

Australian Organics Recycling Industry Capacity Assessment: 2022-23



A E A S

Australian Economic
Advocacy Solutions

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REPORT PREPARATION

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Executive Summary

Australian Economic Advocacy Solutions (AEAS) was commissioned by AORA (Australian Organics Recycling Association) to determine the existing and potential capacity and capability of the Australian Organics Recycling Industry (AORI) to meet recycling benchmarks that could be driven by improved policy settings.

Recycled organics can be defined as a generic term for a range of products manufactured from compostable organic materials (garden organics, food organics, residual wood and timber, biosolids and agricultural organics). There are essentially two distinct but related markets in the organics supply chain: the service market for waste stream removal and processing and the product market for compost.

Figure 1: Organic Markets

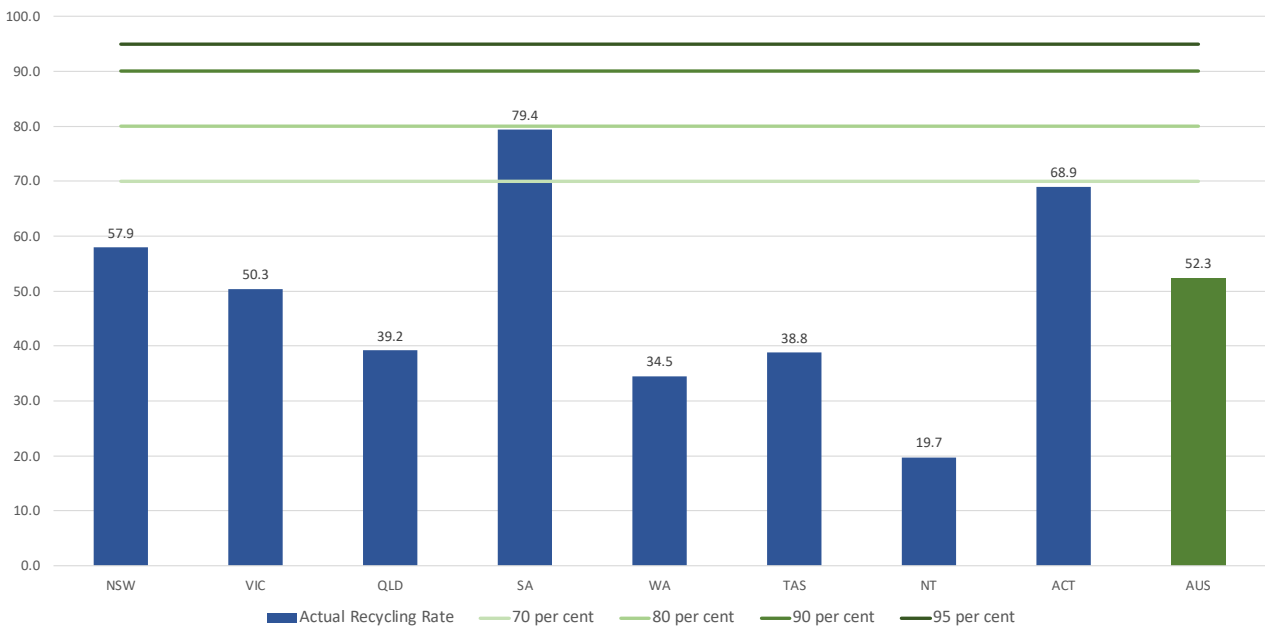


Source: AEAS

Each year the organics recycling industry is processing 7.7 million tonnes of waste to produce valuable product for further use across the Australian economy. Diverting organic resources for recycling, significantly reduces emissions and recovers valuable nutrients from being landfilled that improves sustainability and provides benefit to our community. Organics recycling closes the loop on food and other organic wastes and ultimately returns them to production through the soil or other value-added inputs to our economy. It is an exemplar of the “circular economy”.

In performing these commendable tasks for the environment, the Australian Organics Recycling Industry is also providing an enormous economic benefit to everyday Australians. Last year AORA released ‘The Economic Contribution of the Australian Organics Recycling Industry’ that revealed the considerable macroeconomic contribution the industry is making - providing over 5,032 jobs, \$386 million in wages and salaries, \$1.9 billion in supply chain opportunities and \$781 million in industry direct value add to the Australian economy.

Figure 2: Organic material recycling rates in 2021-22 and potential targets



Source: National Waste Report, AEAS

AEAS as part of the 'The Economic Contribution of the Australian Organics Recycling Industry' report modelled what the economic and environmental contribution of the organics recycling industry would be if the current organics recycling rates were increased under four different scenarios - to at least 70 per cent, 80 per cent, 90 per cent and 95 per cent. Under the 95 per cent scenario:

- Organics recycling businesses would generate an extra \$1.7 billion in sales providing an additional \$1.6 billion in supply chain opportunity with an extra \$636 million in industry value add towards the Australian economy;
- Organics recycling businesses would provide 4,101 extra jobs paying \$314 million in livelihood to everyday Australians; and
- An extra 3,186,401 tonnes of greenhouse gas emissions would be saved which is equivalent to 4,764,649 trees planted; and 736,441 cars taken off the road each year.

Table 1 : Economic Gain – Australia (\$ millions)

	Employment at end of June (FTE)	Wages and salaries	Sales	Expenditure	Capital expenditure	Operating profit before tax	Industry value added
No change	-	-	-	-	-	-	-
70%	1,797	138	752	684	56	116	279
80%	2,662	204	1,114	1,014	82	172	413
90%	3,623	278	1,516	1,380	112	234	562
95%	4,101	314	1,716	1,562	127	265	636

However, this enormous economic and environmental benefit is not only contingent upon the right policy settings but also the industry's capacity and capability to take up the opportunity. To achieve a 95 per cent recycling rate the industry would need to increase its processing by 6.3 million tonnes (from its current 7.74 million tonnes) to 14.05 million tonnes each year.

Table 2: Current and needed Organic Material Recycled (tonnes) to achieve Notional Recycling Rates

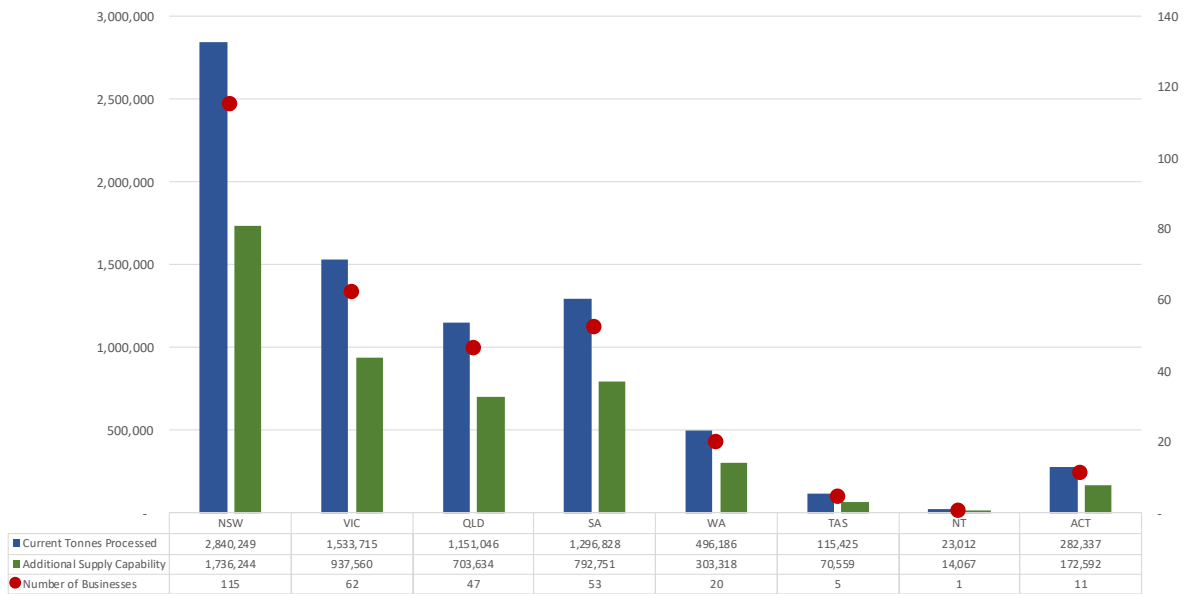
	Current	70%	80%	90%	95%
NSW	2,840,249	3,434,492	3,925,134	4,415,776	4,661,097
VIC	1,533,715	2,135,489	2,440,559	2,745,628	2,898,163
QLD	1,151,046	2,055,168	2,348,764	2,642,359	2,789,157
SA	1,296,828	1,144,018	1,307,449	1,470,880	1,552,596
WA	496,186	1,005,794	1,149,479	1,293,164	1,365,006
TAS	115,425	208,479	238,261	268,044	282,935
NT	23,012	81,787	93,471	105,155	110,997
ACT	282,337	286,692	327,648	368,604	389,082
AUS	7,738,799	10,351,919	11,830,765	13,309,610	14,049,033

Source: AEAS

A key finding of the AORA Organic Material Recycling Capability Survey 2023, commissioned as part of this report, is that the industry is capable of processing an additional 61.1 per cent of organic materials (or 4.73 million of collective processing capacity each year) given the physical capacity of their existing operations. Based on this modelling:

- Only South Australia and the ACT are capable of meeting the required capacity for each of the 70 per cent, 80 per cent, 90 per cent and 95 per cent recycling rates;
- NSW is capable of meeting required capacity for a 90 per cent recycling rate but is not positioned to meet a 95 per cent recycling rate;
- Victoria is capable of meeting a 80 per cent recycling rate but not 90 per cent and 95 per cent recycling rates; and
- All other States and Territories have shortfalls for meeting required capacity for 70 per cent, 80 per cent, 90 per cent and 95 per cent recycling rates.

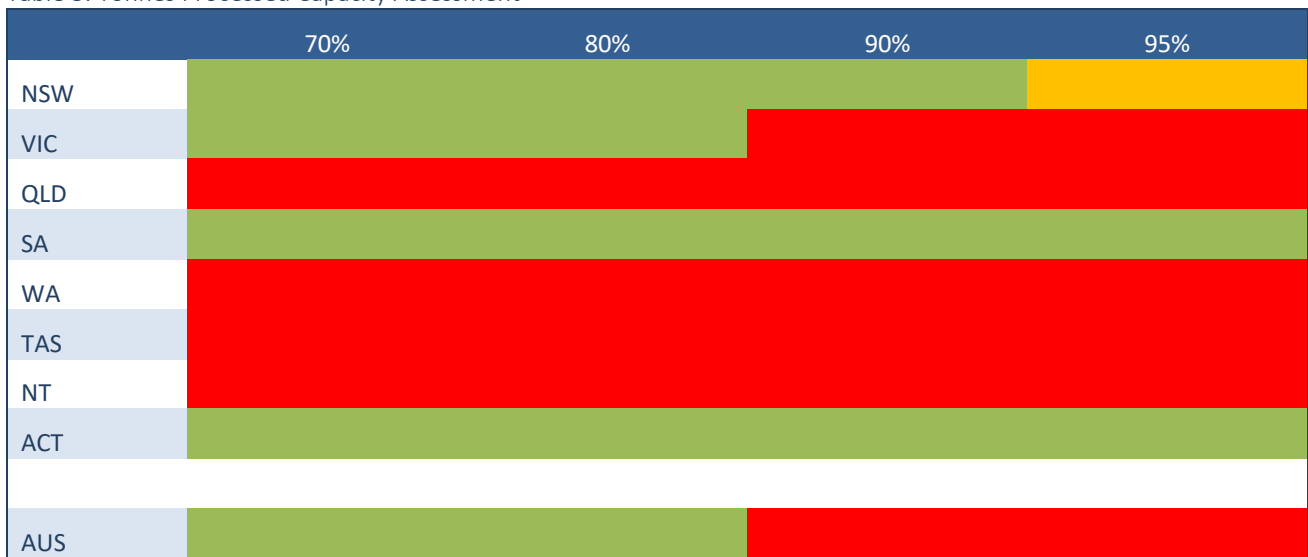
Figure 3: Current Tonnes Processed and Additional Supply Capacity by State 2022-23



Source: AEAS

AEAS in Table 3 has prepared a traffic light report for each state’s ability to provide the necessary processing capability to meet the respective state’s recycling rate. Given that shortfalls in processing capacity exist, this report confirms both **growth for the existing industry** and **room for new businesses**.

Table 3: Tonnes Processed Capacity Assessment



Source: AEAS

Legend
Capacity is sufficient to meet target
Capacity is just short of target
Capacity is insufficient to meet target

On the basis of the above there will be a requirement to either create new capacity among existing industry or promote new industry participants once existing capacity is exhausted. This will particularly be the case for organic material recycling in most rural and regional areas, where there is currently little or no way to deal with organic waste but to landfill it due to low capacity and infrastructure.

In addition, the industry believes it is able to increase by 69.5 per cent the total tonnes of products sold given market demand which is equivalent to an additional 5.0 million tonnes of compost and non-compost product sales each year. Based on the existing and additional potential sales capacity there is approximately 2.6million tonnes of excess market demand available to achieve an Australian recycling rate of 70 per cent and 1.2 million excess market demand available to achieve an Australian recycling rate of 80 per cent.

However the market then transitions to having insufficient demand for organic recycling products to meet the 90 per cent (179,056 tonnes shortfall) and 95 per cent recycling rate (867,384 tonnes shortfall).

AEAS modelling indicates that for Queensland, Western Australia, Tasmania and the Northern Territory, new market demand for organic recycled products will need to be established for these States to meet the 70 per cent, 80 per cent, 90 per cent and 95 per cent recycling rates.

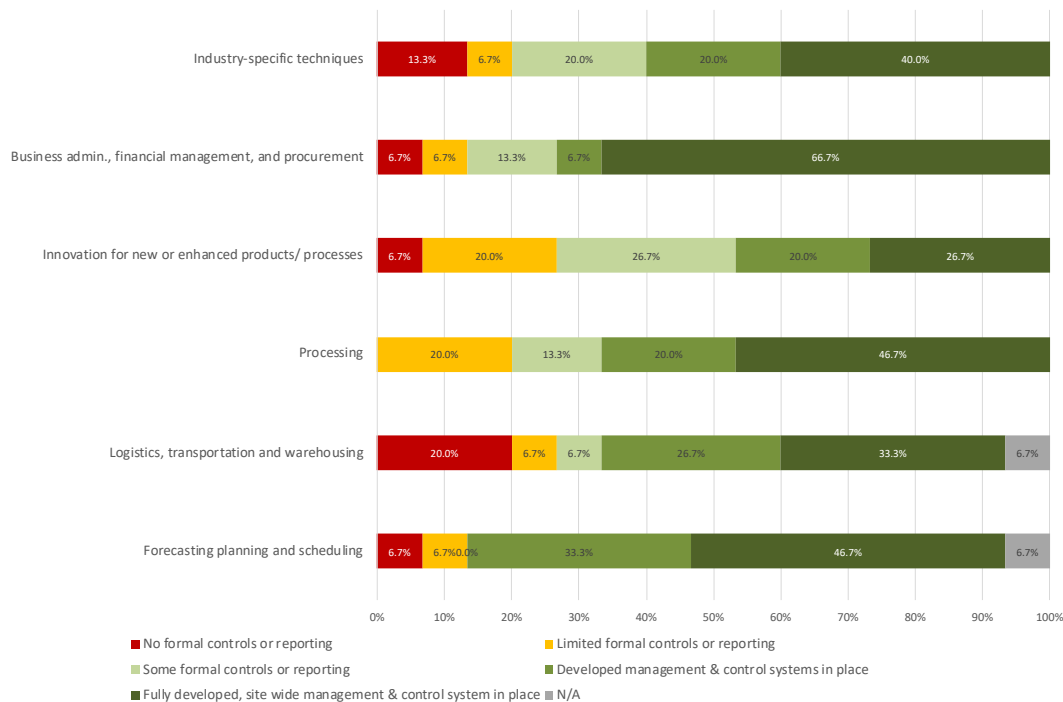
In respect to industry capability (the skills, processes and knowledge to meet an increase in the processing of organic materials and the supply of recycled organic material products) there is considerable existing capability available to lift organic material recycling rates.

Operational issues such as access to technology, labour costs, logistics etc are considered to be very minor obstacles to growth at present and indicate that the industry’s constraints are less internal and more externally focused. For example based on the Survey the largest obstacles to the operation and growth of the industry at present include:

- regulatory policy uncertainty;
- contamination of input material;
- government policy (eg waste and recycling strategy);
- business licensing and operating permits;
- development applications;
- government procurement supporting organic recycling products; and
- short council contract periods.

The report also confirms that organic recycling industry businesses are comfortable with managing growth. Organic recycling businesses have indicated relatively good growth in their business over the last three years and expectations are for further growth. Industry satisfaction with its performance appears quite good with four in five businesses indicating they are somewhat, mostly or very satisfied with their overall performance and other key performance indicators. Areas for improvement are in higher profit rates through lower costs of production. The industry's current stage of development for a range of core business functions appears to be very mature indicating strong readiness to seize opportunities.

Figure 4: Industry Maturity 2022-23



Source: AEAS

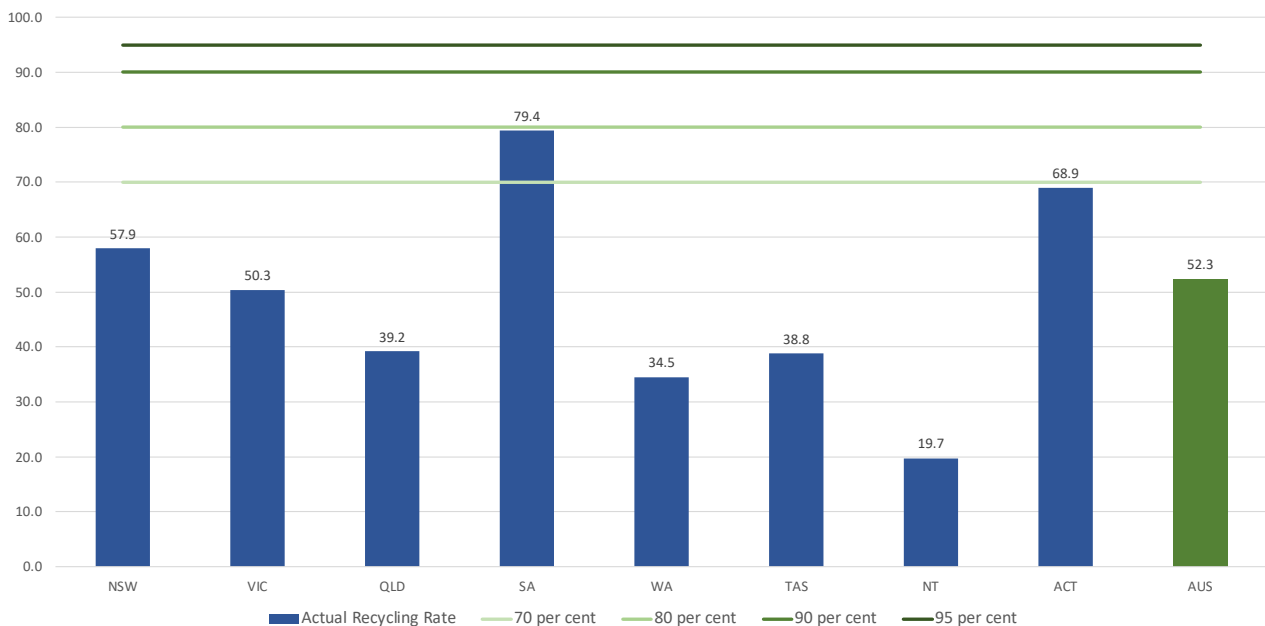
In summary the industry is assessed as having good capability and supply capacity to deliver an improvement in Australia’s organic material recycling rate. However, there will need to be end market development in some States to ensure buyers are available to realise the benefit of recycled organic material products.

This AEAS report provides analysis that is specific to the unique capabilities of the organics recycling industry by State and provides an understanding of industry capacity trends that will in turn act as a foundation of increased recycling, economic and environmental benefit through the further development of the Australian organics recycling industry. The report provides independent and robust assessment of the industry’s ability to step up as an economic, employment and environment provider of benefit.

2.0 Methodology

- 2.1 AEAS was commissioned by AORA (Australian Organics Recycling Association) to determine the existing and potential capacity and capability of the Australian Organics Recycling Industry (AORI) to meet an improvement in the Australia’s organic material recycling rate. The report was developed in consultation with AORA and identifies a range of vital statistics that the industry is able to provide in lifting Australia’s organic material recycling rate and builds on its 2020-21 Capability Assessment.
- 2.2 AEAS as part of the report has analysed both the capacity and capability of the existing Australian Organic Recycling industry to both realise and activate an improvement in the organics recycling rate to 70 per cent, 80 per cent, 90 per cent and 95 per cent. Capacity is referred to as the physical resourcing and ability and capability is referred to the skills, processes and knowledge. This analysis is designed to assist AORA advocacy to implement policies across Australian states that lead to improved recycling of organic material.

Figure 5: Organic material recycling rates in 2021-22 and targets



Source: National Waste Report, AEAS

- 2.3 More specifically this report analyses the following:
- An overview of current recycling rates and tonnes processed and modelled tonnes needed to achieve a 70, 80, 90 and 95 percent recycling rate of organics material;
 - Profile the capabilities of existing organic recycling businesses by state including product / service range; expertise and skill levels and key areas of strengths and weaknesses, opportunities and threats within the organics recycling industry;
 - A quantitative estimation of current and future capacity (in tonnes) of the organic recycling industry by state including capacity for storage of materials and products;
 - Identification of soft and hard infrastructure required to underpin and potential gaps for future growth of the organics recycling sector; and
 - Quantitative analysis of emerging markets or current market gaps for an expanded industry.
- 2.4 The capacity and capability estimates in this report are produced using data primarily from an AORA Capability Survey 2020 (see appendix two); Australian Bureau of Statistics - Australian Industry (Cat. No. 8155.0); National waste report; and other Australian Bureau of Statistics data including Census data and ABS Catalogues 6202.0 and 5220.0.
- 2.5 Respondents to the survey processed 1.1 million tonnes of organic material each year representing 15.0 per cent of material processed in Australia each year. The survey was conducted across September and October 2020.
- 2.6 All estimates are presented in nominal terms (i.e. current prices in the year received), unless otherwise stated.

3.0 Benefits of Australian Organics Recycling Industry

In early 2020 AEAS, in its report ‘The Economic Contribution of the Australian Organics Recycling Industry’, modelled the economic and environment benefits of the Industry to Australia. A summary of these benefits is provided below. The AEAS Report is available at the AORA website (www.aora.org.au)

3.1 Benefits to the Economy

The AORI is an important contributor to the Australian economy. Results of a macro-economic analysis of the industry reveal it is providing 5,032 jobs to Australian residents, paying over a \$386 million in wages and salaries; providing a livelihood to each employee within the industry of \$76,710; has a collective industry turnover of over \$2.1 billion; sourcing \$1.9 billion across its supply chain, investing \$156 million in land, buildings, plant and equipment and vehicles each year and contributing \$781million in industry value add to the Australian economy. A summary of the State breakdown of AORI’s economic contribution metrics is provided in table 4 below.

Table 4: Economic contribution by State in 2021-22 (\$ millions)

	Employment at end of June	Wages and salaries	Sales	Expenditure	Capital expenditure	Operating profit before tax	Industry value added
NSW	1,847	142	773	703	57	119	287
VIC	997	76	417	380	31	64	155
QLD	748	57	313	285	23	48	116
SA	843	65	353	321	26	54	131
WA	323	25	135	123	10	21	50
TAS	75	6	31	29	2	5	12
NT	15	1	6	6	0	1	2
ACT	184	14	77	70	6	12	28
AUS	5,032	386	2,105	1,916	156	325	781

Source: AEAS

Table 5: Key Economic Benefits of the Australian Organics Recycling Industry

Direct Economic Benefit	Indirect Economic Benefit
<ul style="list-style-type: none"> ▪ 314 businesses operating; ▪ Providing 5,032 jobs to Australian residents; ▪ Pays over a \$386 million in wages and salaries and an additional \$40.5 million towards employee superannuation; ▪ Provides an average livelihood to each employee within the industry of \$76,710 which compares to Australian average weekly earnings of \$69,103; ▪ Has a collective industry turnover of over \$2.1 billion; ▪ Sources and provides \$1.9 billion in benefit across its supply chain; ▪ Invests \$156 million in land, buildings, plant and equipment and vehicles each year; and ▪ Contributes \$781 million in industry value add to the Australian economy. 	<ul style="list-style-type: none"> ▪ \$624 million in industry value add to GDP through flow-on demand for goods and services, including production induced and consumption induced effects; and ▪ 4,227 indirect jobs provided through flow on activity. <p>Other key economic statistics include:</p> <ul style="list-style-type: none"> ▪ One job is supported for every 1,538 tonnes of organic material recycled in Australia; ▪ The average sales per organics recycling business is \$6.7 million. Expressed alternatively total AORI turnover is estimated at \$272 per tonne of recycled organic material; and ▪ Supply chain expenditure is estimated at \$248 per tonne of recycled organic material.

Source: AEAS

3.2 Benefits to the Environment

Organics recycling reduces Greenhouse Gas (GHG) emissions primarily by decreasing the amount of energy, particularly fossil fuels, used by industry to make products compared with using virgin raw materials. It also reduces emissions of greenhouse gases by diverting recovered materials from landfills which biologically decompose in landfills and generate methane.

Australian organics recycling industry compost products in particular help the environment by:

- Building soil carbon in agricultural soils. One tonne of composted garden organics applied to land can sequester approximately 0.5 tonnes of CO₂e (equivalent);
- Creating healthy soils that use less water, less fertiliser and fewer pesticides whilst reducing nutrient leaching and protecting the aquatic environment;
- Supporting resilient farming systems producing healthy food and supporting Australia’s food security; and
- Buffering the effects of climate change in agriculture by:
 - reducing water loss from soils (improving water use efficiency and reducing cropping risk);
 - protecting soils against wind and water erosion;
 - reducing soil temperature fluctuations (increasing root growth and soil biology); and
 - reduces synthetic fertilizer demand and carbon emissions from fertilizer manufacture and use.

Mulch application suppresses weed growth and can save more than 30 per cent of irrigation water depending on conditions. The composting process destroys weed seeds and pathogens, helping to control the spread of weeds and diseases as well as managing biosecurity risks.

The AEAS Report concluded that the total estimated greenhouse gas savings from organics recycling of materials received in Australian in 2021-22 is approximately 3.9 million tonnes of CO₂-e. These GHG savings are considered approximately equivalent to:

- Approximately 5.8 million trees that would have to be planted to absorb the same amount of CO₂.
- The greenhouse gas emissions that 902,311 cars would produce in a year.

The environmental benefits by State are provided in table 6 below.

Table 6: Australian Organics Recycling Industry - Environmental Benefits Summary 2021-22

	GHG emissions saved (tonnes)	Equivalent trees planted required for carbon absorption	Equivalent cars off the road each year
NSW	1,434,205	2,143,777	331,161
VIC	774,461	1,157,625	178,825
QLD	581,229	868,792	134,207
SA	654,843	978,826	151,205
WA	250,553	374,513	57,853
TAS	58,285	87,121	13,458
NT	11,620	17,369	2,683
ACT	142,568	213,104	32,919
AUS	3,907,764	5,841,127	902,311

Source: AEAS

4.0. Benefits of Increasing Organic Material Recycling

As impressive as the benefits listed in section 3 are, they represent only a fraction of what the Australian Organics Recycling Industry (AORI) is capable of achieving. AEAS as part of the 'Economic Contribution of the Australian Organics Recycling Industry' report modelled what the economic and environmental contribution of the industry would be if the current organics recycling rates were increased under four different scenarios - to at least 70 per cent, 80 per cent, 90 per cent and 95 per cent. A summary of the economic and environmental benefits under each scenario are below.

4.1 70 per cent recycling rate

Under a 70 per cent recycling rate:

- Organics recycling businesses would generate an extra \$752 million in sales providing an additional \$684 million in supply chain opportunity with an extra \$279 million in industry value add towards the Australian economy;
- Organics recycling businesses would provide 1,797 extra jobs paying \$138 million in livelihood to everyday Australians; and
- An extra 1,396,678 tonnes of greenhouse gas emissions saved which is equivalent to 2,089,014 trees planted; and 323,015 cars taken off the road each year.

4.2 80 per cent recycling rate

Under a 80 per cent recycling rate:

- Organics recycling businesses would generate an extra \$1.1 billion in sales providing an additional \$1 billion in supply chain opportunity with an extra \$413 million in industry value add towards the Australian economy;
- Organics recycling businesses would provide 2,662 extra jobs paying \$204 million in livelihood to everyday Australians; and
- An extra 2,066,269 tonnes of greenhouse gas emissions saved which is equivalent to 3,090,053 trees planted; and 477,691 cars taken off the road each year.

4.3 90 per cent recycling rate

Under a 90 per cent recycling rate:

- Organics recycling businesses would generate an extra \$1.5 billion in sales providing an additional \$1.4 billion in supply chain opportunity with an extra \$562 million in industry value add towards the Australian economy;
- Organics recycling businesses would provide 3,623 extra jobs paying \$278 million in livelihood to everyday Australians; and
- An extra 2,813,024 tonnes of greenhouse gas emissions saved which is equivalent to 4,206,451 trees planted; and 650,191 cars taken off the road each year.

4.4 95 per cent recycling rate

Under a 95 per cent recycling rate:

- Organics recycling businesses would generate an extra \$1.7 billion in sales providing an additional \$1.6 billion in supply chain opportunity with an extra \$636 million in industry value add towards the Australian economy;
- Organics recycling businesses would provide 4,101 extra jobs paying \$314 million in livelihood to everyday Australians; and
- An extra 3,186,401 tonnes of greenhouse gas emissions saved which is equivalent to 4,764,649 trees planted; and 736,441 cars taken off the road each year.

A full break down of both the economic and environmental benefits under each of the modelled improvements in recycling rates are provided in tables 7 to 10.

Table 7: Economic Contribution – Australia (\$ millions)

	Employment at end of June (FTE)	Wages and salaries	Sales	Expenditure	Capital expenditure	Operating profit before tax	Industry value added
No change	5,032	386	2,105	1,916	156	325	781
70%	6,829	523	2,857	2,601	211	441	1,060
80%	7,694	590	3,219	2,930	238	496	1,194
90%	8,655	663	3,621	3,296	268	558	1,343
95%	9,133	700	3,821	3,478	282	589	1,417

Source: AEAS

Table 8: Economic Gain – Australia (\$ millions)

	Employment at end of June (FTE)	Wages and salaries	Sales	Expenditure	Capital expenditure	Operating profit before tax	Industry value added
No change	-	-	-	-	-	-	-
70%	1,797	138	752	684	56	116	279
80%	2,662	204	1,114	1,014	82	172	413
90%	3,623	278	1,516	1,380	112	234	562
95%	4,101	314	1,716	1,562	127	265	636

Source: AEAS

Table 9: Environmental Contribution - Australia

	GHG emissions saved (tonnes)	Equivalent trees planted required for carbon absorption	Equivalent cars off the road each year
No change	3,907,764	5,841,127	902,311
70%	5,304,442	7,930,141	1,225,326
80%	5,974,033	8,931,180	1,380,002
90%	6,720,788	10,047,578	1,552,502
95%	7,094,165	10,605,776	1,638,752

Source: AEAS

Table 10: Environmental Gain - Australia

	GHG emissions saved (tonnes)	Equivalent trees planted required for carbon absorption	Equivalent cars off the road each year
No change	-	-	-
70%	1,396,678	2,089,014	323,015
80%	2,066,269	3,090,053	477,691
90%	2,813,024	4,206,451	650,191
95%	3,186,401	4,764,649	736,441

Source: AEAS

5.0. The Required Task

The considerable economic and environmental benefit that AORI is capable of providing is contingent upon both the right policy settings and also industry's capacity and capability to take up the opportunity. AORA has identified the necessary policy initiatives that the three tiers of Government across all Australian States should implement to address identified obstacles (see figure 14) and maximise the likelihood of AORI benefits being realised as consequence of a strategic improvement in organic material recycling rates. However, better policy is only part of the equation and industry also needs to be in a position to step up to increase both tonnes of organic material processed and sold. The required increase in both processing and sales is modelled below.

5.1 Tonnes Processed

Table 11 identifies the amount of organic material recycled to achieve the notional recycling rates. To achieve a 95 per cent recycling rate the industry would need to increase its processing by 6.3 million tonnes (from its current 7.74 million tonnes to 14.05 million tonnes) each year or by 81.5% each year.

Table 11: Current and needed Organic Material Recycled (tonnes) to achieve Notional Recycling Rate

	Current	70%	80%	90%	95%
NSW	2,840,249	3,434,492	3,925,134	4,415,776	4,661,097
VIC	1,533,715	2,135,489	2,440,559	2,745,628	2,898,163
QLD	1,151,046	2,055,168	2,348,764	2,642,359	2,789,157
SA	1,296,828	1,144,018	1,307,449	1,470,880	1,552,596
WA	496,186	1,005,794	1,149,479	1,293,164	1,365,006
TAS	115,425	208,479	238,261	268,044	282,935
NT	23,012	81,787	93,471	105,155	110,997
ACT	282,337	286,692	327,648	368,604	389,082
AUS	7,738,799	10,351,919	11,830,765	13,309,610	14,049,033

Source: AEAS

Table 12 indicates the actual additional tonnes required to achieve the corresponding recycling rate. Generally, as the target recycling rate increases the number of additional tonnes of organic material recycled increases. Queensland has the greatest required task ahead of it and reflects the State's current low recycling rate of 39.2 per cent (see figure 5). Conversely South Australia has the least amount of increase in tonnes needing to be processed reflective of its already high recycling rate of 79.4 per cent.

Table 12: Increase in Organic Material Recycled (tonnes)

	Current	70%	80%	90%	95%
NSW	-	594,243	1,084,885	1,575,527	1,820,848
VIC	-	601,774	906,843	1,211,913	1,364,448
QLD	-	904,122	1,197,718	1,491,313	1,638,111
SA	-	(152,811)	10,621	174,052	255,767
WA	-	509,608	653,293	796,978	868,820
TAS	-	93,054	122,836	152,619	167,510
NT	-	58,775	70,459	82,143	87,985
ACT	-	4,355	45,311	86,267	106,745
AUS	-	2,613,121	4,091,966	5,570,812	6,310,235

Source: AEAS

Table 13 provides the percentage increase in organic material processed to achieve the corresponding recycling rate. The highest percentage increases to achieve a 95 per cent recycling rate are for Queensland (142.3%) and Western Australia (175.1%) and the smallest increases are for South Australia (19.7%) and the ACT (37.8%).

Table 13: Percentage increase in Organic Material Recycled (%)

	Current	70%	80%	90%	95%
NSW	-	20.9%	38.2%	55.5%	64.1%
VIC	-	39.2%	59.1%	79.0%	89.0%
QLD	-	78.5%	104.1%	129.6%	142.3%
SA	-	-11.8%	0.8%	13.4%	19.7%
WA	-	102.7%	131.7%	160.6%	175.1%
TAS	-	80.6%	106.4%	132.2%	145.1%
NT	-	255.4%	306.2%	357.0%	382.3%
ACT	-	1.5%	16.0%	30.6%	37.8%
AUS	-	33.8%	52.9%	72.0%	81.5%

Source: AEAS

5.2 Tonnes Sold

Not only is the realisation of the potential economic and environment benefits of improved recycling rates contingent upon the industry's capacity to lift its tonnes of recycled organic material processed but also its ability to sell its products to the market. Table 14 and 15 identify the increase in organic material needed to be sold to achieve the notional recycling rates. For example to achieve a 95 per cent recycling rate the industry would need to increase the amount of product sold by 5.9 million tonnes (from its current 7.2 million tonnes to 13.1 million tonnes).

Table 14: Current and needed tonnes of Organic Recycled Material Sold to achieve Notional Recycling Rate

	Current	70%	80%	90%	95%
NSW	2,643,988	3,197,169	3,653,907	4,110,646	4,339,015
VIC	1,427,736	1,987,927	2,271,916	2,555,906	2,697,900
QLD	1,071,509	1,913,156	2,186,464	2,459,772	2,596,426
SA	1,207,218	1,064,966	1,217,104	1,369,242	1,445,311
WA	461,899	936,294	1,070,050	1,203,806	1,270,684
TAS	107,449	194,073	221,797	249,522	263,384
NT	21,422	76,136	87,012	97,889	103,327
ACT	262,827	266,882	305,008	343,134	362,197
AUS	7,204,048	9,636,602	11,013,259	12,389,916	13,078,245

Source: AEAS

Table 15: Increase in Organic Material Recycled (tonnes)

	Current	70%	80%	90%	95%
NSW	-	553,181	1,009,919	1,466,658	1,695,027
VIC	-	560,191	844,180	1,128,170	1,270,165
QLD	-	841,647	1,114,955	1,388,263	1,524,918
SA	-	(142,251)	9,887	162,025	238,094
WA	-	474,394	608,151	741,907	808,785
TAS	-	86,624	114,348	142,073	155,935
NT	-	54,714	65,590	76,467	81,905
ACT	-	4,054	42,180	80,306	99,369
AUS	-	2,432,554	3,809,211	5,185,869	5,874,197

Source: AEAS

6.0. Industry Capacity

Capacity is referred to as the physical ability of the Australian Organic Recycling Industry and its resources available to meet an increase in the processing of organic materials and the supply of recycled organic material products.

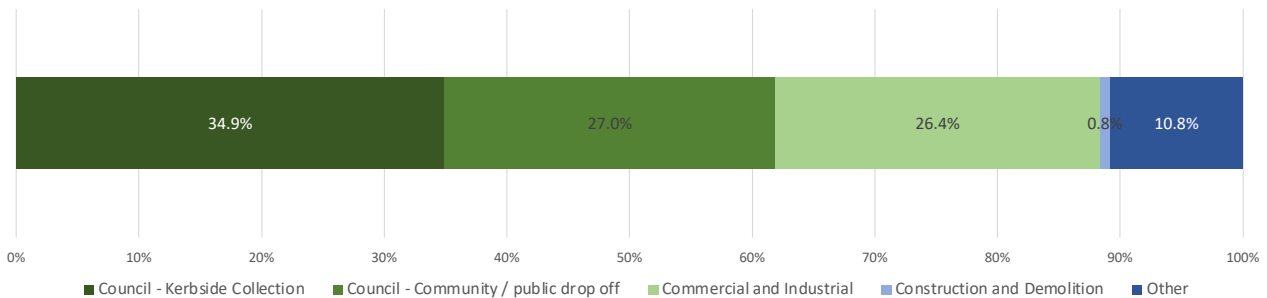
6.1 Tonnes Processed

Based on the AORA Organic Material Recycling Capability Survey 2023 (see Appendix two) there is considerable opportunity to increase the processing potential of the industry based on underutilised capacity. The key findings from the survey are provided below.

6.1.1 Recycled organic material by Source

According to the AORA Capability Survey, 61.9 per cent of material was sourced from councils, 27.2 per cent from commercial contracts and 10.8 per cent from elsewhere.

Figure 6: Percentage (%) breakdown of Industry’s organic material by source 2022-23



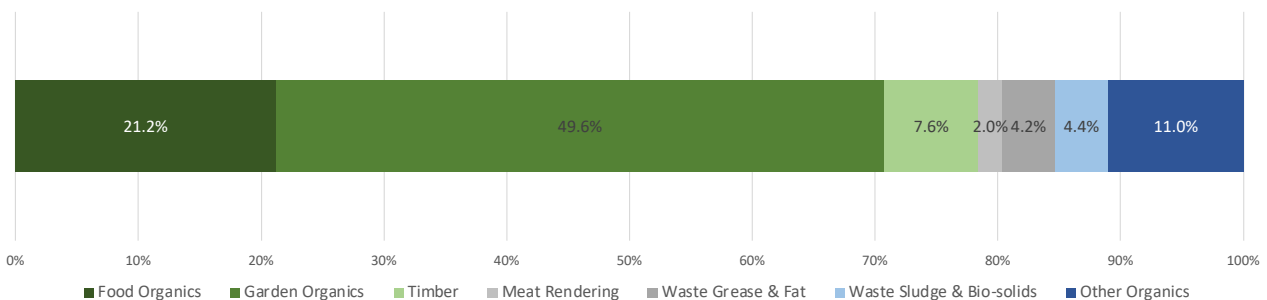
Source: AEAS

Council supply reflects residential supply from kerbside collection (34.9%) and transfer station drop-off (27.0%), as well as other council waste (including parks and garden maintenance). **Commercial and industrial (C&I)** represents waste produced from businesses as a by-product of commercial activities. These include timber residuals, food organics and a range of processing by-products (for example, organic waste materials from abattoirs). **Construction and demolition (C&D)** represent waste products produced from C&D activities. Within the recycled organics industry, this waste stream is largely timber residuals – offcuts from construction or timber products from demolition.

6.1.2 Recycled organic material by Material

According to the AORA Capability Survey, 21.2 per cent was food organics, 49.6 per cent was garden organics, 7.6 per cent was timber, 2.0 per cent was meat render, 4.2 per cent was waste grease, 4.4 per cent was waste sludge and 11.0 per cent was other organics.

Figure 7: Percentage (%) breakdown of Industry’s organic source in 2022-23



Source: AEAS

6.1.3 Key Survey Capacity Findings

The two key findings of the AORA Organic Material Recycling Capability Survey 2023 in respect to processing capacity included:

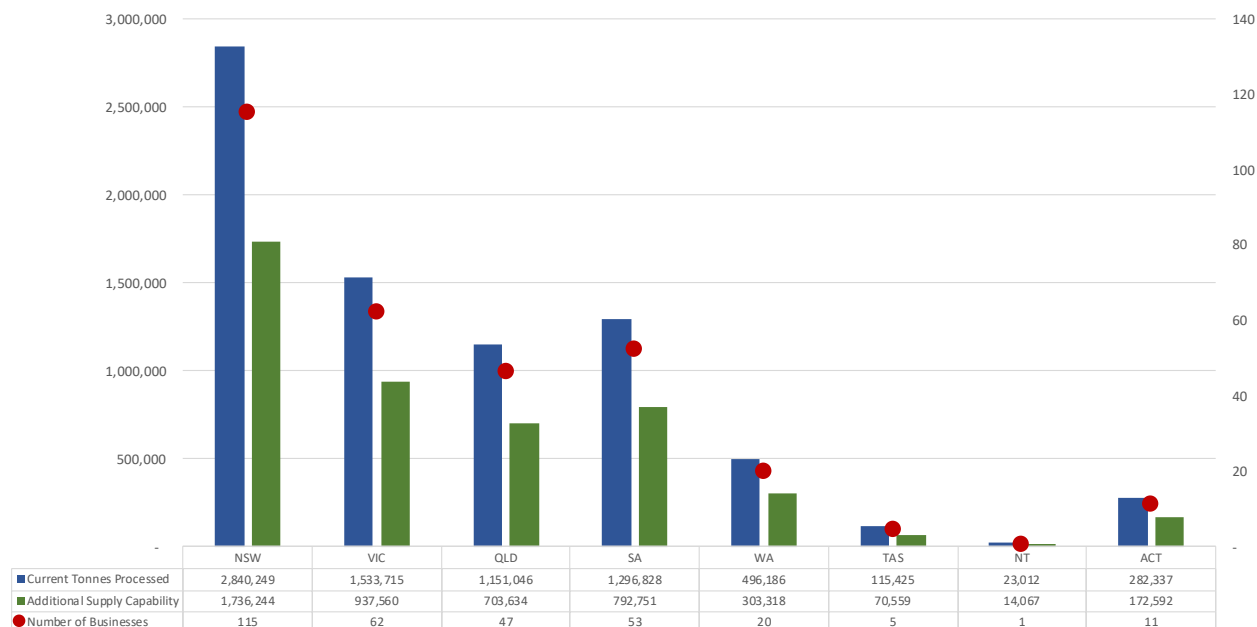
- Currently industry businesses on average occupy approximately 64.1 per cent of their operating site; and
- industry businesses are capable of processing an additional 61.1 per cent of organic materials given the physical capacity of their sites if unconstrained by obstacles.

This indicates that industry businesses on average are capable of lifting the tonnes of organic material recycled in each of the States and Territories. Modelling of the potential lift in processing capacity is provided below.

6.1.4 Modelled Tonnes Processed Capability

There are currently 314 organic recycling businesses operating in Australia processing/recycling 7.7 million tonnes of organic material. Based on the current additional capacity of the industry these businesses are estimated to be able to provide an additional 4.37 million of collective processing capacity each year. The State and Territory breakdowns are provided in figure 8 below.

Figure 8: Current Tonnes Processed and Additional Supply Capacity by State 2022-23



Source: AEAS

6.1.5 Modelled Surplus / Deficit against Needed Tonnes

Based on the existing and additional potential supply capacity of the industry, there is 2.1 million tonnes of excess recycling capacity available to achieve an Australian recycling rate of 70 per cent and 638,762 tonnes of excess recycling capacity available to achieve an Australian recycling rate of 80 per cent but then the industry nationally transitions into a deficit of recycling capacity to meet the 90 per cent (1,740,084 tonnes shortfall) and 95 per cent recycling rate (1,579,507 tonnes shortfall). This analysis however changes by State.

Table 16: Additional Potential Processing Capacity and Surplus / Deficit against Needed Tonnes

	Additional Supply Capacity	70%	80%	90%	95%
NSW	1,736,244	1,142,001	651,359	160,717	(84,604)
VIC	937,560	335,786	30,717	(274,353)	(426,888)
QLD	703,634	(200,488)	(494,084)	(787,679)	(934,477)
SA	792,751	945,562	782,130	618,699	536,984
WA	303,318	(206,290)	(349,975)	(493,660)	(565,502)
TAS	70,559	(22,495)	(52,277)	(82,060)	(96,951)
NT	14,067	(44,708)	(56,392)	(68,076)	(73,918)
ACT	172,592	168,237	127,281	86,325	65,847
AUS	4,730,728	2,117,607	638,762	(840,084)	(1,579,507)

Source: AEAS

Table 17: Tonnes Processed Percentage Surplus / Deficit against Needed Amount

	Current	70%	80%	90%	95%
NSW	-	33.3%	16.6%	3.6%	-1.8%
VIC	-	15.7%	1.3%	-10.0%	-14.7%
QLD	-	-9.8%	-21.0%	-29.8%	-33.5%
SA	-	82.7%	59.8%	42.1%	34.6%
WA	-	-20.5%	-30.4%	-38.2%	-41.4%
TAS	-	-10.8%	-21.9%	-30.6%	-34.3%
NT	-	-54.7%	-60.3%	-64.7%	-66.6%
ACT	-	58.7%	38.8%	23.4%	16.9%
AUS	-	20.5%	5.4%	-6.3%	-11.2%

Source: AEAS

Very importantly Tables 16 and 17 infer that:

- Only South Australia and the ACT are capable of meeting the required capacity for each of the 70 per cent, 80 per cent, 90 per cent and 95 per cent recycling rates;
- NSW is capable of meeting required capacity for a 90 per cent recycling rate but is not positioned to meet a 95 per cent recycling rate;
- Victoria is capable of meeting a 80 per cent recycling rate but not 90 per cent and 95 per cent recycling rates; and
- All other States and Territories have shortfalls for meeting required capacity for 70 per cent, 80 per cent, 90 per cent and 95 per cent recycling rates.

AEAS in Table 3 has prepared a traffic light report for each state and their ability to supply to the corresponding recycling rate. Given that shortfalls in process capacity exist, analysis confirms both **growth for the existing industry in the short / medium term** and **room for new industry businesses in the longer term**.

Table 18: Tonnes Processed Capacity Assessment

	70%	80%	90%	95%
NSW	Capacity is sufficient to meet target			Capacity is just short of target
VIC	Capacity is insufficient to meet target			
QLD	Capacity is insufficient to meet target			
SA	Capacity is sufficient to meet target			
WA	Capacity is insufficient to meet target			
TAS	Capacity is insufficient to meet target			
NT	Capacity is insufficient to meet target			
ACT	Capacity is sufficient to meet target			
AUS	Capacity is sufficient to meet target			Capacity is just short of target

Source: AEAS

Legend

Capacity is sufficient to meet target

Capacity is just short of target

Capacity is insufficient to meet target

On the basis of the above there will be a requirement to promote new industry participants once existing capacity is exhausted. This will particularly be the case for organic material recycling in most rural and regional areas to which there is little to no way to deal with organic waste but to landfill it due to low capacity and infrastructure.

Where there is currently insufficient scale to warrant recycling businesses operating there may now be the scale created under the 70 per cent, 80 per cent, 90 per cent and 95 per cent recycling targets to warrant doing so. Naturally, this opportunity will largely be in regional areas and will divert organic materials away from landfill. The nature of this growth will depend upon localised market demand and supply.

6.2 Tonnes Capable of Being Sold

The nature of the organics recycling industry is best described though figure 1 where potentially organic recyclable material is processed, turned into compostable or non-compostable products and in turn sold to end users. Accordingly, there need to also be assessment of product demand. Based on the AORA Organic Material Recycling Capability Survey 2023 (see appendix two) there is considerable opportunity to increase the amount of product tonnes sold by the industry.

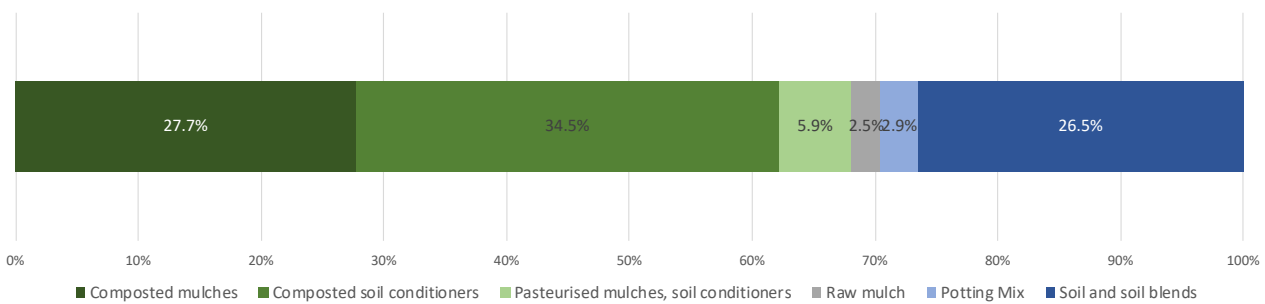
6.2.1 Recycled organics products

A range of recycled organics products are currently produced including:

- **Uncomposted mulch products:** these are essentially ‘raw’ products including mulch for application on top of garden beds, and potting mix which is bagged for retail sale. They typically do not contain garden organics products (although some uncomposted garden organics ‘mulch’ is sold as a budget product).
- **Compost products:** the composting process produces recycled organic compost of different ‘grades’ that correspond to product maturity. Pasteurised products have completed the pasteurisation process but are not stable nor mature; in contrast, compost is relatively stable in addition to being pasteurised, and ‘mature compost’ is fully stable. A range of products are then produced from compost products which are essentially variants of compost, reflecting age and expected use.

In 2022-23 a breakdown of products produced were composted mulches 27.7 per cent; composted soil conditioners 34.5 per cent; pasteurised mulch soil conditioners 5.97 per cent; raw mulch 2.4 per cent; potting mix 2.9 per cent; and soil and soil blends 26.5 per cent.

Figure 9: Percentage (%) breakdown of products produced in 2022-23



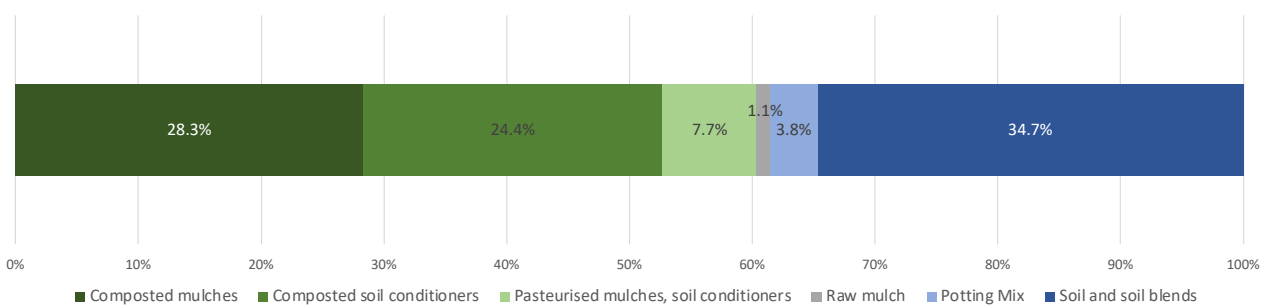
Source: AEAS

Compost has different uses for various segments of the market. The purpose for which the compost product will be purchased can generally be categorised in four areas of:

- Mulching (for water conservation and weed control);
- Soil conditioning (to improve soil structure and water holding capacity);
- Fertilising (to increase levels of nitrogen, phosphorus and potassium and micronutrients); and
- Other(including carbon storage and disease suppression).

In 2022-23 a breakdown of industry products sold were composted mulches 28.3 per cent; composted soil conditioners 24.4 per cent; pasteurised mulch soil conditioners 7.7 per cent; raw mulch 1.1 per cent; potting mix 3.8 per cent; and soil and soil blends 34.7 per cent.

Figure 10: Percentages (%) breakdown of Sales by Product in 2022-23



Source: AEAS

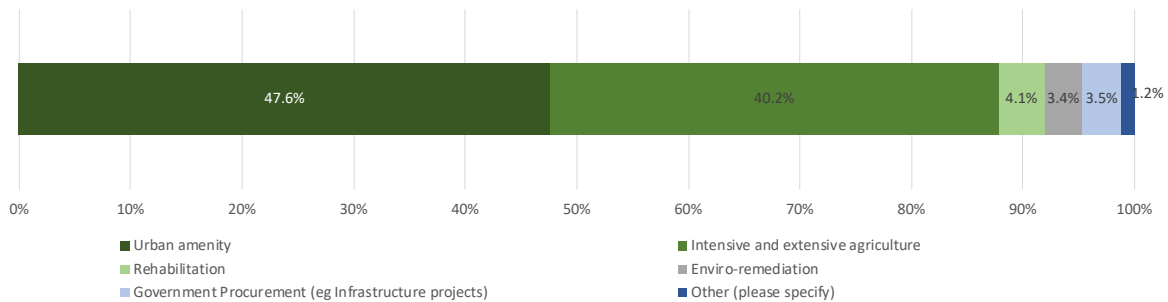
6.2.2 Recycled organics Market Segments

Products are typically used in four industry market segments including:

- **Urban amenity:** for use in urban areas including residential and commercial landscaping, retail nursery, special projects (such as highway verges).
- **Intensive agriculture:** agricultural use including viticulture, vegetable production, fruit and orchards, turf production, nursery production and wholesaling and **extensive agriculture:** agricultural use including pasture production (livestock including sheep, beef and dairy), broadacre cropping and forestry.
- **Rehabilitation:** use for landfill cover and rehabilitation, erosion stabilisation, land reclamation, restoration, revegetation and rectification.
- **Environmental remediation:** contaminated site and soils remediation, water purification and biofiltration uses.

In 2022-23 industry product sales were sold to the following market categories: Urban amenity 47.6 per cent; Intensive agriculture 40.2 per cent; Rehabilitation 4.1 per cent; Enviro-remediation 3.4 per cent; Government Procurement 3.5 per cent and other 1.2 per cent.

Figure 11: Percentage (%) of product sales by market categories 2022-23



Source: AEAS

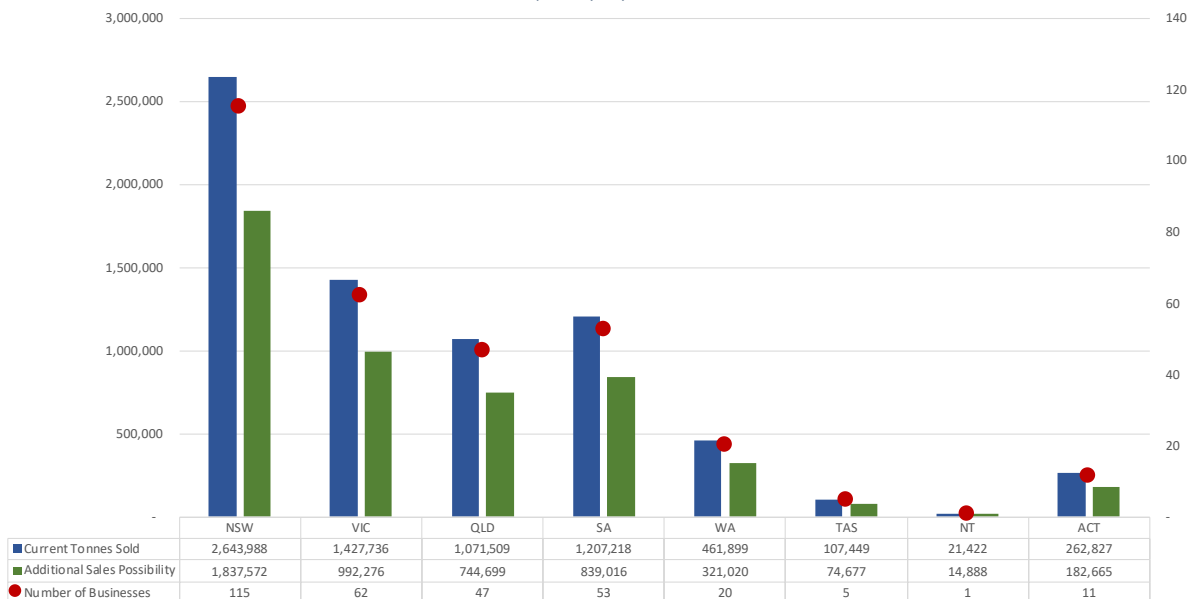
6.2.3 Key Survey Sales Capacity Findings

The key finding from the AORA Organic Material Recycling Capability Survey 2023 is that the industry believes it is largely unconstrained by current market demand for its product. The industry forecasts it is able to increase by 69.5 per cent the total tonnes of products realistically sold given their physical capacity of their operations and unconstrained by obstacles.

6.2.4 Modelled Tonnes Processed Capability

There are currently 314 organic recycling businesses operating in Australia selling approximately 7.2 million tonnes of organic products. Based on the current additional capacity of the industry these businesses are estimated to be able to sell an additional 5.0 million tonnes of products each year. The State and Territory breakdown are provided in figure 12 below.

Figure 12: Current Tonnes Sold and Additional Sales Capacity by State 2022-23



Source: AEAS

6.2.5 Modelled Surplus / Deficit against Needed Tonnes

Based on the existing and additional potential sales capacity of the industry there is approximately 2.6 million tonnes of excess market demand available to achieve an Australian recycling rate of 70 per cent and 1.2 million tonnes of excess market demand available to achieve an Australian recycling rate of 80 per cent. However then the current market nationally transitions into insufficient demand for organic recycling products to meet the 90 per cent (179,056 tonnes shortfall), and 95 per cent recycling rate (867,384 tonnes shortfall).

Table 19: Additional Potential Sales Needed and Surplus / Deficit against Needed Tonnes

	Additional Sales Capacity	70%	80%	90%	95%
NSW	1,837,572	1,284,391	827,653	370,914	142,545
VIC	992,276	432,085	148,096	(135,894)	(277,889)
QLD	744,699	(96,948)	(370,256)	(643,564)	(780,219)
SA	839,016	981,267	829,129	676,991	600,922
WA	321,020	(153,374)	(287,131)	(420,887)	(487,765)
TAS	74,677	(12,007)	(39,731)	(67,456)	(81,318)
NT	14,888	(39,826)	(50,702)	(61,579)	(67,017)
ACT	182,665	178,611	140,485	102,359	83,296
AUS	5,006,813	2,574,259	1,197,602	(179,056)	(867,384)

Source: AEAS

AEAS modelling indicates new market demand for organic recycled products will need to be established for Australia to meet the 90 per cent and 95 per cent recycling rates.

Based on modelling only NSW, South Australia and the ACT have sufficient market demand to increase production to be able to achieve 70 per cent, 80 per cent, 90 per cent and 95 per cent recycling rates. Modelling indicates that for Queensland, Western Australia, Tasmania and the Northern Territory, new market demand for organic recycled products will need to be established for these States to meet the 70 per cent, 80 per cent, 90 per cent and 95 per cent recycling rates.

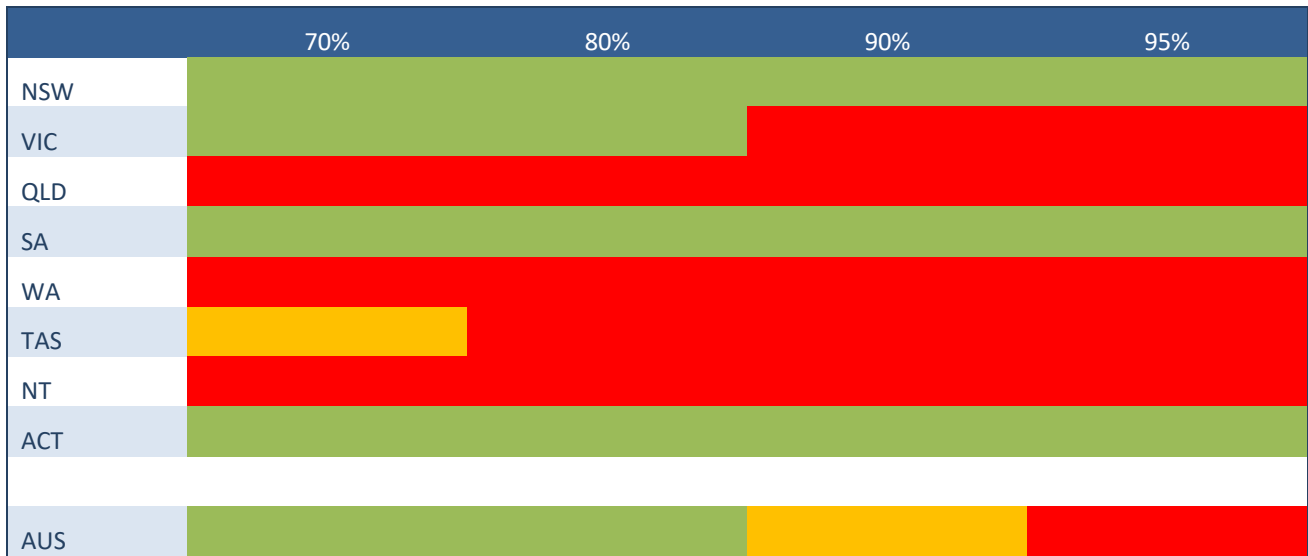
Table 20: Tonnes Sold Percentage Surplus / Deficit against Needed Amount

	Current	70%	80%	90%	95%
NSW	-	40.2%	22.7%	9.0%	3.3%
VIC	-	21.7%	6.5%	-5.3%	-10.3%
QLD	-	-5.1%	-16.9%	-26.2%	-30.0%
SA	-	92.1%	68.1%	49.4%	41.6%
WA	-	-16.4%	-26.8%	-35.0%	-38.4%
TAS	-	-6.2%	-17.9%	-27.0%	-30.9%
NT	-	-52.3%	-58.3%	-62.9%	-64.9%
ACT	-	66.9%	46.1%	29.8%	23.0%
AUS	-	26.7%	10.9%	-1.4%	-6.6%

Source: AEAS

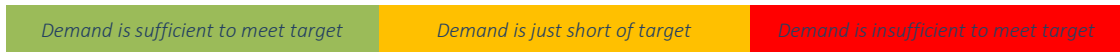
AEAS in Table 21 has traffic lighted each state and their ability to meet the corresponding recycling rate through mature markets to purchase organic recycled products.

Table 21 : Tonnes Sold Capacity Assessment



Source: AEAS

Legend

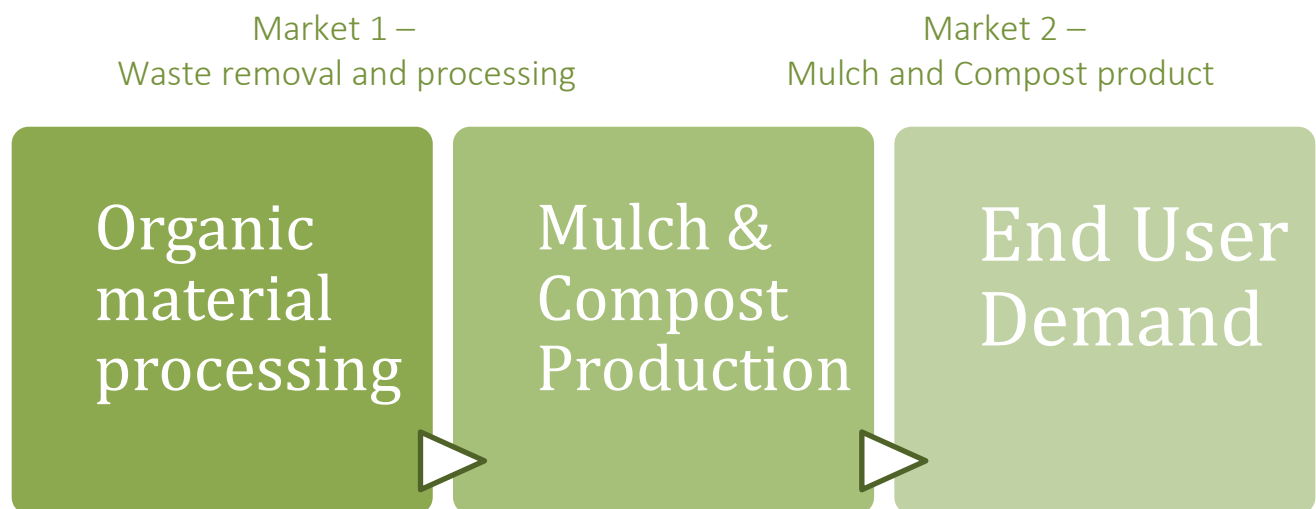


In summary, the above analysis confirms that the supply of the organics recycling industry’s products such as composts and mulches does not always meet current demand. Despite the strong performance of the industry in many states, there remains an untapped supply of feedstock and unmet demand for the quality products of organics recycling. Vitrally, this demand for the industry’s products is domestic, and usually local to the production process.

However, the analysis also confirms that without market development there will be occasions of a glut in the supply of recycled organic products. On this basis there will be requirement to promote the benefits of utilising organic recycled products and the benefits they provide as detailed on page 11.

In short, if any one of the below elements (see figure 13) are out of equilibrium it will have the potential to undermine the ability of Australia to achieve a higher recycling rate.

Figure 13: Organic Market Equilibrium



Source: AEAS

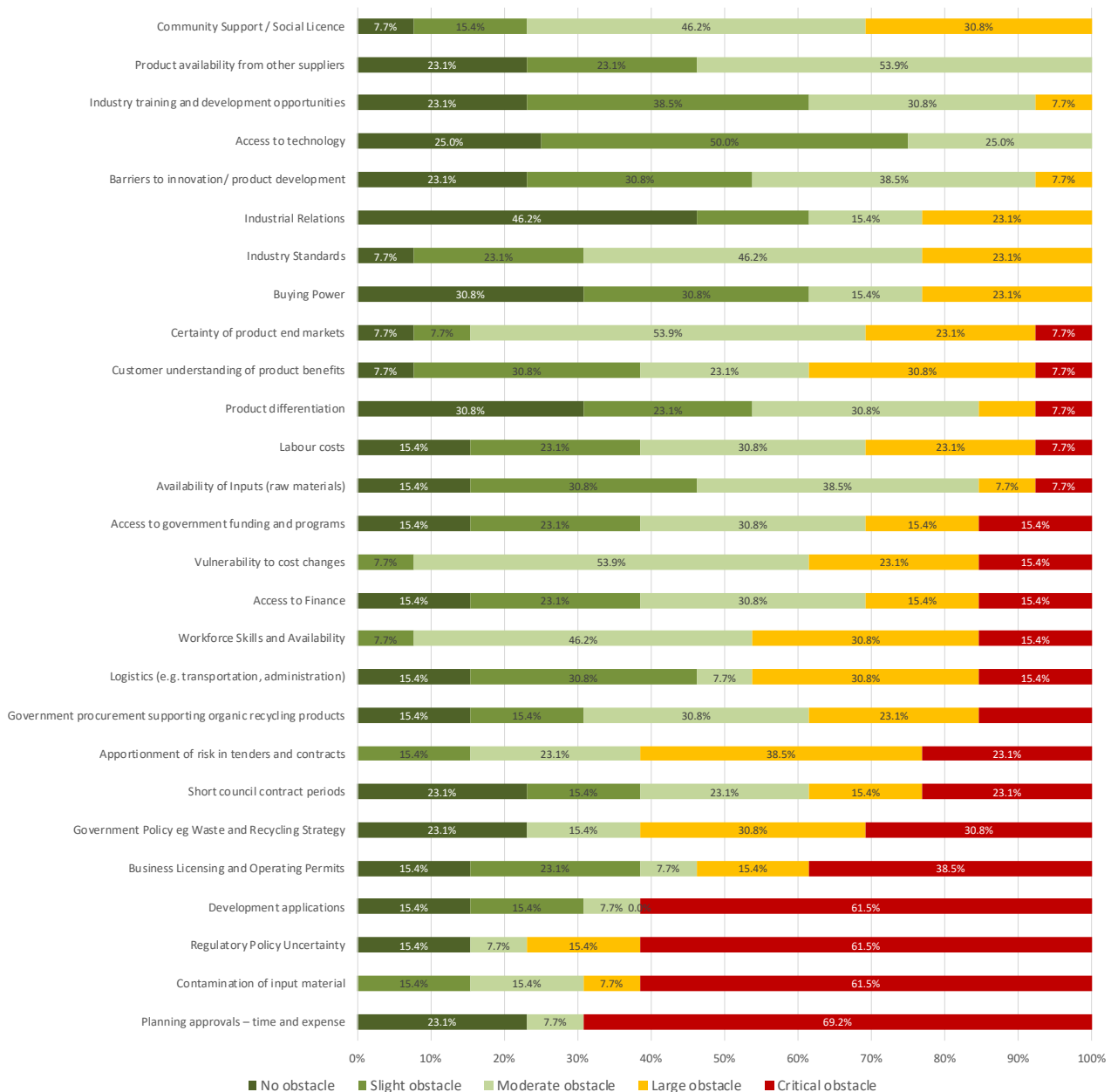
7.0. Industry Capability

Capability is the skills, processes and knowledge of the Australian Organic Recycling Industry to meet an increase in the processing of organic materials and the supply of recycled organic material products. Based on the AORA Organic Material Recycling Capability Survey 2023 (see appendix two) there is considerable existing capability available to lift the organic material recycling rate. The key findings from the survey in respect to capability are provided below.

7.1 Obstacles to Growth

Of profound importance, operational issues such as product availability, access to technology, industry standards and buying power are considered to be very minor obstacles to growth at present and indicate that the industry’s constraints are less internal and more externally driven. For example, based on the Survey the largest obstacles to the operation and growth of the industry at present include regulatory policy uncertainty; contamination of input material; government policy (eg waste and recycling strategy); business licensing and operating permits; development applications; and short council contract periods.

Figure 14: Industry Obstacles to Growth



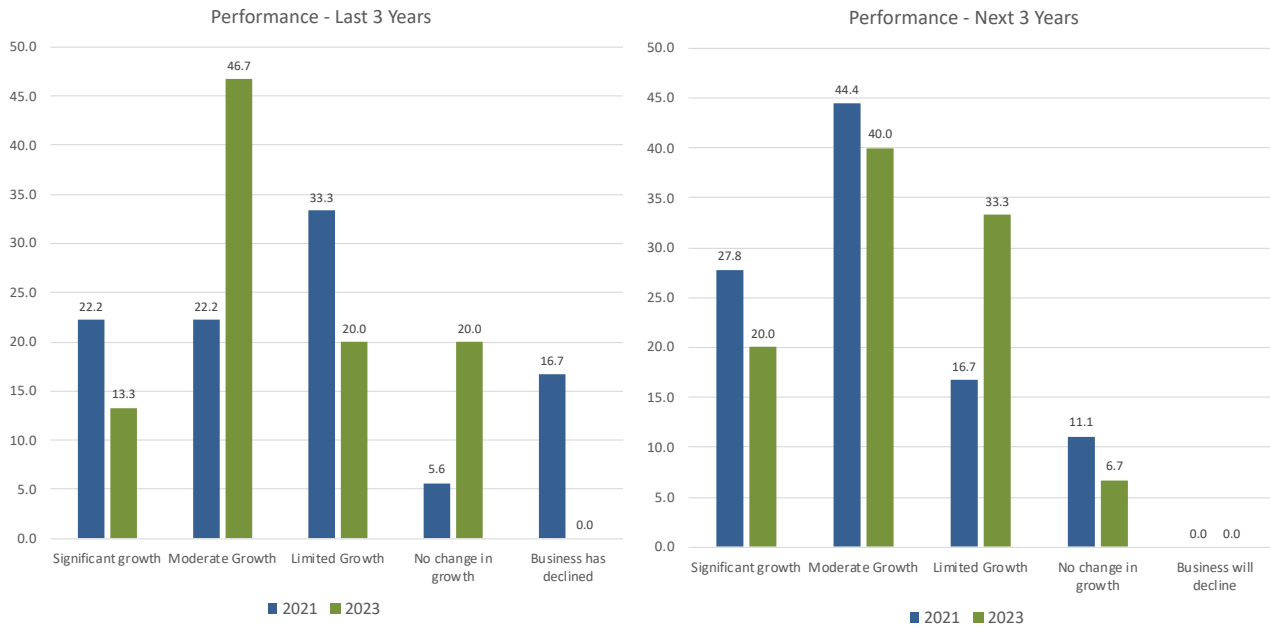
Source: AEAS

This illustrates that the industry’s own or internal capability constraints to growth are relatively minor and do not impede the ability to realise the 70 per cent, 80 per cent, 90 per cent and 95 per cent recycling rates in tandem to the supply capacity as analysed in section 6.

7.2 Business Performance

The survey also confirms that the AORI businesses are familiar with managing growth. Organic recycling businesses have indicated relatively good growth in their business over the last three years which are in line with headline statistics for the amount of organic recycling material being processed (see figure 15). For example, across the decade the Australian recycling industry’s recycled material has on average grown by 2.6 per cent each year.

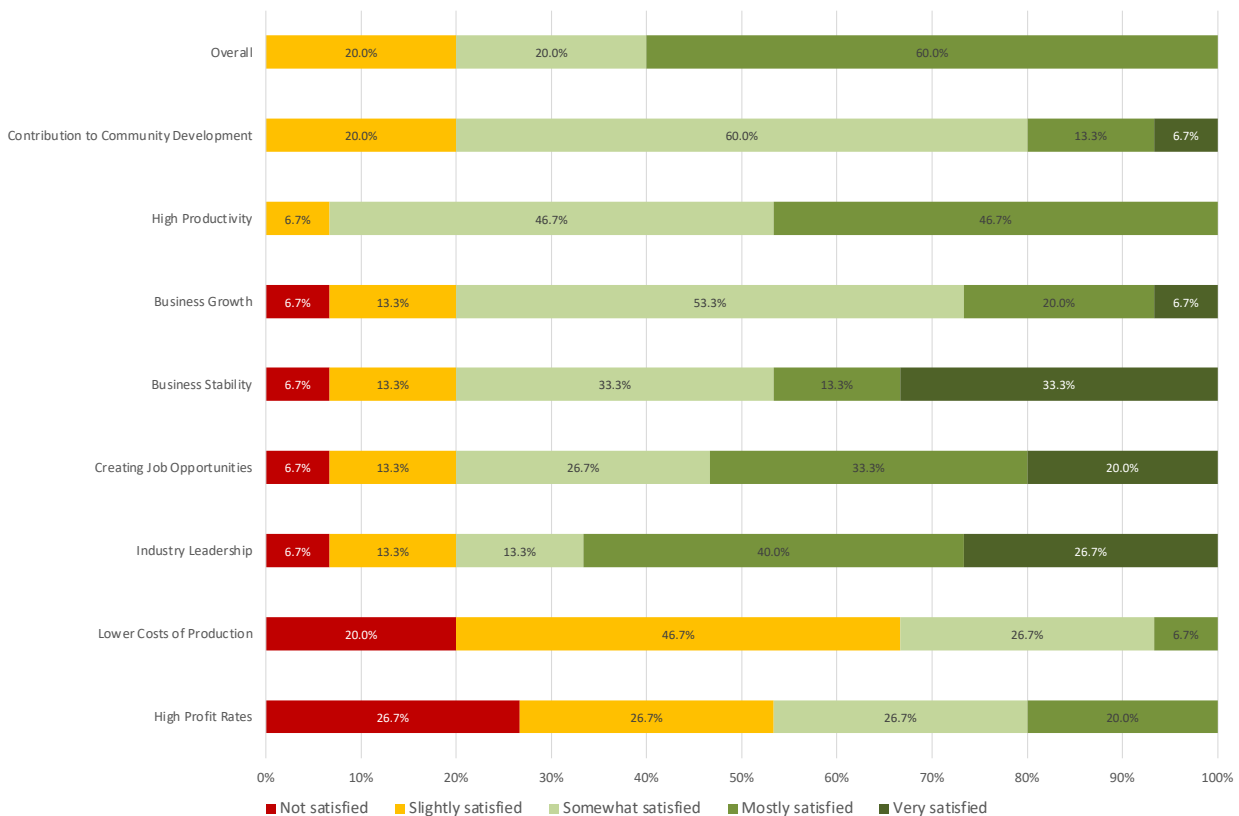
Figure 15: Industry Performance – Last 3 years and Next 3 years



Source: AEAS

One of the key prerequisites for the industry increasing its processing and supply is the ability to manage the growth necessary for the realisation of the 70 per cent, 80 per cent, 90 per cent and 95 per cent recycling rates. The majority of industry businesses (three in five businesses) are anticipating moderate to significant growth over the next three years.

Figure 16: Industry Satisfaction with Business Performance Indicators



Source: AEAS

Furthermore, industry satisfaction with its performance appears quite good with three in four businesses indicating they are somewhat, mostly or very satisfied with their overall performance. There is strong satisfaction with key areas such a leadership, stability and productivity. This confirms that the industry, with respect to its key performance indicators, is well positioned to lift capacity.

Table 22: Industry Satisfaction with Business Performance Indicators

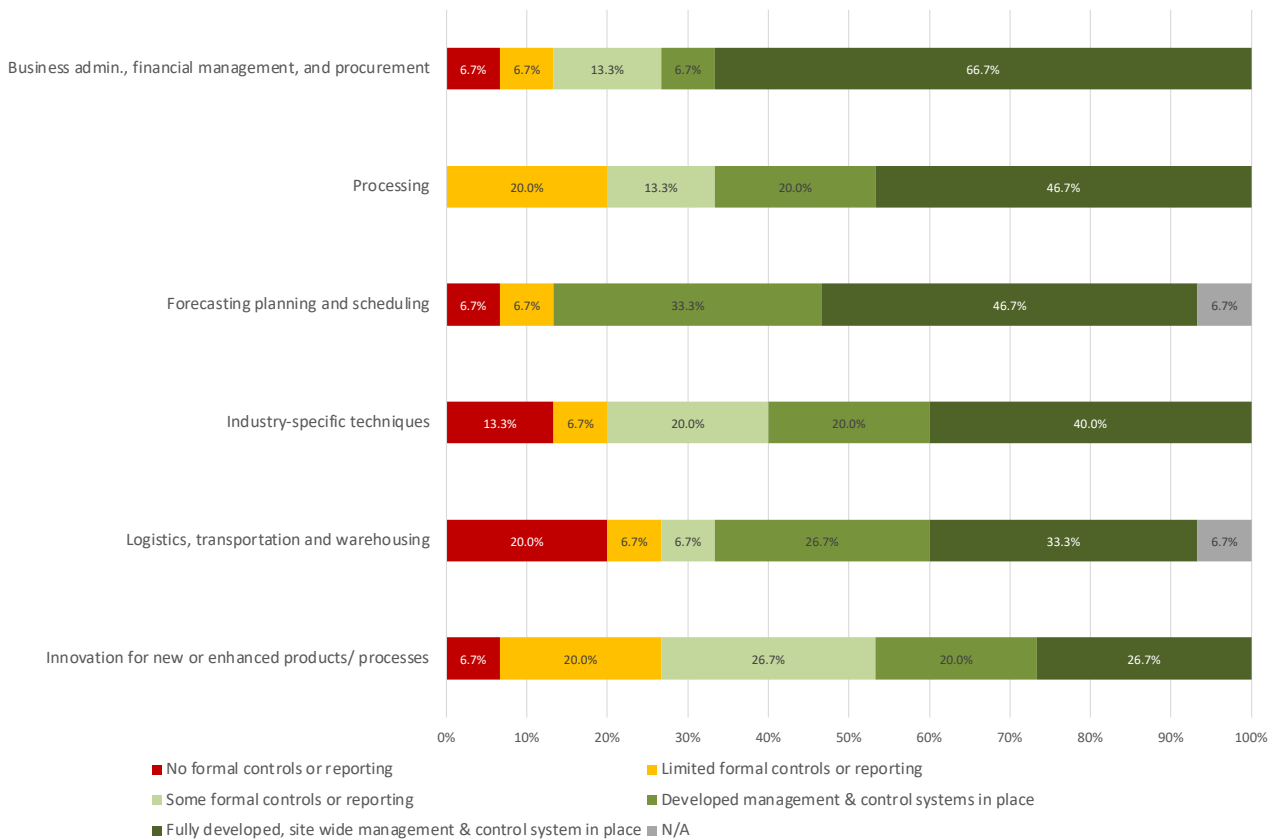
Best areas are:	Areas of improvement are:
<ul style="list-style-type: none"> • Industry leadership; • Business stability; and • High productivity 	<ul style="list-style-type: none"> • Profitability; and • Cost of production;

Source: AEAS

7.3 Industry Maturity

The industry's current stage of development for a range of business functions generally appears to be very mature indicating strong readiness to seize opportunities. AORI is assessed to have excellent capability in the areas of industry specific techniques; business administration, financial management and procurement; processing; and planning. The one area where there appears to be room for improvement is with transport and logistics.

Figure 17: Industry Capability Maturity



Source: AEAS

7.4 Overall Capability Assessment

In respect to AORI capability, namely the skills, processes and knowledge to meet an increase in the processing of organic materials and the supply of recycled organic material products, there is assessed to be good to excellent existing capability available to lift organic material recycling rates.

Appendix One: AORA Organic Material Recycling Capability Survey 2023

The survey was conducted electronically across the period of September and November 2023. Respondents to the survey processed 1.14 million tonnes of organic material each year representing 15.0 per cent of material processed in Australia each year.



Organic Recycling Capability Survey 2023

Each year the organics recycling industry is processing 7.7 million tonnes of waste to produce valuable product for further use across the Australian economy.

In doing so the Australian Organics Recycling Industry is providing a considerable contribution to Australian economy enabling over 5,030 jobs, \$386 million in wages, \$1.9 billion in supply chain opportunities and \$781 million in industry value add. In tandem to this fantastic contribution the industry is also activating considerable environmental benefits.

Australian Organics Recycling Association (AORA) modelling has confirmed as impressive as this contribution is, it is only a fraction what could be achieved if Governments across Australia were able to lift the recycling rate of organic material.

However this potential and considerable benefit is not only contingent upon the right policy settings but also industry's capacity to take up the opportunity. For example to achieve a 95 per cent recycling rate the industry would need to increase its processing capacity by 6.3 million tonnes each year.

Accordingly AORA has commissioned this survey to ascertain the organic recycling industry's existing and potential capacity. This survey will help establish the industry's ability to step up as an economic, employment and environment provider of benefit.

All survey returns are strictly confidential and results will only be produced in aggregate for the Industry. AEAS (who has been contracted to deliver the survey) will not share any individual response with any external party including AORA itself.

Please take a few moments to complete the survey by COB Friday 3 November 2023. If you have any questions about the survey please contact John McKew on

Appendix Two: Sources

AEAS, The Economic Contribution of the Australian Organics Recycling Industry 2021-22

Australian Bureau of Statistics - Australian and New Zealand Standard Industrial Classification 2006

Australian Bureau of Statistics 3101.0 - Australian Demographic Statistics

Australian Bureau of Statistics (ABS) - Waste Account, Australia, Experimental Estimates (ABS 2013a).

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Australian Bureau of Statistics - 6202.0 - Labour Force, Australia

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Australian Bureau of Statistics Source: 8155.0 - Australian Industry

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Department of the Environment and Energy - Headline economic value for waste and materials efficiency in Australia prepared by CIE 2017

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Green Industries SA Government of South Australia - South Australia’s Recycling Activity Survey 2019-20

New Zealand Ministry for the Environment - Recycling: Cost Benefit Analysis 2017

Organics Recycling in Australia Industry Statistics 2011

Organics Recycling in Australia Industry Statistics 2012

Senate Environment and Communications References Committee - Never waste a crisis: the waste and recycling industry in Australia 2018

Sustainability Victoria - FACTSHEET Market summary—recycled organics

Sustainability Victoria - Victorian Organics Resource Recovery Strategy September 2015

Sustainability Victoria - Victorian Recycling Industry Annual Report 2016-17

Sustainability Victoria - Victorian Recycling Industry Annual Waste Services Report 2016-17

Sustainability Victoria - Victoria's Waste Projection Model

Sustainability Victoria - Recycled Organics Market Analysis 2013

Sustainability Victoria - Resource Recovery Investment Prospectus

Zero Waste SA - Regional organic waste mapping in South Australia, Final report 2012

Appendix Three: AEAS Business Information

Australian Economic Advocacy Solutions delivers services in economic analysis, research and advocacy in Australia and was set up by Nick Behrens following two decades of experience applying these skills in the real world for Australia's business community. More specifically, AEAS provides:

- economic analysis and market research;
- government relations and submissions;
- media relations; and
- stakeholder relations.

AEAS delivers services nationally to exemplary organisations including AORA, Australian Industry Group, Australian Gas Industry Trust, Australian Steel Institute, BASF, Brisbane Airport Corporation, CCIQ, Canegrowers, IOR Petroleum, LifeFlight, Master Builders Australia, Natroads, NWRIC, Port of Brisbane, Property Council of Australia, Queensland Resources Council, RACQ, Remondis, Suncorp, VTA, Victorian Waste Management Association, unions, local government authorities, the Commonwealth and State Governments and many others.

AEAS can be engaged for either a special project (for the entire project or just the parts our clients need help with) or on an ongoing basis. We will take the time to understand your unique challenge and create a partnership with you to tailor a solution specific to your budget. We engage with confidentiality and integrity. Choose AEAS for our expertise, professionalism and ability to work with our valued clients to achieve exceptional results.

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Professional bio: Nick Behrens

Across his professional career Nick has realised many outstanding outcomes to complex challenges for the business community. He possesses significant experience in gathering and presenting information, and leveraging that information to achieve results across a range of economic areas including taxation, regulatory environment, workers compensation, employment legislation, migration, infrastructure and planning issues.

Nick's representations are based on extensive research and his preferred approach to advocacy has always been to achieve results rather than headlines by working with stakeholders behind the scenes to secure positive and lasting outcomes. He places much emphasis on having a thorough and convincing evidence that is readily understood and in turn leads to real-world solutions. As director of Australian Economic Advocacy Solutions (AEAS), Nick provides:

- exceptional understanding of social, political and economic issues impacting on business;
- considerable real-world application of project, business and economic research and analysis;
- significant expertise in advocacy, including government and stakeholder relations;
- in-depth and first-hand knowledge of the workings of government;
- extensive networks in political, government, business and community sectors;
- significant commercial expertise; and
- media commentary.

