacement	5 years	
End year	2023/24	

INITIATIVE 8. REDUCE ILLEGAL WASTE DUMPING

Description

The Southern Councils Group entered into a funding deed with the EPA in January 2013 to establish an Illegal Dumping Prevention Program in the Southern Region. The Deed provides \$900,000 in funding over the period January 2013 to June 2015. The Program involves seven Councils (Wollongong, Shellharbour, Kiama, Shoalhaven, Eurobodalla, Bega Valley and Wingecarribee) and covers an area of over 18,000 square kilometres. A *Regional Illegal Dumping Prevention Strategy* has been prepared and a Regional Illegal Dumping Coordinator has been appointed to assist with the implementation of the strategy. In accordance with the Deed, all participating Councils are using the EPA data base to record illegal dumping incidents and monitor trends. A series of television advertisements has been aired across the region to raise community awareness of the problem, penalties for illegal dumping, and options for lawful disposal.

The SCG is negotiating with the EPA for an extension of the RID program for a further two years, which would extend the program to June 2017.

The NSW Government *Waste Less, Recycle More* initiative includes a designated \$58 million fund for *Combating illegal dumping*. Following the announcement of the NSW Government *Waste Less, Recycle More* grants program for Illegal Dumping, SCG and Shoalhaven City Council have, together with land managers in the Nowra area, applied for a clean-up and prevention grant. SCG and other member Councils are considering making applications for clean-up and prevention grants in future rounds of the grants program.

Expected operating outcomes:

- A regionally coordinated program that will make the Region an unattractive and difficult place for illegal dumpers to operate.
- Community awareness of the problem of illegal dumping, its impact on the natural environment, amenity and Council operating costs. .

Advantages of a regional approach:

A coordinated Regional approach will increase the commitment of Councils to and participation in ID activities, build capacity for investigating and sharing intelligence about ID breaches and activities and increase surveillance and prosecutions. A community education program can be delivered most cost effectively when undertaken regionally.

Potential benefits and merits:

- Reduced illegal dumping, thus protecting the environment.
- Reduced clean-up requirements and costs.

Potential costs and drawbacks:

- Illegal dumping program costs including community education and engagement, strategic enforcement, and capacity building.

Strategic fit as a regional initiative:

- Highly relevant initiative to combat illegal dumping.

Potential risks:

Preliminary scan suggests two fundamental risk issues:

- delivery of reduced illegal dumping objectives;
- program costs to member Councils.

This indicates a number of potential primary risk sources:

- program planning, management and governance;
- effectiveness in community education and engagement.

BCA Results:

Would rely on EPA grant funding change behaviour

- Net present value: -\$0.4 million.
- Benefit/cost ratio: 1.3/1.0.
- NPV of costs: \$1.44 million.
- NPV of benefits: \$1.84 million.

BCA Input Data:

Waste Flows	Basis	Amount
Regional illegal dumping to be cleaned up and taken to landfill as a result of this incremental initiative	Estimate	400 tonnes/yr
Costs		
Coordination and administration		\$52,000/yr
Community engagement resources		\$50,000/yr
Operations and training		40,000/yr
Council resource supplementation		208,000/yr
Benefits		
Reduced follow-up dumping and clean-up requirement	Say 120 tonnes/yr x \$1,000/tonne incremental clean-up costs	\$120,000/yr
EPA grants to SCG Secretariat and	Grant funding 2014/15 to 2017/18	\$385,000/yr

Member Councils, extended one year
beyond initially proposed 2016/17

Improved amenity

No monetary valuation applied

Project period

Base year

2014/15

Program commencement

2014/15

End year

2018/19

INITIATIVE 9.

STRENGTHENED REGIONAL POLICY, PROGRAM & PROCUREMENT CAPACITY

Description

Each of the SCG Member Councils faces demanding strategic and operational issues in waste management and these are likely to intensify over the medium term as the Councils work toward the goals contained in the *NSW Waste Avoidance and Resource Recovery Strategy 2013-2021*. The SCG already provides a regional coordination of nominated waste programs and a single point for development of region wide project funding applications.

The SCG has recently appointed a Regional Coordinator. With further strengthening of capacity, the SCG secretariat could increase the strategic capability of the region and play a wider, more effective role in coordinating regional action for improved waste management and resource recovery, such as:

- coordinating assessment of policy options for common issues and coordinating collaborative program responses;
- coordinating planning for region-wide waste services and infrastructure required for delivery of the *NSW WARR Strategy*;
- leading/coordinating procurement of region/sub-region waste services and infrastructure;
- leading/developing regional community waste education programs and initiatives;
- developing ways to improve service efficiency through increased collaboration;
- developing and maintaining a dashboard-style waste data and performance database;
- delivering region-wide programs.

The SCG has in place effective governance arrangements and a management framework to enable performance of a larger policy, planning and coordinating role. Strengthened resourcing would provide opportunities to improve the capacity and efficiency of waste businesses in planning, policy, planning, education and procurement at a time of forthcoming major change in waste services. And it would provide a basis for consideration of future shared commercial services and integrated use of waste facilities and assets.

Expected operating outcomes:

Increased regional collaboration through the SCG framework can reduce planning and procurement risks, improve community education and bring about medium-term efficiencies and waste services improvement.

Advantages of a regional approach:

A strengthened regional strategic model can elevate the waste management function and provide further strategic capacity beyond the level already attained at present through regional collaboration.

Potential benefits and merits:

- Potential for reduced Council waste operating costs and service improvements.
- Potential to reduce and control commercial and environment regulation risk.
- Improved application of scarce expert resources to regional issues.

Potential costs and drawbacks:

- Increased Secretariat costs, potentially funded from external sources.

Strategic fit as a regional initiative:

- Highly relevant initiative given the existing cohesion of the region.

Potential risks:

Preliminary scan suggests two fundamental risk issues:

- delivery of intended resource recovery objectives; and
- governance of regional policy in context of interests of each member Council.

This indicates a number of potential primary risk sources:

- continuing interest and input by each Council;
- suitability of governance design and ongoing administration;
- staffing to achieve harmonious collaboration.

BCA Results:

This initiative can bring substantial unquantified benefits that would flow to Councils. The initiative can also assist in cost control during period of increased financial management pressure and administrative reform.

- Net present value: \$0.82 million.
- Benefit/cost ratio: 1.8/1.0.
- NPV of costs: \$1.03 million.
- NPV of benefits: \$1.85 million.

BCA Input Data:

Costs	Basis	Amount
Regional education officer	1 x \$85,000/yr x 60%	\$51,000/yr
Regional procurement officer	1 x \$85,000/yr x 60%	\$51,000/yr
Regional program officer	1 x \$100,000/yr	\$100,000/yr
Media and education material		\$30,000/yr
Motor vehicle costs		\$20,000/yr
Benefits		
EPA grant funding	Local government Waste and Resource Recovery Program	\$120,000/yr
	Regional better waste and recycling fund	\$119,000/yr
Council funding		\$13,000/yr
Potential for reduced Council waste operating costs and service improvements	Say	\$150,000/yr
Improved application of scarce expert resources to regional issues	Say	\$50,000/yr
Project period		
Base year	2014/15	
End year	2018/19	

6. ACTION PLANS

This Action Plan set out below summarises preliminary implementation actions for the initiatives outlined at Chapter 5.

Substantive funding to undertake some initiatives may potentially be available in the form of direct grants and co-funding arrangements available in the NSW Government *Waste Less, Recycle More* initiative. Other proposals may need to be funded through SCG and Council core program funding arrangements.

Theme 1: Waste Avoidance

Objective	Action	Timing	Who	Lead Groups
Household education for waste avoidance, product reuse, and increasing recycling yield	Develop education campaign based on the main theme of waste avoidance supplemented by recycling, utilising EPA education materials and resources where available	2014-15	SCG Secretariat	
	Implement education program through Regional Waste Education Officer (see theme "Increased Regional Collaboration")	2014-17	SCG/Member Councils	
Love Food/Hate Waste	Review results of previous campaign and similar campaigns in other regions in liaison with EPA		SCG Secretariat	
	Investigate funding under <i>Waste Less, Recycle More</i> initiative and progress either Regionally or by Council as appropriate		SCG/Member Councils	
	If funding provided, develop and implement project plan and administer grant		SCG/Member Councils	
Product reuse community schemes	Prepare audit of all product reuse opportunities and programs across the region		SCG Secretariat	
	Monitor progress and facilitate information sharing on procurement, commissioning and operations		SCG Secretariat	
	Develop regional/sub region/local grant funding applications where appropriate		SCG /Member Councils	
	If funding provided, develop and implement project plan and administer grant		SCG Member Councils	
Promote home composting	Investigate opportunity for regional composting program and delivery options	2014-15	SCG Secretariat and Shoalhaven City Council	

	Develop compost education program and seek proposals from providers to deliver regionally.	2015-17	SCG Secretariat	
	If cost effective, implement program accessing available grant funding.	2015-17	SCG/Member Councils	

Theme 2: Increased Recycling

Objective	Action	Timing	Who	Lead Groups
Progressively implement local AWT-based waste processing for either food/garden waste or mixed waste.	Each Council will undertake its own business case analysis and procurement process	2014-2016	Each council	
	SCG Secretariat will monitor progress and facilitate information sharing on procurement, commissioning and operations	2014-2017	SCG Secretariat	
Maximise recovery and recycling of dry C&I waste that would otherwise be deposited into local landfill.	Prepare a paper on merits and issues associated with the introduction of a regional C&I MRF and program, with consideration of potential sites and operating models and working arrangements with business	2014-2017		
	If approved in-principle, seek co-funding grant under <i>Waste Less, Recycle More</i> Waste and Recycling Infrastructure Fund and Business Advisory Services Grant program			
Investigate the merit of longer-term centralised AWT processing of organic-depleted residual (red bin) waste (assuming Council uptake of food/garden waste processing).	Review merits and costs following implementation of primary AWT schemes.	2017	SCG Secretariat	
Reduce the volume of nappies and incontinence products going to landfill through domestic red bin services	Investigate the development of a regional collection and processing system for nappies and incontinence products. Prepare a paper on merits, costs and issues associated with the initiative, from the perspectives of service recipients and SCG member Councils. Consider service procurement options.	2014/2015	SCG/Member Councils	
	If approved in-principle, proceed to a sample-scale trial to evaluate collection options and processing arrangements.	2014/2015		
	If trial successful, gain approvals and proceed to procurement.	2015/2016		

Theme 3: Increase Community Recycling and Problem Waste Collection

Objective	Action	Timing	Who	Lead Groups
SCG member Councils will collaborate or individually request <i>Waste Less, Recycle More</i> funding to establish one or two drop-off centres in accessible locations.	SCG Secretariat will monitor member Council proposals, consult with EPA on drop-off centre concept design, and review actions taken by other jurisdictions in establishing drop-off centres.	2014/2015	SCG Secretariat	
	Develop region-wide drop-off centre action plan.	2014/2015	SCG Secretariat	

Theme 4: Reduced Littering and Increased Public Place Recycling

Objective	Action	Timing	Who	Lead Groups
SCG member Councils will collaborate to increase public place recycling across the region.	Investigate options to increase public place recycling across region including the feasibility of deployment of consistent bin housing. Develop program plan, including bin set deployment, bin housing concept options, collection frequency, and cleaning and maintenance cycle. Priority locations: parks, waterways, events and CBDs.	2014/2015	SCG Member Councils	
	Apply for co-funding grant.	2014/2015	SCG Secretariat	
	Undertake regional pilot-trial to confirm cost-effectiveness of program; report trial outcomes.	2014/2015	SCG/Member Councils	
	If trial successful, finalise program plan, gain approvals and proceed to procurement.	2015/2016	SCG Member Councils	
	Develop community education and engagement plan.	2015/2016	SCG Member Councils	
Reduce littering across region	Apply for EPA litter grant funding to initiate regional litter prevention/reduction program	2013/17	SCG Member Councils	
	If funding provided, develop and implement project plan and administer grant in partnership with participating Councils	2014/15	SCG/Member Councils	
	Develop regional community education and engagement plan.	2014/15	SCG Secretariat	
	Assist Councils as required to apply for litter grant funds to address local litter issues	2013/17	SCG Secretariat	

Theme 5: Reduced Illegal Dumping

Objective	Action	Timing	Who	Lead Groups
SCG and member Councils will continue to operate the Regional Illegal Dumping Program and seek agreement from the EPA to extend and further supplement the program.	Negotiate with EPA for a two year extension to and additional funding for current RID program	2014/2015	SCG Secretariat	
	Continue to implement and refine the approved regional illegal dumping prevention strategy and communication plan			
	Investigate actions taken by other jurisdictions to reduce illegal dumping	2014/2015	SCG Secretariat	
	Develop a community education and engagement program to prevent illegal dumping	2014/2015	SCG Secretariat	
Clean up and prevent illegal dumping in known hot spots across the region	Identify hot spots in each LGA that would be suitable candidates for EPA illegal dumping clean-up and prevention program funding.			
	Work with Councils and relevant land managers to develop clean up and prevention grant applications	2014/2015	SCG Secretariat	
	Develop project plans and administer grants awarded to SCG in consultation with partner Councils / land managers			

Theme 6: Increased Regional Collaboration

Objective	Action	Timing	Who	Lead Groups
SCG and member Councils will work to strengthen collaboration to deliver cost-effective regional/sub-regional waste services and activities utilising <i>Waste Less Recycle More Grant</i> funds where possible.	Appoint Regional Coordinator and establish Regional Waste Advisory Group	2013/14	SCG Secretariat	
	Develop Regional Waste Strategy identifying regional opportunities and seek approval for strategy	2013/14	SCG/Member Councils	
	Appoint Education Officer	2014/15	SCG Secretariat	
	Scope role and requirement of Procurement Officer	2014/15	SCG Secretariat	
	Investigate opportunities including the development of cost benefit analysis and project proposals where appropriate	2014/15	SCG/Member Councils	
	Seek in principal approval from participating Councils to implement regional / sub regional initiatives	2015/16	SCG Member Councils	
	Develop applications for <i>Waste Less Recycle More Grant</i> funding (regional / sub regional / local) where appropriate	2015/16	SCG Member Councils	
	If project and funding approved, develop project plan and administer grant.	2015/16	SCG Secretariat	
SCG member Councils will conduct joint tendering, where cost-effective, for collection services, and waste & recycling processing services.	Identify joint procurement / tendering opportunities	2014/15	SCG/Member Councils	
	Develop specifications and tender documents and conduct procurement processes	2015/16	SCG/Member Councils	



APPENDIX A. Detailed Analysis of Current Situation

Population and Demographic Profile

Table A-1 provides a breakdown of the population projections and dwelling compositions for each LGA. Data for 2011 has been used to ensure comparability with the waste data provided by the EPA. The EPA definition for multi unit dwellings (MUDs) includes the ABS categories of semi-detached, row or terrace house, townhouse, flat, unit or apartment, and the single unit dwellings (SUDs) are in a category of their own.

Table A-1: Population Projection and Dwelling Composition

Council Name	Population (2011) ^a	Projected Population (2036) ^a	No. Households (2011) ^b	% SUDs (2011/12)	% MUDs (2011/12)
Wollongong	202,068	237,343	88,237	72%	28%
Shellharbour	66,218	85,629	23,811	84%	16%
Kiama	20,806	23,116	8,853	91%	9%
Shoalhaven	96,203	122,088	52,825	90%	10%
Wingecarribee	46,126	56,101	20,923	91%	9%
Region	431,421	524,277	194,649	80%	20%

a. ABS Census 2011

b. EPA data

Dwelling Composition

The following table shows the annual growth rates of both SUDs and MUDs over the same ten year period for each of the councils. The trend towards increased MUD development is prevalent throughout the region.

Table A-2: Percentage Growth of Dwelling Types: SUDs and MUDs – 2001 to 2011^a

	Wollongong	Shellharbour	Kiama	Shoalhaven	Wingecarribee	SCG
SUD	0.29%	1.08%	0.38%	0.80%	0.94%	0.62%
MUD	1.29%	1.96%	3.31%	2.55%	2.92%	1.66%

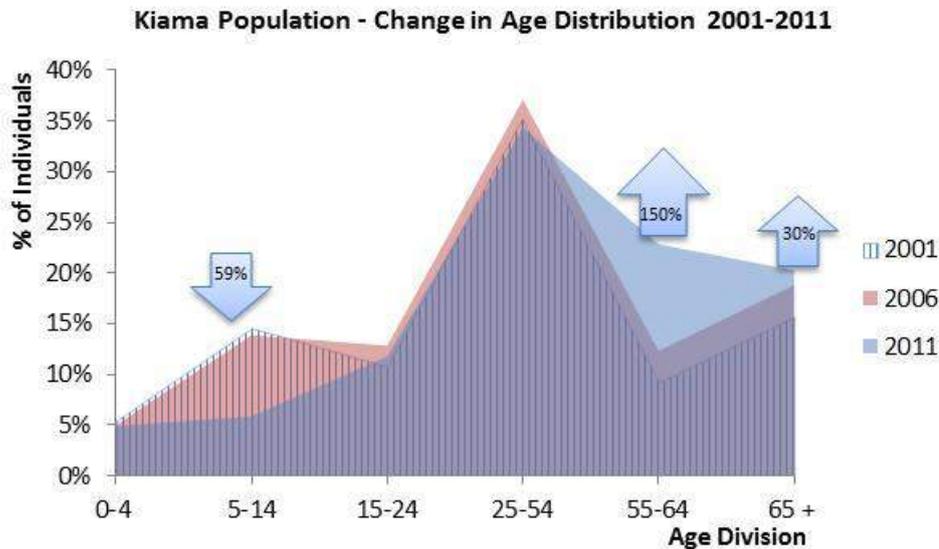
a. WCS analysis based on EPA data

Age Distribution Analysis



Analysis of the age groups within the census data in the ten year period between 2001 and 2011 (Figure A-1 below) has demonstrated an ageing trend in the population; particularly in Kiama.

Figure A-1: Change in age distribution of Kiama residents 2001-2011 (WCS analysis based on ABS data)



The other four SCG councils show a similar ageing trend to Kiama, although not to the same extent. The median age across the SCG councils has increased between 2001 and 2011, with a decrease in the percentage of individuals in the age groups 0-14 years, and increases in the percentage of individuals over 55 years of age.

Table A-3: SCG Population – Change in Age Distribution 2001-2011 (ABS)

LGA	% Change in Age Bracket					
	0-4 Decreasing	5-14 Decreasing	15-24 Variable	25-54 Variable	55-64 Increasing	65 + Increasing
Wollongong	4%	59%	Stable	Stable	19%	15%
Shellharbour	14%	11%	1% ↑	7% ↑	26%	35%
Kiama	8%	59%	Stable	3% ↓	150%	30%
Shoalhaven	10%	22%	17% ↑	9% ↑	23%	22%
Wingecarribee	14%	18%	6% ↑	13% ↓	27%	41%

Proficiency in English

The majority of the population in the SCG are proficient in English (see Table A-3) which can

allow greater ease of communication with residents and reduce the need for translation of education materials.



Table A-3: Percentage of Non-English Speaking Residents (ABS)

LGA	Residents Without English
Wollongong	14.3%
Shellharbour	8.5%
Kiama	2.0%
Shoalhaven	4.1%
Wingecarribee	2.3%
SCG	6.2%
NSW	14.6%

Waste and Resource Recovery Data

Recycling Sources

Table A-4 contains a breakdown of the recycling figure into the five recycling streams.

Table A-4: Recycling tonnages in the region (2011/12 EPA)

Council Name	Kerbside Dry	Drop off ^a	Clean up ^a	Garden (kerbside, clean up and drop off)	AWT	Total
Wollongong	16,688	1,878	840	28,998	0	48,404
Shellharbour	6,766	1,562	8	13,276	0	21,612
Kiama	2,194	256	94	3,752	0	6,296
Shoalhaven	11,806	4,413	246	11,836	0	28,301
Wingecarribee	4,653	1,767	0	2,723	3,010	12,153
Region	42,106	9,876	1,189	60,585	3,010	116,766

a. Figures do not include greenwaste

Kerbside Clean Up

Table A-5 contains a breakdown of kerbside clean up figures.

Table A-5: Kerbside Clean Up – Waste Generated and Disposed – tonnes (2011/12 EPA)

Council Name	Recovered	Disposed	Generated	Percent Recycled
Wollongong	840	3,687	4,527	19%
Shellharbour	11	50	61	18%
Kiama	94	183	278	34%



Shoalhaven	246	5,148	5,394	5%
Wingecarribee	63	0	63	100%
Region	1,254	9,069	10,324	12%

Table A-6 contains the breakdown of material types that were recycled in 2011/12 through the kerbside hard-waste collection.

Table A-6: Kerbside Clean Up – Breakdown of Material Types Recycled^a - tonnes

Council Name	(e-waste)	Garden Waste	Metal	Other	Bulky	Other Recyclables	Total Recovered
Wollongong	463				368	9	840
Shellharbour	2	3				6	11
Kiama			94				94
Shoalhaven	107		31	7	101		246
Wingecarribee		63					63
Region	572	66	125	7	469	15	1,254

a. Data provided by Wollongong did not add up to figures reported in 2011/12 data. In the absence of data that matched 2011/12 data, WCS used the proportions of the materials reported for 2012/13 to calculate 2011/12 recycling breakdown.

Drop Off Material

Table A-7 contains a breakdown of the material dropped off by residents at the various resource recovery facilities.

Table A-7: Drop Off - Materials Generated and Disposed – tonnes (2011/12 EPA)

Council Name	Dry Recyclables	Organics	Landfill	Generated	Recovered
Wollongong	1,878	3,897	5,672	11,447	50%
Shellharbour	1,562	4,774	6,370	12,706	50%
Kiama	256	878	-	1,134	100%
Shoalhaven	4,413	6,968	1,398	12,779	89%
Wingecarribee	1,767	2,660	933	5,360	83%
Region	9,876	19,177	14,372	43,425	67%

Composition Studies and Audit Data



Construction and Demolition Waste

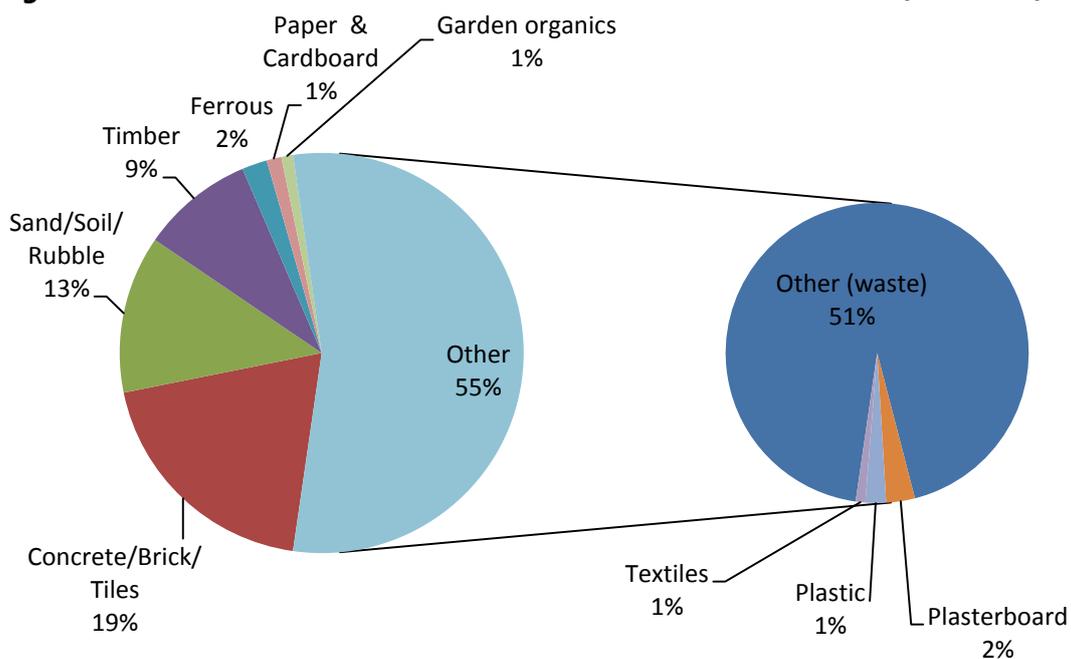
Table A-8 contains an estimate of the construction and demolition waste generated, recycled and disposed. These calculations were made by WCS using NSW data in the absence of more accurate data.

Table A-8: C&D Waste Tonnage Estimations (WCS Calculation from ABS & EPA Data)

Council Name	Generated	Recycled	Disposed
Wollongong	167,419	125,005	42,414
Shellharbour	57,922	43,248	14,674
Kiama	22,005	16,431	5,575
Shoalhaven	87,470	65,310	22,160
Wingecarribee	49,667	37,085	12,583
SCG	384,483	287,077	97,406

Figure A-2 depicts the composition of the C&D waste stream based on NSW figures. The pie on the left is the portion for which there are valid recycling options available, and the one on the right contains the more difficult to recycle materials, or materials for which there are no current recycling options in NSW. Recyclable components constitute around 45% of the materials. This figure would be higher if fuel were an option, as the "other wastes" would contain a combustible component.

Figure A-2: Construction and Demolition Landfill Audit Data NSW (EPA Data)





Current Waste and Resource Recovery Operations and Contracts

Table A-9 below contains the current collection contracts for each of the waste streams.

Table A-9. Table XX: Current Collection Contracts (Council-provided)

Council Name	Services Provided	Service Provider	Material Collected	Contract Duration	Contract Expiry
Wollongong	Kerbside waste and clean up service	Remondis	Waste Clean up	17 yrs	30/6/14
	Kerbside recycling service	Remondis	Recycling	21 yrs	30/6/14
	Kerbside garden waste service	Remondis	Garden waste	9 yrs	30/6/14
Shellharbour	Kerbside collections	Remondis	Waste	6 yrs	30/06/14
			Recycling Garden waste		
Kiama	Kerbside Domestic for urban areas	KMC	Waste	Ongoing	NA
			Recycling	Ongoing	
			Garden waste	Ongoing	
Kiama	Kerbside Domestic for rural areas	KMC	Waste	Ongoing	NA
			Recycling	Ongoing	
	Kerbside Clean up (two/yr) urban areas only	KMC	Clean up	Ongoing (under review)	NA
Shoalhaven	Kerbside garbage and recycling collection	Sita	Waste	6 yrs ext. by 3 yrs	30/6/17 ext. 30/6/20
			Recycling		
	Kerbside on-call garden and bulky waste pick up	Subloos	Garden waste Clean up	6 yrs ext. by 3 yrs	30/6/17 ext. 30/6/20
Wingecarribee	Kerbside Collection	SITA	Waste	7 yrs	30/06/13
			Recycling		
	Transport	SITA	Waste	7 yrs	30/06/13

Table A-10 below contains the current processing contracts for each of the waste streams.

Table A-10: Current Processing Contracts (Council-provided)

	Waste Stream	Service Provider	Service	Contract Duration	Contract Expiry
Wollongong	Garden organics	Remondis	Kerbside & drop off	9 years	30/6/14
	Dry recycling	Remondis	Kerbside & drop off	12 years	30/6/14
Shellharbour	Garden organics	In house	Kerbside & drop off	12 years	30/6/14
	Dry recycling	Remondis	Kerbside & drop off		
Kiama	Domestic garbage	Shellharbour Council	Kerbside & drop off		
	Dry recycling	Shoalhaven	Kerbside &		



		Recyclers	drop off		
	Garden organics	Shoalhaven Recyclers	Kerbside & drop off		
Shoalhaven	Dry recycling	Shoalhaven Recycling	Kerbside & drop off	6yrs ext. 3 years	30/6/17 ext. 30/6/20
	Dry recycling	SITA	Kerbside & drop off		
Wingecarribee	Domestic garbage	SITA	Organics-rich residual waste		

APPENDIX B. Review of SCG Council Services and Strategies

This Appendix summarises the broad waste management and resource recovery service arrangements and strategies of each of the SCG member Councils.

SCG member Councils exceed the NSW average recycling rate and are broadly committed to the general direction described in the WARR Strategy and working toward the recycling and other targets outlined in the WARR Strategy.

Wollongong City Council

Key Functional Arrangements

Waste Function	Service Delivery
Management/planning	Council staff
Collection	New contract to commence 1 July 2014
Landfill operations	WCC staff, Whytes Gully Waste & Resource Recovery Park
Waste education	WCC staff, separate division, plus collection contract provision
Call centre	WCC staff

Current Disposal and Processing Arrangements

Waste Category	Service Delivery
Domestic kerbside waste	Disposal at Whytes Gully, 40 years remaining capacity
Domestic kerbside recycling	New contract to commence 1 July 2014 via T/F at Whytes Gully
Domestic garden organics	Mulch and compost at Whytes Gully
Clean-up waste	Disposal after limited kerbside sorting for recycling
Domestic self-haul	Drop-off recycling and waste transfer station
C&I waste	Direct disposal of waste received to landfill
C&D waste	Not generally accepted
Municipal parks and gardens	Separate unit in Council – disposal organised on commercial basis
Household hazardous waste	Limited acceptance, direct disposal to landfill

Summary Waste Management Strategy

Strategic Themes	Draft Waste Strategy/Objectives
Waste and sustainability best practice at Whytes Gully	Minimise emissions, conserve landfill capacity, operate efficiently
Community actively avoids, reduces, reuses, and recycles	Support, opportunities advice and guidance to community in working toward WARR Strategy targets
Litter and illegal dumping reduced	Informed, engaged community supported by Council programs to manage litter and dumping
Council provides leadership in waste management and resource recovery	Efficient services conserving resources and protecting the environment
Domestic waste processing	Investigating AWT – Food/garden waste or mixed waste

Shellharbour City Council

Key Functional Arrangements

Waste Functions	Service Delivery
Management/planning	Council staff, Shellharbour
Collection	New contract soon to be let – fortnightly collection
Landfill operations	Council staff, Dunmore R&WDD Leachate treatment and landfill gas extraction
Waste education	Council staff plus collection contract provision
Call centre	Provided by WCC

Current Disposal and Processing Arrangements

Waste Category	Service Delivery
Domestic kerbside waste	Fortnightly collection, disposal at Dunmore Landfill
Domestic kerbside recycling	Collection fortnightly, MRF contract, Rydalmere via T/F at Whytes Gully
Domestic garden organics	Collection fortnightly, Mulch and compost, Dunmore R&WDD
Clean-up waste	Disposal after limited kerbside sorting for recycling
Domestic self-haul	Dunmore R&WDD
C&I waste	Moderate sorting and recycling
C&D waste	Moderate sorting and recycling
Municipal parks and gardens	Disposal at Dunmore R&WDD
Hazardous waste	Limited acceptance, direct disposal at Dunmore R&WDD

Summary Waste Management Strategy

Strategic Themes	Strategy/Objectives
Avoid the generation of waste	Encourage change in both Council and the community by educating, integrating and practicing waste avoidance and resource recovery.
Increase reuse and recovery from MSW, C&I and C&D sources	Hypothecate fees and charges into education, comprehensive services and infrastructure. Demonstrate that Council leads by example.
Minimise impacts of waste operations on health and environment	Provide appropriate infrastructure, services and enforcement to maximise benefits to health and environment,
Ensure cost effectiveness and equitability	Review compliance and whole of life arrangements of Council waste facilities.

Kiama Municipal Council

Key Functional Arrangements

Waste Functions	Delivery Strategy
Management/planning	Council staff
Collection	Council staff
Landfill operations	N/A – no landfill
Waste education	Council staff

Current Disposal and Processing Arrangements

Waste Category	Waste & Recovery Strategy
Domestic kerbside waste	Disposal at Dunmore R&DD
Domestic kerbside recycling	MRF contract with Shoalhaven Recycling, Bomaderry
Domestic garden organics	Shred at Minnamurra RCC, then transfer to Soilco for processing
Clean-up waste	On-call for two user pays pick-ups/year Disposal after limited Kerbside sorting for recycling of e-waste, mattresses, tyres, containers
Domestic self-haul	Drop-off at RCC of paper/cardboard, e-waste, mattresses, tyres, containers
C&I waste	Recyclable C&I accepted at RCC
C&D waste	Not accepted
Municipal parks and gardens	To Dunmore R&DD
Hazardous waste	N/A

Summary Waste Management Strategy

Strategic Themes	Strategy/Objectives
Maximise diversion	Avoid landfill costs by maximising the diversion of organics and recyclables and treating the mixed waste stream to recover any remaining materials.
Value for money	Maximise value for money in collection and processing systems
Education and communication	Empower the community to maximise outcomes
Community actively avoids, reduces, reuses, and recycles	Support, opportunities advice and guidance to community in working toward WARR Strategy targets
Resilience	Remain open to new opportunities arising from changes in the status quo

Shoalhaven City Council

Key Functional Arrangements

Waste Functions	Delivery Strategy
Management/planning	Council staff
Collection	Council staff
Landfill operations	Council staff
Waste education	Council staff

Current Disposal and Processing Arrangements

Waste Category	Waste & Recovery Strategy
Domestic kerbside waste	Disposal at West Nowra landfill, 10 years capacity
Domestic kerbside recycling	MRF contract with Shoalhaven Recycling, Bomaderry
Domestic garden organics	No garden waste collection available at 10 Council Depots across LGA compost, West Nowra
Clean-up waste	On-call for two pick-ups/year then user pays after limited kerbside sorting for recycling to Mission Australia
Domestic self-haul	Drop-off recycling and waste available to 10 depots across LGA
C&I waste	Moderate sorting and recycling
C&D waste	Moderate sorting and recycling
Municipal parks and gardens	Direct disposal to landfill
Hazardous waste	Direct disposal to landfill

Summary Waste Management Strategy

Strategic Themes	Strategy/Objectives
Recover materials from domestic waste	Completed EIS for resource recovery park Completed EOI review and will call tenders for AWT in 2014
Conserve remaining landfill space	Extend the life of the landfill and avoid levy costs by maximising the diversion of organics and recyclables and treating the mixed waste stream to recover any remaining materials.
Actively avoids, reduces, reuses, and recycles	Support, opportunities advice and guidance to community in working toward WARR Strategy targets
Protect community from rising costs	Avoid levy costs by reducing waste to landfill. Prevent future liability by diverting organic materials.

Wingecarribee Shire Council

Key Functional Arrangements

Waste Functions	Service Delivery
Management/planning	Council staff
Collection	Sita
Landfill operations	N/A no landfill
Waste education	Council staff plus contract provision
Call centre	Contract provision

Current Disposal and Processing Arrangements

Waste Category	Service Delivery
Domestic kerbside waste	AWT processing of mixed waste at Jacks Gully
Domestic kerbside recycling	Collection and processing by Sita (to June 2014)
Domestic garden organics	Currently no garden waste collection, scheduled to start in July 2014
Clean-up waste	On-call for two user pays pick-ups/year limited Kerbside sorting for recycling of e-waste, mattresses, tyres, containers Disposal after
Domestic self-haul	N/A
C&I waste	N/A no landfill
C&D waste	N/A no landfill
Municipal parks and gardens	Disposal at Jacks Gully
Hazardous waste	N/A no landfill

Summary Waste Management Strategy

Strategic Themes	Strategy/objectives
Community actively avoids, reduces, reuses, and recycles	Provide support, opportunities, advice and guidance to community. Improve recycling in public places, schools and at events. Reduce contamination. Work toward WARR Strategy targets.
Examine recovery options for organic waste	Consider introduction of source separated organics capture system.
Ensure efficiency of collection systems	Examine collection systems for improved efficiency, coverage of material types and environmental protection.