



An Australian Government Initiative



WASTE MANAGEMENT
ASSOCIATION
OF AUSTRALIA



COMPOST
AUSTRALIA

A Division of the WASTE MANAGEMENT ASSOCIATION OF AUSTRALIA

BARTON GROUP
ENVIRONMENT
INDUSTRY
DEVELOPMENT

COMPOST SUPPLY CHAIN ROADMAP

“Translating Recycled Organics into Differentiated Products”



Program Supported by:



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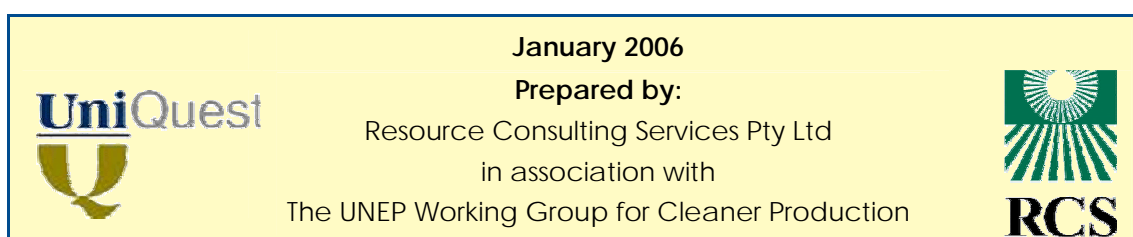


Government
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Zero Waste SA



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'There is recognition that waste issues need to be tackled more strategically across the supply chain, not just at the post-consumer stage'

'This project is an excellent example of industry groups working together, and with the federal and state governments, to achieve optimal environmental and economic outcomes'

The identity and purpose of the compost industry was highlighted in a national sense when the Australian Government, through AusIndustry, delivered a grant to assist development of the sector. The resulting Compost Supply Chain Roadmap, an initiative of the Waste Management Association of Australia, Compost Australia and the Barton Group with federal and state government support, is a strong, purposeful statement about the future development of the industry.

There is no doubt that the Australian Compost Industry is at a crossroads. Community pressure for reducing waste, increasing recycling and conserving our natural resources has resulted in governments at all levels introducing waste minimisation policies. The increase in recovered organic resources has outpaced the development of viable and sustainable markets for recycled organic products. We now face the challenge of growing the demand to meet that potential supply.

The Composting and Organics Recycling Industry is critical to achieving the beneficial use of the 10 to 15 million tonnes of organic residue generated in Australia each year. New attitudes and new skills are necessary as the sector rises to the challenge of meeting changing customer needs to deliver economic and environmental benefits without impacting human or environmental health. Commercial operations and municipal sources will become key drivers in that process as organic residues are increasingly used for improving degraded soils and establishing sustainable land management systems.

The Roadmap is intended to benefit the agricultural and related industries through widespread use of compost to enhance the productive capacity of soils and make them more resilient against adverse environmental conditions. In fact, the use of recycled organic products will extend far beyond the agricultural sector, contributing in many other ways to ecologically sustainable development. For example, the widespread use of compost has the potential to:

- assist in conserving water and in controlling pollution of urban and rural waterways;
- play an important role in countering greenhouse gas emissions through carbon sequestration; and
- support connections between rural and urban communities.

The Roadmap works hand-in-hand with the Environment Industry Action Agenda, a joint Australian Government and industry initiative. The industry-led Action Agenda includes recommendations to increase uptake of innovation by the industry; to maximise private sector participation in all new environment business opportunities; to use market mechanisms to maximise the efficient use and reuse of resources; and to take a more harmonised, national approach to environmental regulation. The Compost Roadmap provides some clear directions on how to work towards all of these goals for the compost industry.

The roadmap calls for clarity in relation to government waste policy. Regulation of waste has traditionally been a state and territory responsibility, but over the past decade there has been a trend to adopt a national approach to an increasing range of waste materials. There is recognition that waste issues need to be tackled more strategically across the supply chain, not just at the post-consumer stage. To that end, the Productivity Commission, has recently commenced a public inquiry into waste generation and resource efficiency in Australia.

I congratulate the Composting Industry on its initiative and tenacity in achieving the outcomes of the Compost Roadmap Project. There is a clear goal: the development of an environment industry with annual sales exceeding \$40 billion in 2011. The Compost Roadmap outlines the opportunities and barriers likely to be encountered on the way to meeting that goal. This project is an excellent example of industry groups working together, and with the federal and state governments, to achieve optimal environmental and economic outcomes. I look forward to seeing the industry achieve that 2011 ambition.

Ian Macfarlane MP
Australian Minister for Industry, Tourism and Resources

The situation

The Australian compost industry is at a crossroads.

On one hand, we have governments at all levels wishing to reduce the amount of waste – either by reducing inputs or increased recycling. They have used a mix of policy and pricing instruments to achieve these objectives. On the other hand, the compost industry has grown rapidly in response to Councils recognizing the need for a more sustainable use of resources i.e. recycling. As a result, this relatively young industry has grown rapidly and, in many areas, is already facing the pressures of product surpluses.

The nature of the contractual arrangements with the major feedstock generators usually results in long term contracts that make market forecasting difficult, as new contracts are let to meet the social and ecological needs of the wider community.

In other words, the supply chain is driven by a community desire to reduce disposal to landfill, with little consideration of the market's capacity to absorb the end product of compost manufacture.

The key issues

In keeping with other industries that rely on communal resources, the planning and regulatory measures are generally struggling to keep pace with the wider desires of the community. This is particularly evident with respect to the policy targets set by State EPA's (or equivalents) and the resulting mechanisms which guide both State and Local Government actions in the management of recycled organics. In short, the industry suffers through a supply chain short-circuit. **There are no clear policy or strategy positions post-diversion.**

Within the existing markets (i.e. the urban markets) there are no benchmarks established for the expected percentage of recycled organics (RO) that can be utilised before more remote markets are required. It is expected that these emerging markets will be dominated by the agricultural industry; however the use of recycled organics within the reclamation and roadside verge sectors requires consideration. In developing new markets (in particular the agricultural market), the need to demonstrate benefits, both short and longer term, is urgent.

If volumes are to be increased substantially, more considered thought is required on the pricing mechanisms necessary for recycled organics

(especially when the issue of transportation costs is factored into the equation). To assist in managing this situation, the RO industry could consider alliances with community groups calling for “eco-levies” to support intergenerational management of our natural resources, in particular our food producing land.

In tackling these issues the compost industry needs to learn from, firstly, the policy and market environments of the US and Europe and secondly, from the way in which biosolids are marketed. We see the costs of managing the biosolid supply chain as primarily the responsibility of the generator (i.e. the “polluter pays” principle). A complex relationship exists in the recycled organics supply chain between policy makers and the market realities. This requires the downstream (or market demand) factors to be very carefully assessed.



The roadmap

Following extensive stakeholder consultation, a series of strategies and actions were developed and later endorsed by key stakeholders in the areas of policy, research development and extension (RDE) and industry. As such, the strategies represent the consolidation of extensive inputs and validation by all sectors of the supply chain. The three core strategies which underpin the roadmap are:

1. Industry to influence

It was felt that a strong inclusive group capable of engaging all stakeholders be developed.

Compost should be linked with water efficiency and soil health improvements. Governments should be pushed towards a greater understanding of carbon based agriculture and soil needs. Compost should be linked with local activities and used to promote environmental awareness.

Governments should be forced to recognise the full and true costs of landfill, using appropriate

environmental economic models. Disjoints in responsibility need to be recognised and the concepts behind landfill should be clearly articulated within government policy at all levels, to ensure that the current ambiguities are reduced.

2. Marketing

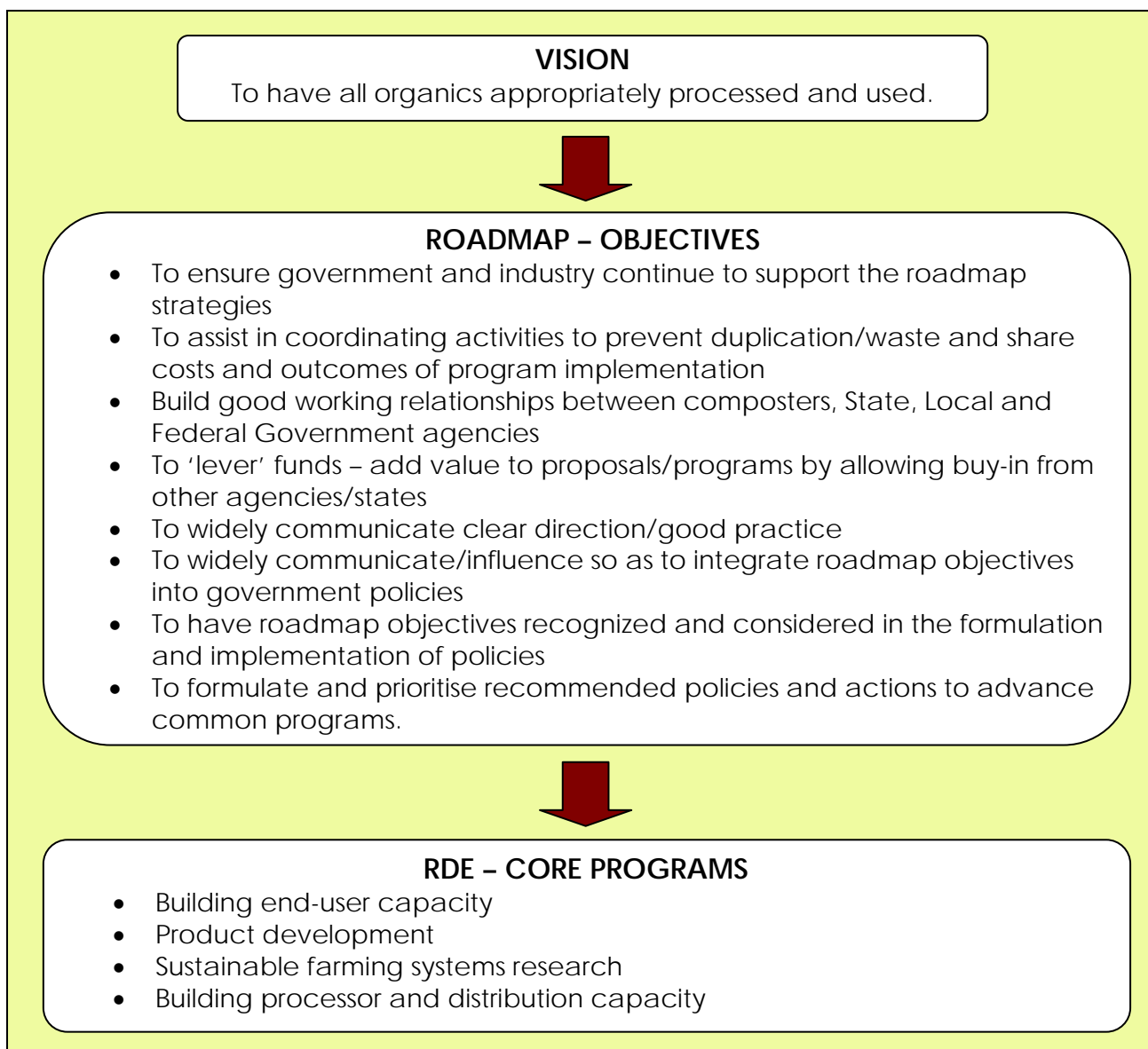
A marketing campaign that focuses on changing perceptions and defining the industry is needed. Any marketing must redefine compost outside of the waste stream, so it is a truly value-added stream and can communicate its value to customers and Councils.

A standard or “fit-for-purpose” label needs to be developed to address end-user needs and promote the idea of different quality products. Quality assurance strategies need to be pursued to ensure compliance and quality products. A code of practice (or other quality initiative) could be called for.

3. Education and research

Education is a critical element in all aspects of the chain and strategies for education within the sector, and to external stakeholders, need to be developed. An educational strategy for all aspects of the value chain is critical.

Research is a critical success factor that needs to be promoted strategically to back up education and awareness programs.



1. An Industry at the Crossroads

1.1 Background

The Australian compost industry is at a crossroads. Within Australia, we have increased, and are continuing to increase, the amount of recycled organic material we divert from landfill. However, our capacity to recycle this material within the immediate urban environment has reached, or is reaching, saturation and real prices have fallen in a number of cities during the past few years. Innovation and more intensive marketing alone will not grow the market at the rate it needs to grow. Therefore, new strategies are required for the Australian compost industry. Importantly, the relationships within the compost supply chain require re-examination to ensure that there is alignment with the policies generating supply and the needs of the various end-user markets. The absence of large agricultural sectors on the doorsteps of our major cities compounds the issue along the east coast of Australia.

To address these issues and to build a clearer picture of how urban communities should deal with the issue of increasing volumes of recycled organics (ROs), the **Compost Supply Chain Roadmap** was conceived. The study was initiated by the Waste Management Association of Australia, Compost

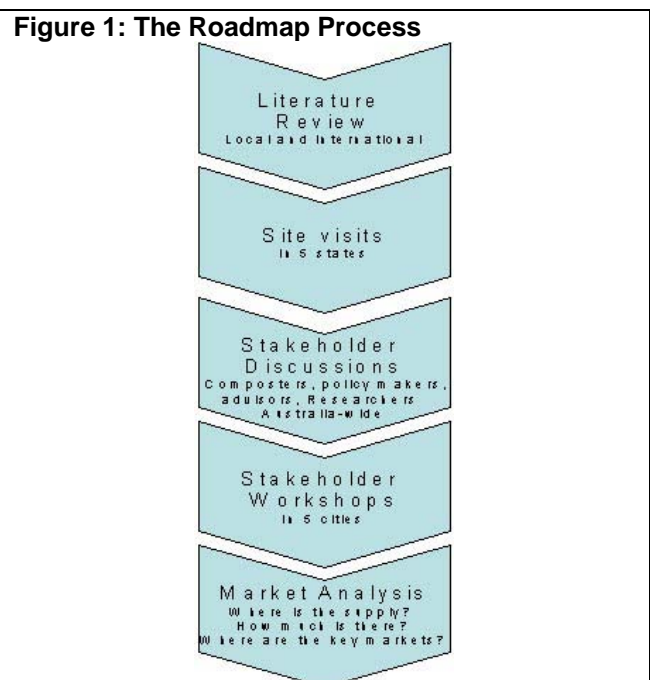
Australia and the Barton Group, with financial support from AusIndustry, State Agencies (Department of Environment & Conservation (NSW), EcoRecycle Victoria, Zero Waste SA, Queensland Environmental Protection Agency and WA Waste Management Board) and the State Working Groups of Compost Australia.

In particular, the study requested a “whole of supply chain” approach to assessing the status of the industry and the drivers of the current and future positions of the industry. In so doing, it is one of the first systematic examinations of the RO industry and its supply chain.

While the general focus was to understand the market for urban organic residues and to assist in growing the market in new areas, especially agriculture, ROs also include those products which support land reclamation or soil and crop improvements in either a raw or composted form. Specifically, these include organic residues, bio-solids, and organic by-products such as feedlot manures, chicken manures, mushroom compost, and cotton gin trash.

1.2 The Study Process

The Australian compost industry has recognised the need for clear direction and has developed this roadmap for the industry through following a multi-stakeholder review and engagement process (see Figure 1).



1.3 Industry Position Paper

An Industry Position Paper (IPP), developed in December 2004, through public consultation with industry stakeholders around the country and the most relevant Australian and international expertise, crystallised the issues facing the industry. In developing this IPP, extensive consultation with industry stakeholders occurred throughout the country, either through visits, telephone or state

workshops, and were supported by an extensive review of both national and international literature.

This document was circulated to an industry reference group of some 170 people and of those some 10 percent provided valuable written feedback to the draft report.

1.4 Conference Series

In February and March 2005, a series of conferences and workshops were conducted in five Australian capital cities. These events included a summary of the IPP, presentations from domestic and international experts on policy and best practice examples for RO management along the supply chain.

Supporting actions for these strategies were also identified; many of which had commenced by the time the Roadmap Outcome Workshops were completed.

Conference attendees workshopped the constraints facing the industry and provided valuable input into strategies to overcome these constraints.

The issues facing the industry and the outcomes of the workshops are discussed in detail in separate documents. This document highlights the most important issues facing the industry and the general consensus on how it can best move forward.

1.5 Roadmap Outcomes

The findings of this study and the strategies and actions identified within each state were presented firstly to a national reference group of policy, regulators, implementation agencies and industry representatives and, secondly to a group of research, development and extension personnel. The meetings of these two groups consolidated the various state findings and provided essential validation of the general findings of the RCS/UNEP consulting team.

These findings were then presented to workshops in each the five major capital cities and nine regional centres.

In keeping with the general thrust of engagement along the supply chain, these workshops focused on ensuring stakeholders were aware of the findings and then sought commitment for localised actions to ensure that the handover to industry was not stalled.

1.6 A Process of Continuing Engagement

As indicated previously, this Roadmap has been one of continuous engagement and, in the process, has resulted in a number of significant milestones:

As this report was being prepared initiatives resulting from the conference series were already being implemented in all states. It has been encouraging to see.

Wide industry support and input

- Some 170 people have obtained a copy of the IPP
- In excess of 440 attendees at the conference series
- Around 360 attendees at the outcome workshops with an estimated 20 percent of those having attended the conference series

In total, it is estimated that more than 600 stakeholders have actively participated in the study.

Further actions committed to at each Outcomes Workshop

At each of the workshops, participants identified local actions that could be initiated and responsibility for implementation of these actions was agreed upon. Responsibility was shared between members at each meeting thus reducing the onus on a select few. Importantly, a follow-up system was agreed to with a commitment to meet in 12 months time. In total there were in excess of 100 individual actions agreed to.

Actions commencing and being completed before the end of this process.

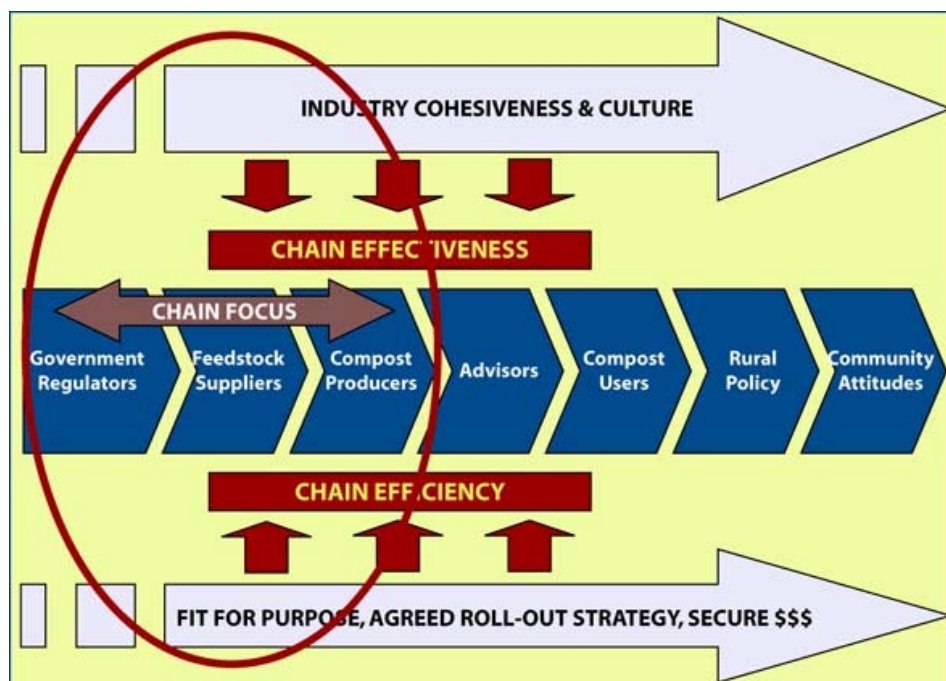
2. The Compost Industry Supply Chain

The compost industry in Australia comprises the following partnerships (see also Figure 2):

- State Agencies/Environmental Departments – these organizations establish the strategic framework within which feedstock suppliers operate. They also set the environmental standards which must be maintained by feedstock suppliers and compost producers.
- Local Councils – develop operational frameworks to carry out state policies.
- Compost Processors – compete (frequently very aggressively) for control of feedstocks within their respective geographical regions and manufacture different products.
- Advisors – comprising consultants, researchers, etc who work in the areas of policy, fiscal, market development and research.
- End-users – the final purchasers.
- Rural Policy Departments – establish programs to enhance agricultural sustainability. Programs of significance in Australia over the last 20 years include Landcare, catchment management committees and boards, and more recently the National Heritage Trust sustainability programs.

In a truly responsive supply chain, the “pull” influences “push” and so the demand and supply establish equilibrium. The tighter and more responsive the supply chain, the fewer “out-of-balance” periods occur.

Figure 2: The Compost Industry Supply Chain



Current focus of the chain is BACKWARDS LOOKING.

There is a need to EFFECTIVELY ENGAGE members further along the chain.

2.1 Chain Effectiveness and Efficiency

Within the supply chain, effectiveness will be improved through the development of an industry which works together to improve conditions along the entire supply chain. This requires a culture of inclusiveness, from which a workable plan can be developed.

Efficiency, on the other hand, will be improved through the industry implementing the agreed plan. However, an agreed plan will not go far unless it is adequately resourced and has well defined products focusing on target markets.

3. Roadblocks Facing the Australian Compost Industry

Five roadblocks facing the Australian compost industry were identified. These are:

1. Production is driving the system
2. Competition for feedstocks
3. Feedstock pricing policies
4. The compost markets
5. Product management

Each of these roadblocks is discussed below.

3.1 Production is Driving the System

In Australia, potentially recyclable organics (urban feedstock comprising green waste and bio-solids) are produced in large quantities in areas of high population density, while organic by-products (agricultural feedstock comprising feedlot, chicken, grape, pig, cotton and mushroom materials) is produced in large amounts in areas of intensive agriculture (see Figure 3). Therefore, capital cities produce the bulk of urban feedstock and some of the agricultural source material, with areas of intensive agriculture within a couple of hundred kilometres supplying the rest (see Figure 3 and Table 1).

Figure 3: Feedstock Distribution

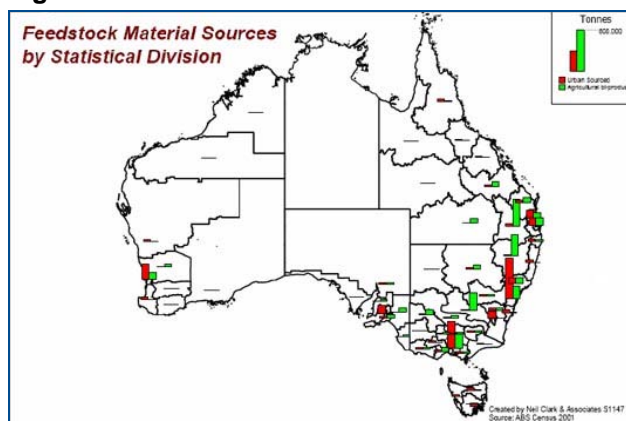


Table 1: Percent of organic material processed within the immediate environs of State capital cities (% of State Total)

	Urban	Agricultural
Sydney	63%	18%
Melbourne	72%	48%
Brisbane	48%	13%
Adelaide	73%	6%
Perth	73%	60%

Note: A4 Sized maps are available from Compost Australia (www.compostaustralia.com)

The focus of the compost strategies and policies to date has, by and large, been the urban market. This focus has served the industry well whilst supply matched demand. However, supply is now increasing faster than urban demand can utilize the products and the need to incorporate all feedstock sources, both urban and rural, into the planning and decision-making processes has become more apparent.

Also, within each of these two broad feedstock sources there are different attitudes to composting.

- Recycled organics – mulched or composted before application
- Bio-solids – dried or composted before application
- Organic by-products – most feedlot and chicken manure applied raw

The differing legislative requirements for recycled organics or organic by-products also impact on how much processing is undertaken to meet market demands.

Over the last decade as public antagonism to landfills or landfill prices has risen and populations increased, the supply of urban organics increased significantly (see Table 2). Considering the diversion targets that many policy makers have in place and the current rates of growth, the Australian compost industry will have to find a market for much more product in the coming years (Table 3).

Table 2: Current RO Diversion

State	Greenwaste diversion target	Typical Landfill Costs	Av increase in greenwaste diversion	Current diversion (5 yr est.)
SA	25% reduction in waste to landfill in 10 yrs	\$40/t	14.52% pa (1999 – mid 2004)	127,000 (250,148)
QLD	-	\$35/t	16.45% pa (mid 2001 – mid 2004)	391,416 (838,301)
VIC	75% diversion by 2013	\$32/t	9.08% pa (1993 – mid 2003)	216,882 (616,882)
NSW	66% diversion by 2014	\$67/t	24.55% pa (1996 – mid 2003)	550,000 (1,648,630)
Total				1,285,298 (3,353,961)

Note: Municipal waste targets are assumed to apply to green waste, except where individual jurisdictions have indicated otherwise.

Table 3: Projected RO Diversion

State	Most Recent Greenwaste Diversion (t/yr)	5 Year Projection	
		Minimum (t/yr)	Maximum (t/yr)
SA	127,000	130,207	250,148
QLD	391,416	434,277	838,301
VIC	216,882	226,732	616,882
NSW	550,000	569,521	1,648,630
WA	89,025	75,092	138,399

Note: Projections are based on population growth or historical trends in changes of diversion rate, except where individual jurisdictions provided their own projections.

3.2 Competition for Feedstock

For many compost manufacturers feedstock is an important source of income (through gate fees) and becomes a vigorously sought after resource. Such predatory behaviour, in conjunction with relatively low sales prices, has resulted in the process sector generally not having the funds to undertake adequate market development in new areas, so that supply can be utilised without prices dropping in real terms.

Therefore, much of the industry is in poor shape financially and there are insufficient funds to develop new markets, a process which is time consuming and costly.

The true costs of market development, especially new markets, are poorly accounted for. The source of funds for this market development is in dispute with no consensus between government departments (eg. the EPA's), local councils, compost manufacturers or other government agencies (eg. departments of agriculture, natural resource management agencies, environmental agencies etc). It is typical to hear compost processors saying that money for market development should come from government, with representatives of government contending that it should come from industry.

Feedstock uses other than compost

Whilst beyond the scope of this study, which is focused on the compost supply chain, it is none-the-less an important consideration for RO generators and policy makers at the state government level.

These increasing volumes diverted from landfill have to find a market. Perhaps the best parallel is with the Brazilian sugar industry: increased supply has driven the industry to look for other markets, such as

ethanol, which now consumes around 50 percent of all cane produced.

In the case of the RO industry, alternative uses such as energy production need clear consideration by the generators of the product to ensure that increasing volumes have a sustainable and profitable market. For example, if NSW and Victoria are to meet their landfill diversion targets, realistic market assessments need to be made and agreed to by both the state and local government authorities.

The difficulty in policy-driven supply which is generally associated with long contracts is that the holders of those long term contracts could be put at a disadvantage if the newer supply initiatives do not realistically take into account the market trends (perhaps best understood through finished product price trends and inventory trends within compost facilities).

The results of processes such as Life Cycle Assessment analysis can be used to assist in formulating policies that ensure "polluter pays, beneficial use" principles are applied to ROs.



3.3 Feedstock Pricing Policies

The market for compost is distorted because different feedstocks are priced differently:

Recycled organics, usually from urban areas, are treated as a market demanded product; however this is not strictly true when one considers the abundant supply. Since their prices are also subject to Local or State Government policy, this has resulted in a hybrid pricing system where the polluter pays part and the end-user pays part of the costs of the management of the product.

Bio-solids – the “polluter” pays most of the costs of disposal, i.e. bio-solid disposal is treated as an infrastructure issue – that is, the cost of management to the final site is considered as a cost of the production process. With bio-solid production, which is about half that of other recycled organics, there is a significant amount of subsidised material competing with ROs on the marketplace.

Agricultural by-products are treated as a raw material input source and end-users (compost manufacturers and farmers) are generally charged for the product. Table 4 indicates that selected sectors in agriculture produce about 3.6 million tonnes per annum – an amount which is virtually equal to the total urban production of compostable material. Diversion of this material away from immediate disposal or incorporation into the soil is significantly less than the other types of feedstock (estimated at less than 5%). Raw agricultural feedstock use is also permitted virtually unregulated, with no monitoring of heavy metals, pathogen content, run-off or other controls. The majority of the products included in Table 4 (perhaps with the exception of the majority of cotton gin trash) have

significant potential to compete in the same markets (or target markets) as other recycled organics. The nature of the competition and how the various feedstocks may develop complimentary uses therefore needs to be carefully considered.

Price – the major constraint

The low cost of landfill prices in most places has driven down the prices that composters can charge for their service. Council tendering processes are also considered to be mostly price-driven, with only a small premium allowable for the value that organics recycling represents. It is also felt that consumers would not tolerate higher rates for separate collection and/or composting systems. However, this view was disputed and some case-studies were presented at the workshops showed councils that had implemented green waste collection successfully without a resident backlash against higher charges.

Table 4: Agricultural Feedstock Production

Source	Feedstock	
	Volume (t)	Share (%)
Feed Lot	1,329,816	37%
Cotton	120,000	3%
Chickens - Egg	470,047	13%
Chickens - Meat	1,092,140	30%
Grapes	154,271	4%
Pigs – Sows	323,954	9%
Mushrooms	150,225	4%
Australian Total	3,640,453	100%

3.4 The Markets

The urban market is best understood by the recycled organics industry, but due to the supply push outlined above, it is now mostly saturated.

This market comprises two sub-segments:

- **Urban commercial** which includes landscapers, council amenity, nursery industry, public sporting arenas, etc.
- **Urban retail** which comprises the home garden market in either bulk or bagged form.

The agricultural market is least understood by the suppliers, is difficult to penetrate due to price, distance and the number of differing needs. Again, this market comprises two sub-segments:

- **Agricultural intensive** which includes fruit growers, vegetable growers, viticulturalists, ornamentals, turf, etc.
- **Agricultural extensive** which takes in the more profitable broad acre crops.

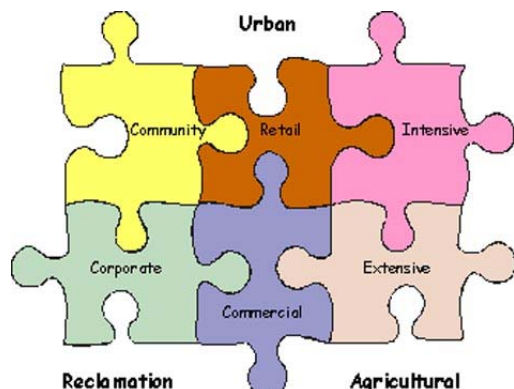
The reclamation market comprises catchments and mining reclamation works. In general, it has relatively few customers and, in the case of catchments and waterways, relies on public support (Local Government, National Heritage Trust funding etc) for the purchase of product. The sub-segments are:

- **Reclamation corporate** which applies to mine sites, rehabilitation, etc.
- **Reclamation community** which applies to catchment lands, etc.

Within the six broad market categories, current sales are dominated by the urban market. Within this market segment, the urban commercial is the dominant purchaser of compost products. This market is very price sensitive and reaching (or has reached in some situations) saturation. However customer needs of the less developed areas of the

urban commercial market (eg. golf courses, other recreational facilities) are less well understood and may well provide more useful market opportunities with more development work.

Figure 4: The Market Matrix



Depending on who you talk to, each segment could grow or shrink significantly in the future. There is little consensus about the realistic priorities for each market and what is the price which will result in significant movements in volume. However, because of supply outstripping demand, there is price pressure on compost and mulches within the major city centres of Sydney and Melbourne and others to a lesser extent.



The agricultural market

Within the compost industry, this market is seen by many as having the greatest potential for growth; however, because it is new, it is also the least understood by RO composters. As a consequence there are more “guesstimates” about what these markets may or may not achieve in the future. This is compounded by the uncertain implications of competitive products in these markets such as composted or uncomposted organic by-products (e.g., such as feedlot manures, chicken manure, etc). It is also a market that has the greatest number and most diverse range of customers. Finally, it is the one that, in most states, has the greatest transport distances to cover.

Within this general market segment, there are a number of sectors, each having different gross margins and therefore, differing propensity to pay. To assess the likely future markets, those sectors with the highest gross margins were mapped by statistical division. These sectors are fruit,

vegetables and viticulture. Whilst other sectors such as some broad acre crops may have potential, they were not considered as an initial priority for the RO industry focus. In each statistical division, the Estimated Value of Agricultural Operations (EVAO) was mapped and categorised into the following groups:

- Primary – Red, the top 50 percent of EVAO
- Secondary – Green, the next 30 percent of EVAO
- Tertiary – Yellow, the last 20 percent of EVAO

The number of dynamic enterprises or large commercial producers (LCPs), which are enterprises with an EVAO greater than \$500,000 (shown by the number within each statistical division on the map), were also mapped.

These data sets provide the basis for formulating both policy (for example, how to manage transport) and strategy (where should the marketing effort be targeted and in what form). Within the specific regions, government and industry can “drill” down further to obtain more detailed information on the specific features of each sector.

Sample outputs for the least attractive market (NSW, Figure 5) and the most attractive market (SA, Figure 6) are provided to illustrate the relationship to distance from markets (indicated by the concentric rings) in sectors that have a propensity to pay.

Figure 5: NSW Horticulture/Viticulture distribution

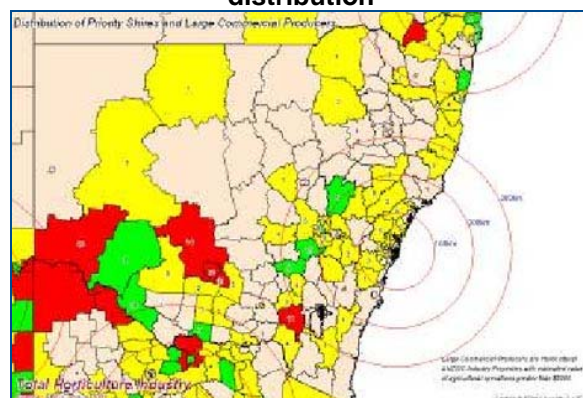
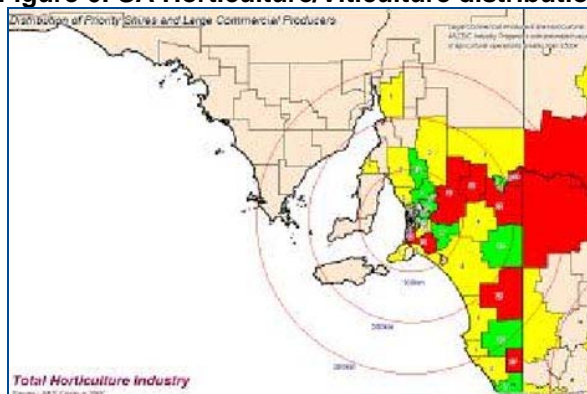


Figure 6: SA Horticulture/Viticulture distribution



The severity of the issue is illustrated in Table 5 that shows the concentration of statistical divisions where both high gross value of agricultural production and a large number of producers with annual values of production in excess of \$500,000 is highest.

Table 5: Feedstocks, Customers and Value

	Feedstock Source		Market Features	
	Urban t/y	Agricultural t/y	EVAO \$ (\$/t)	Large Bus. No. (t/business)
Sydney	1,608,975	511,606	109272856 (52)	45 (47124)
Brisbane	700,981	761,180	537919470 (368)	251 (5825)
Melbourne	1,075,873	584,915	873729554 (526)	429 (3871)
Adelaide	355,077	176,123	915673402 (1724)	341 (1558)
Perth	341,341	157,218	247130936 (496)	112 (4451)
Hobart	249,785	34,234	164159334 (578)	89 (3191)
Darwin	No data	No data	24197052	9
Canberra	146,058	0	No data	No data
Total	4,478,090	2,225,276	2872082604	1276

Notes:

1. Feedstock sources include all production within a 300km radius of the capital city.
2. Urban includes green by-products and biosolids. Agricultural is the total of all by-products produced within 300km of the capital.
3. EVAO – Estimated value of agricultural operations
4. Large businesses – those having gross revenue in excess of \$500,000
5. \$/t is \$ EVAO per tonne of total feedstock produced in the area. t/business is the total feedstock produce per large business in the area

South Australia and Victoria are the best states for penetration into horticulture and viticulture. By comparison, New South Wales is the least fortunate in having significantly fewer priority horticultural/viticultural regions within a 2-300 km radius Sydney. Within this radius, there are also fewer businesses which have a gross annual value of production in excess of \$500,000. In fact, if considering only high value agricultural operations as customers, per business, Sydney has about 30 times as much feedstock to find a market for, or 30 times less customer dollars available, than Adelaide!

Implications

The implications are that, with increased market awareness of the benefits of compost, customers are more likely to select the product which is most suitable for their business needs. This may well be a combination of both urban and agricultural feedstock material.

3.5 Product Management

Product knowledge

It was generally accepted that the process for selecting the right type of compost for each different set of conditions was not widely understood within the marketplace.

The benefits from the use of compost centred on three main areas: water retention, improvements to

soil/crop health and as a soil conditioner. As a result, partial replacement of conventional fertilisers was made difficult by compost processors offering a seemingly wide range of products and differences between mulches, composts, soil conditioners, etc were seen as confusing to the uninitiated.

The urban market

In the urban market there is not consensus from within the supply chain of either the market size or capability to grow.

As a result, there are no benchmarks for what volumes can realistically be absorbed per head of population. As diversion targets are established within State Governments, there is a corresponding need to establish and agree to urban reuse targets for all sectors of the community: State and Local Governments and the private sector.

Within a metropolitan city (eg. Sydney) the realistic assessment of market demand should be based on volumes sold per annum, average prices per annum and movements in stocks. At present demand is based on tendered volumes taken into compost yards. That is, demand is calculated on the volumes that composters are contracted to take rather than on what the market is paying for product. This approach fails to detect a slowdown in demand before it occurs as processors generally have long term contracts and are committed to taking product at a certain price. A newcomer to the market, recognising demand is reducing, may obtain a contract for a lower price. This situation reflects true demand responses. In other words, supply pressure is a function of both price and the size of stocks.

Future markets

Orderly product movement through the supply chain will only be achieved if the whole of supply chain has an agreed strategy for the next five years. This means:

- Transparent signals for supply production
- Closer “partnering” between feedstock suppliers and processors
- Closer “partnering” between processors and end-users by value chain
- Support for developing industry cohesiveness to roll-out an agreed strategy

It was felt there is a reasonable amount of scepticism regarding the value/benefits of compost. It is frequently sold as “more than fertiliser” but is this true? The disease suppression work shown on a number of crops with the research drawn from the US and Australia, is generally not known and the cost-benefit calculations have not been demonstrated within commercial operations here in Australia.

Product cost

The cost of the product is frequently seen as a constraint to wider uptake within the intensive agricultural sector, especially when the product has to be transported any significant distance from the supply source.

In some areas, there was a belief that cost would be less of an issue if the benefits of the product were better understood and able to be convincingly demonstrated.

Professional support

Given the wide-felt concern regarding lack of product understanding, the absence of supporting data is partly due to compost not being part of the public or private advice “menu”. That is, there are very few advisors who publicly advocate the benefits of compost. Whilst this is changing, advisors who are competent in their knowledge of compost across a range of intensive agricultural crops are few. At workshops there were always some specialists present who could point to substantial failures stemming from compost use that negated the potential attractiveness of the product.

Contamination

For some, contamination of product was an issue. In the cases cited it was primarily a visual issue, particularly where there are roadside applications or where the end product is marketed as coming from a “clean and green” environment (e.g., 140 year old vines). However, there were also health and safety issues raised and overseas experts considered this a major determinant in the successful uptake of the product, especially when future consumer aspirations were considered.

Quality

There is a general consensus that the processor’s view of quality does not necessarily match that of the end-user. The standards, quite rightly, focus on health and safety issues, but in order to meet end-user needs, it was felt that more appropriate specifications were needed.



4. Policy Issues

4.1 Policy Thrust

Although some action occurred on a national level a few years ago, recycled organics are now almost solely administered by the States. There is an overwhelming thrust towards zero waste with most state governments having policies that drive diversion away from landfill. **However, there is no strategy post-diversion.**

We see local councils attempting to accommodate this general policy focus and it usually has the support of the Local Government ratepayer base, but “who pays?” is a question that needs the consensus of the whole supply chain.

At the Local Government level there is pressure to be accountable to ratepayers and therefore, lowest cost is frequently a large determining factor in the supply chain management philosophy. It is difficult for Local Governments, seeking to dispose of recycled organics in a cost-effective manner to predict and support the costs of new market development. A number of Councils do make a concerted effort to include factors other than price in their tender evaluations. Factors such as a proven track record and a business and marketing plan are becoming more common requirements. However, other initiatives such as open book costing are yet to be considered by the majority of supply chain partners.

4.2 Effectiveness of Policy

Despite policy development and strategic targets established in the various state environmental protection agencies (or equivalent), fiscal instruments or regulations are the most influential in determining effectiveness of zero waste strategies. The most effective are:

- Landfill charges (including gate fees and state levies)

4.3 How does this Compare with Overseas Trends?

European compost legislation is being driven by recognition of the importance of soil as a non-renewable resource under pressure. Compost is seen as a method of improving soil quality with regulation used to protect human health.

Mandated separate collection of recycled organics is used as a preventative measure for minimising

Regulation of compost producers is driven by the need to prevent nuisance and harm to humans and the environment and focuses on process restrictions to ensure this outcome.

Product quality is assessed through the voluntary Australian Standard for compost (AS 4454). This standard concentrates on the protection of human health and the environment rather than specific customer requirements. It also specifies requirements for production methods (e.g., number of turns, temperature), labelling specifications and product quality requirements (e.g., organic matter content, physical contaminant level). Levels of chemical contaminants and pathogens are not specified, although applicants are required to meet current State or Federal Government guidelines (whichever is highest). Minimum nutrient levels are required if claims of plant nutrition are made.

The Biological Farmers Association also has an accreditation system for organic compost, which in terms of inputs into the process, contaminant levels and production methods, is more stringent than the Australian Standard.

- Limiting or putting increased imposts on landfill through legislation

For example, the highest rates of organic diversion in Australia are, in most cases, where the landfill prices are highest. Exceptions occur where diversion options (e.g., many large customers, incineration of green waste) are more freely available.

contamination while process control and product quality standards act as quality assurance in the protection of human health. This quality assurance also provides some certainty to the marketplace as a standardised and safe product.

The market is also driven by an overall policy goal of reducing waste disposal to landfill, which has led to

an increased supply of compostable material into the market place. The incineration of significant amounts of organic waste (a median of 15% up to about 50%) as an energy source also reduces the supply of green waste to the market.

The high level of investment into regulation and infrastructure has resulted in cheaper compost for the consumer and higher profit margins for manufacturers. Consequently, the larger waste management companies have a bigger presence in the industry.

4.4 Overseas Models Require Examination within the Australian Context

Within Europe, the compost industry has both state and federal drivers whilst in the United States, like Australia, the drivers are predominantly state based. This situation results in Australia and the US having a compost industry that has to compete ruthlessly for supply while at the same time developing markets outside of the urban areas. In the US, unlike Australia, there are extensive areas of intensive agriculture within close proximity to many of the major cities. Our physically diverse agricultural markets result in market development being more costly. This increases the probability that market penetration will be less than in the US or Europe because of the high transport costs.

The regulation of compost in the US is implemented by a mixture of state and federal regulations, voluntary standards and public procurement policies that have evolved separately. These standards are driven by either the protection of human health or the requirements of pre-determined markets (eg. public procurement policies).

Somewhat similarly to Australia, the ad-hoc nature of the industry in the US has led to less investment in infrastructure, lower profit margins and an industry with many more smaller players.

Table 6: US vs. UK Policy

US	UK
<ul style="list-style-type: none"> • Drivers – State environmental law, recycling targets 	<ul style="list-style-type: none"> • National & EU environmental law, recycling mandates
<ul style="list-style-type: none"> • Must compete with cost of landfilling 	<ul style="list-style-type: none"> • Taxing landfill gate fees to help recycling
<ul style="list-style-type: none"> • Slower development 	<ul style="list-style-type: none"> • Faster development
<ul style="list-style-type: none"> • Regulations are less intrusive 	<ul style="list-style-type: none"> • Regulations are more intrusive
<ul style="list-style-type: none"> • Product oriented 	<ul style="list-style-type: none"> • Process oriented
<ul style="list-style-type: none"> • Investment – less national funding <ul style="list-style-type: none"> ○ Infrastructure and market development (except biosolids) ○ Industry will take risk 	<ul style="list-style-type: none"> • Investment – more national funding <ul style="list-style-type: none"> ○ Infrastructure and market development ○ Industry is risk-adverse
<ul style="list-style-type: none"> • Influence – long term? <ul style="list-style-type: none"> ○ Large rubbish firms out ○ Size/number sites? ○ Market investment? 	<ul style="list-style-type: none"> • Influence – long term? <ul style="list-style-type: none"> ○ Large rubbish firms in ○ Size/number sites? ○ Market investment?

Source: Ron Alexander & Associates

4.5 Compost needs a place in Carbon-Based Agriculture

The development of an appropriate role for both government and R&D corporations in creating the demand and supporting the general roll-out of a more focused carbon-based program is seen as an

essential part of the overall sustainability agenda. To achieve this requires coordination at both the state and federal level.

4.6 Resource Credits

In Australia, green energy projects receive significant support from the Federal and State Governments. **However, carbon credits are not available if the organic material is diverted from landfill, processed and used as a soil conditioner.**

It is recognised that there are accounting difficulties with this approach, but the compost industry could make is a long term objective to meet the goal of assisting compost return to agricultural and other land uses. However, we do not need to have Kyoto style agreements – they can be agreements that meet the specific needs of an urbanised society living on the coast with large transport distances to the major food bowls.

There is a place for consideration of carbon credits attached to properly prepared compost. That is, compost produced through an accredited process that produces a high concentration of resilient humus like compounds. Assignment of these credits to end-users may be an attractive marketing case for the Federal Government, the end-user, the composter and the Local Government – a win for all.

However, this requires firm government commitment.

5. The Roadmap Strategies

The Roadmap is a result of the strategies and directions identified and developed by industry at workshops around Australia. To overcome the issues identified the following core strategies were suggested.

5.1 Core Strategies

1. Industry to influence

It was felt that a strong inclusive group capable of engaging all stakeholders be developed. This body needed to be aware of developments in public policy, research and education. It would be responsible for effective lobbying with one industry voice.

Compost should be linked with water efficiency and soil health improvements. Governments should be pushed towards a greater understanding of carbon based agriculture and soil needs. Compost should be linked with local activities and used to promote environmental awareness.

Governments should be encouraged to recognise the full and true costs of landfill, using appropriate environmental economic models. Disjoints in responsibility should be recognised and the concepts behind landfill should be clearly articulated within government policy at all levels to ensure the current ambiguities are reduced.

A funding model for the entire sector should be developed.

2. Marketing

A marketing campaign that focuses on changing perceptions and defining the industry is needed. Any

marketing must redefine compost outside of the waste stream, so it is a truly value added stream and can communicate value to customers and to councils. True value needs to be developed across each supply chain.

A standard or “fit-for-purpose” label needs to be developed to address end-user needs and promote the idea of different quality products. Quality assurance strategies need to be pursued to ensure compliance and quality products. A code of practice could be called for.

3. Education and research

Education is a critical element in all aspects of the chain and strategies for education within the sector and to external stakeholders need to be developed. An educational strategy for all aspects of the value chain is critical, including siting, planning, and management issues. A strategy is needed to eliminate odour management as a significant impediment to industry progress, reduce contamination and segregate feedstocks.

Research is a critical success factor that needs to be promoted strategically to back up education and awareness programs.

5.2 Three Primary Actions

1. Drive the process

- a) Develop a peak body to be representative of the supply chain and empower it with adequate funding.
- b) Develop a business plan for the body.
- c) Develop a marketing strategy for the body and for the products based on solid research results and good quality information.

2. Ensuring the product matches expectations – every time

- a) Under the body’s wing, develop standards, protocols and certification systems that will mirror end-user needs and create confidence in the product.
- b) Consider that QA is vital and collect & collate all the information together so it can be accessed by all players. A “Seal-of-Approval” and quality assurance program should be used as marketing tools.

- c) Co-ordinate the research that is necessary to develop quality products.

3. Build the case for wanting to use

- a) Develop education toolkits based on the accumulated research for all markets and promote them across the industry. Develop education programs internally and develop education programs for the public to help prevent contamination of product.
- b) Use Landcare and other outreach programs to educate about RO.
- c) Carry out demonstrations and action learning schemes. Demonstrate new technologies.
- d) Tap into the carbon market to see if there are opportunities under Green House Gas programs, etc.

5.3 Critical Success Factors

The final success of the Roadmap will, as always, be on the follow through. For this to happen, the compost processing sector must be the driver. The critical success factors we see are:

- Having a core group of committed “drivers” within the compost processing sector.
- Having this group adequately resourced to proceed with the implementation of the core strategies outlined above (it is in the best interests of the entire supply chain if this group is adequately resourced as it is in their interests

- to ensure volumes of product are moved at sustainable prices).
- Having a workable plan (not attempting too much too quickly).

It must be remembered that there is no “rocket science” or “magic bullets”. Rather, a commitment to a process that is achievable, has clear goals and is adequately resourced is far more important than lofty and intangible dreams.

Table 7: Key roadmap strategies

Needs	Strategies	Outcomes
A unified industry	<ul style="list-style-type: none"> • Co-ordinate activities and communicate results • Internal education programs on the state of the knowledge in compost 	An industry that grows the market rather than competes for supply.
A stronger voice in policy development	<ul style="list-style-type: none"> • Compost Australia to build partnerships with Federal, State and Local policy makers 	Policy makers that understand the needs of the compost industry
Secure funding	<ul style="list-style-type: none"> • Develop a business plan for Compost Australia. • Build partnerships with credible natural resource management, agricultural, environmental and governmental organisations 	An industry that is able to focus on market development
Increased market development	<ul style="list-style-type: none"> • Develop a business plan for Compost Australia 	Sustainable markets for Australian compost
Better understood products	<ul style="list-style-type: none"> • Develop educational toolkits for different market segments 	Greater uptake in all market segments
Better quality products	<ul style="list-style-type: none"> • Develop product specifications and certification systems that mirror end-user requirements in different market segments. • Develop a “seal of approval” program for producers meeting these requirements 	Customers with confidence in compost products nation-wide
More relevant and co-ordinated research	<ul style="list-style-type: none"> • Research to be coordinated by a national working group with representatives from each state, the public and private sectors. 	Products that are better understood and trusted
A marketing strategy	<ul style="list-style-type: none"> • Educational programs for the public on the benefits of compost. • Public demonstrations and trials of the benefits of compost 	Better awareness of the benefits of compost and a sustainable market for compost.



6. The First Miles

Following the Conference Series, two further workshops were held. These comprised:

1. Policy stakeholders and Compost Australia representatives
2. Key research, development and extension (RDE) people from around the country

The outcomes of these two workshops are summarised below and provide a wonderful framework for progressing the Roadmap.

6.1 Coordinating the Progress

Good communication between states is needed to ensure that funding is utilised efficiently and that work is not duplicated. Therefore, in addition to the national network of state-based Compost Australia Working

Groups, it was recommended a working group be formed that includes:

- Three processors to be nominated by Compost Australia membership;
- Three policy/regulatory representatives to be approved by the national network of Compost Australia Working Groups;
- Three Local Government representatives; and
- One Federal Government representative.

The purpose of this group is to co-ordinate the implementation of the roadmap between the states, exchange information and to ensure that activities do not overlap. State-based activities are currently geared towards their specific needs and it is envisaged that individual states will take the lead in issues of particular relevance to them. These states would then exchange the results of their efforts and information with the rest of the country with Compost Australia as the repository of all information. This central repository would then form the basis of most communication activities.

6.2 The Framework

Roadmap vision

Preliminary vision and goals have been developed

“To have all organics appropriately processed and used.”

An industry goal underlying this vision was also established:

“To increase demand for quality composted products”.

- To widely communicate clear direction/good practice.
- To widely communicate/influence so as to integrate Roadmap objectives into government policies and have the Roadmap recognised/considered in the formulation and implementation of policies.
- To formulate and prioritise recommended policies and actions to advance common programs.

THE NATIONAL BODY

Roles/objectives

- To ensure the Roadmap strategies are implemented (get agreement of how programs complement the Roadmap and share responsibilities for implementation of Roadmap program elements).
- Co-ordinate funding to prevent duplication/waste and share costs and outcomes of program implementation.
- Build good working relationships between composters, State, Local and Federal Government agencies.
- To ‘lever’ funds – add value to proposals/programs by allowing buy-in from other agencies/states

Priority areas /scope for coordination & cooperation

1. Certification/accreditation program for products and processors. NB: Victoria to take lead here through Compost Victoria and EcoRecycle Victoria – state program to consult nationally with a view to other states adopting program developed for Victorian industry.
2. Contamination management guidelines/code of practice – existing and draft Victoria guidelines to be used (SA to take lead).
3. Marketing and communication program – NSW trial and communication work, Qld EcoBiz program, Vic EcoBuy and market

development programs. Potential for shared information resources and shared national media. (NSW to take lead)

4. Growing markets for products
 - Share science/field trial results
 - Share experiences and tools in local marketing

- Find high profile national, state and local 'champions' for compost

5. Research, development and extension programs – share approaches, tools and outcomes. Use peer review for proposed programs/projects.

6.3 Research Development and Extension

Key areas for research

1. Roadshows/knowledge

- Undertake national roadshows to increase consumer awareness and understanding of composted products.

2. Grower demonstration groups

- Identify leading growers within each potential key market and region
- Establish a number of compost demonstration sites in cooperation with these growers
- Develop grower groups around these sites to increase grower awareness of composts
- Organize regular field days on sites showing clear benefits from compost use

3. Compile existing information on the beneficial characteristics and key attributes of compost

- Develop information packages which could be used to market compost
- Identify information gaps and use this to inform where research should be undertaken

4. Product quality specifications

- Improve product quality and consistency, in particular to manage and reduce contamination
- Tailor products to suit customer needs
- Relate products to existing Australian Standards

5. Research and development trials

- Undertake research aimed at quantifying the effects of compost on:
 - Nutrient mineralisation in soil (particularly nitrogen and phosphorus)
 - Water conservation and irrigation management
 - Reducing the impacts of pests, diseases and weeds.
- Undertake research into improving ability to predict compost maturity

6. Market analysis

- Identify the needs of potential consumers
- Establish partnerships between suppliers/producers and consumers to ensure products satisfy customer requirements

7. Barriers

- Understand the key barriers to establishing markets
- Develop strategies for overcoming these barriers

8. Understand soils and farming systems

- Quantify benefits of composts on soil health (including soil physical, chemical and biological characteristics) and individual components of the farming system
- Integrate these benefits to demonstrate how composts can be used to improve the farming system as a whole

9. Infrastructure

- Improve the infrastructure/supply chain associated with processing, transporting and spreading composts

10. Educate more advisors

- Tap into existing advisory networks, such as farm consultants, government agronomists/extension officers, fertiliser company representatives.
- Improve their awareness/understanding of composts
- Facilitate the promotion of composts through these networks

11. Support distribution channels with appropriate remuneration

- Define who will distribute composts and identify whether they have the capacity to deliver compost to market

12. Identify long-term cost benefits

- Undertake research into quantifying the long-term cost benefits to growers from using composts.
- Ensure competing products are also included in any cost-benefit studies

13. Professional development for stakeholders/ industry capacity building

- Establish programs for on-going professional development for people involved in the compost industry, particularly processors and advisors. (i.e. capacity building)
- Ensuring cost-effective business operation are sustained (benchmarking etc)

14. Establish linkages between agriculture and the broader community

- Improve community understanding of where their food comes from, particularly with respect to the “food bowls” around metropolitan areas
- Create partnerships with the community with respect to managing organic waste streams and “closing the loop” between organic matter and nutrients exported from farms to urban “sinks”

The above RDE was summarised into 4 programs outlined in Table 8.

Table 8: RDE Programs

Program	Objective
1 Building End-User Capacity	To improve the knowledge and capacity of customers in order for them to sustainably increase their use of composted products
2 Product Development	To produce and deliver products which enable customers to purchase with confidence
3 Sustainable Farming Systems Research	To promote research and development that establishes a more robust understanding of the soils and better quantifies the long-term benefits
4 Building Processor & Distribution Capacity	To improve logistical and HR capacity within the compost supply chain



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