The Economic Contribution of the Australian Organics Recycling Industry





August 2022



Australian Economic Advocacy Solutions



Foreword

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 to the environment the Australian Organics Recycling Industry is also providing an enormous economic benefit to everyday Australians as is evidenced in this report.

Nick Behrens – Director AEAS

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Contents

	Executive Summary 5					
1.0	The Australian Organics Recycling Industry	7				
	1.1 Sources of recycled organics	7				
	1.2 Recycled organics products	7				
	1.3 Recycled organics market segments	7				
2.0	Australian Organic Material Recycling	8				
	2.1 Organic material recycled in Australia	8				
	2.2 Organic material recycled by State	8				
	2.3 Organic material recycled by material	9				
	2.4 Organics recycling and recovery rates	9				
3.0	Economic Estimates Methodology	11				
4.0	Economic Contribution of Australian Organics Recycling Industry	12				
	4.1 Introduction	12				
	4.2 Number of organic recycling businesses	12				
	4.3 Industry employment	13				
	4.4 Wages and salaries paid to Australians	13				
	4.5 Industry sales	14				
	4.6 Supply chain expenditure and opportunity	14				
	4.7 Capital expenditure	15				
	4.8 Industry profits by state	15				
	4.9 Total contribution to the economy	16				
	4.10 Economic Summary – 2010-11 to 2021-22	16				
	4.11 Economic summary – State Breakdown	17				
5.0	Environmental Contribution of Australian Organics Recycling Industry	18				
6.0	Modelling of increased Organics recycling rates	19				
	6.1 Methodology	19				
	6.2 Scenario – No Change	20				
	6.3 Scenario: Achievement of 70 per cent recycling rate	21				
	6.4 Scenario: Achievement of 80 per cent recycling rate	23				
	6.5 Scenario: Achievement of 90 per cent recycling rate	25				
	6.5 Scenario: Achievement of 95 per cent recycling rate	27				



Figures:

1	Organic Markets	7
2	Kilotonnes of Organic Material Recycled in Australia	8
3	Kilograms of Organic Material Recycled Per Head of Population 2021-22	9
4	Tonnes of Total Organic Material Recycled by Material 2021-22	9
5	Organic Material Recycled & Energy Recovered in 2021-22 (tonnes)	10
6	Organic Material Recycled & Energy Recovered Rates in 2021-22 (percentage of total)	10
7	Contribution of Australian Organics Recycling Industry – 2021-22 key economic metrics (\$ millions)	12
8	Number of Organics Recycling Industry Businesses by State 2021-22	12
9	Organics Recycling Industry Employment by State 2021-22 (FTEs)	13
10	Organics Recycling Industry Wages and Salaries by State 2021-22 (\$ millions)	13
11	Organics Recycling Industry Turnover by State 2021-22 (\$ millions)	14
12	Organics Recycling Industry Supply Chain Expenditure by State 2021-22 (\$ millions)	14
13	Organics Recycling Industry Capital Expenditure by State 2021-22 (\$ millions)	15
14	Organics Recycling Industry Operating Profit before Tax by State 2021-22 (\$ millions)	15
15	Organics Recycling Industry Value Added by State 2021-22 (\$ millions)	16
16	Australian Organics Recycling Industry - Environmental Benefits 2021-22	18
17	Organic Material Recycling Rates in 2021-22	19

Tables:

1	Tonnes of Organic Material Recycled 2021-22	8
2	Economic contribution to Australian Economy 2010-11 to 2021-22 (\$ millions)	16
3	Economic Contribution by State in 2021-22 (\$ millions)	17
4	Australian Organics Recycling Industry - Environmental Benefits Summary 2021-22	19
5	Base Economic Contribution by State (\$ millions) No Change	20
6	Environmental Benefits as a result of recycling	20
7	Economic Contribution by State (\$ millions) – 70 per cent recycling rate	21
8	Economic Gain by State (\$ millions) – 70 per cent recycling rate	21
9	Environmental Benefits – 70 per cent recycling rate	22
10	Gain in Environmental Benefits – 70 per cent recycling rate	22
11	Economic Contribution by State (\$ millions) – 80 per cent recycling rate	23
12	Economic Gain by State (\$ millions) – 80 per cent recycling rate	23
13	Environmental Benefits – 80 per cent recycling rate	24
14	Gain in Environmental Benefits – 80 per cent recycling rate	24
15	Economic Contribution by State (\$ millions) – 90 per cent recycling rate	25
16	Economic Gain by State (\$ millions) – 90 per cent recycling rate	25
17	Environmental Benefits – 90 per cent recycling rate	26
18	Gain in Environmental Benefits – 90 per cent recycling rate	26
19	Economic Contribution by State (\$ millions) – 95 per cent recycling rate	27
20	Economic Gain by State (\$ millions) – 95 per cent recycling rate	27
21	Environmental Benefits – 95 per cent recycling rate	28
22	Gain in Environmental Benefits – 95 per cent recycling rate	28

Appendices:

Sources	29
About AEAS	30



Executive Summary

Australian Economic Advocacy Solutions (AEAS) was commissioned by AORA (Australian Organics Recycling Association) to determine the economic benefit of the Australian Organics Recycling Industry (AORI) to the Australian and all State economies.

AORI in 2021-22 recycled **7.7 million tonnes** of organic material. Across the decade AORI's recycled tonnage has grown by 2.6 per cent each year and compares to Australia's average population growth rate across the same time of 1.4 per cent.

Garden organics makes up the largest portion of organic materials recycled nationally comprising 41.6 per cent of materials followed by biosolids (18.8%), timber (13.7%) and food organics with 7.2 per cent.

Australia's overall organic material recycling rate in 2021-22 was 52.3 per cent equating to 296 kilograms of recycled organic material for each person in Australia.

Direct Economic Benefit

AORI is an important contributor to the Australian economy. Results of a macro-economic analysis of the Industry reveal the following.

- 314 businesses operating;
- Recycled and processed of 7.7 million tonnes of organic material in 2021-22;
- 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.

Indirect Economic Benefit

AORI is estimated to contribute a further:

- \$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.

Other key economic statistics include:

- 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.

Environmental Benefit

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

- 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.



Benefits of increasing organic material recycling rates

AEAS as part of this report has modelled what the economic and environmental contribution of AORI 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.

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.

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.

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.

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.



1.0 The Australian Organics Recycling Industry

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 organics markets: the service market for waste stream removal and processing and the product market for compost.



Source: AEAS

- 1.1 Sources of recycled organics
- Municipal sources: this supply reflects residential supply from kerbside collection and transfer station drop-off, as well as other council waste (including parks and garden maintenance);
- Commercial and industrial (C&I): 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); and
- Construction and demolition (C&D): 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.

1.2 Recycled organics products

A range of recycled organics products are 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.

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).

1.3 Recycled organics market segments

Products are used in five 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.
- **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.



2.0 Australian Organic Material Recycling

2.1 Organic Material Recycled in Australia

The Australian Organics Recycling Industry (AORI) in 2021-22 recycled 7,739 kilotonnes of organic material a 1.4 per cent increase on the previous financial year. Across the decade the AORI's recycled material has grown on average by 2.6 per cent each year and compares to Australia's average population growth rate over the same period of 1.4 per cent.



Figure 2: Kilotonnes of Organic Material Recycled in Australia

The noticeably higher growth rate for organic material recycled is largely representative of an increasingly higher portion of organic material being recycled. This has been driven by both population and economic growth but is also a reflection

2.2 Organic Material Recycled by State

New South Wales accounts for the largest tonnes of organic material being recycled in Australia at present with 2,840,249 tonnes (36.7% of total) in 2021-22. Victoria is the next largest with 1,533,716 tonnes (19.8%) followed by South Australia with 1,296,828 tonnes (16.8%) and then Queensland with 1,151,047 tonnes (14.9%)of organic material recycled.

of technological change, access to recycling markets, Local Government collection changes; and both Commonwealth

Table 1: Tonnes of	Organic Material	Recycled 2021-22
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and State Government waste and carbon reduction policies.

	NSW	VIC	QLD	SA	WA	TAS	NT	ACT	AUS
Food organics	299,395	40,513	73,052	8,464	98,431	35,221	-	163	555,238
Garden organics	1,167,812	583,430	625,883	309,218	222,485	47,423	-	259,997	3,216,247
Timber	301,525	299,670	109,371	261,748	63,877	-	-	22,177	1,058,367
Other organics	767,833	96,248	-	587,234	5,772	-	-	-	1,457,088
Biosolids	303,685	513,855	342,740	130,165	105,620	32,782	23,012	-	1,451,859
Total	2,840,249	1,533,716	1,151,047	1,296,828	496,186	115,425	23,012	282,336	7,738,799

Source: National Waste Report, AEAS



On a per head of population basis, South Australia is the Australian leader in recycling 725 kilograms per person each year followed by the Australian Capital Territory recycling 644 kilograms each year. These compare to the Australian average of 296 kilograms per person. This trend aligns with the overall percentage of organic material recycle which is discussed in section 2.4.



Figure 3: Kilograms of Organic Material Recycled Per Head of Population 2021-22

2.3 Organic Material Recycled by Material

Garden organics makes up the largest portion of organic materials recycled nationally comprising 41.6 per cent of materials followed by biosolids (18.8%), timber (13.7%) and food organics with 7.2 per cents. Garden organics represents the largest percentage of recycled materials in each of the Australian States.



Figure 4: Tonnes of Total Organic Material Recycled by Material 2021-22

Source: National Waste Report, AEAS

2.4 Organics Recycling and Recovery Rates

In 2021-22 Australia produced 14.8 million tonnes of organic waste of which 5.4 million tonnes was sent to landfill, 7.7 million was recycled and 1.6 million tonnes recovered through energy. Australia's overall organic material recycling rate was 52.3 per cent and the recovered rate was 63.2 per cent.





Figure. 5: Organic material recycled & energy recovered in 2021-22 (tonnes)

Source: National Waste Report, AEAS

South Australia currently has the highest organics material recycling rate at 79.4 per cent, followed by the ACT (68.9%), NSW (57.9%), Victoria 50.3%, Queensland (39.2%) Tasmania (38.8%) and Western Australia (34.5%). The Northern Territory had the lowest organics recycling rate at 19.7 per cent in 2021-22.



Figure 6: Organic material recycled & energy recovered rates in 2021-22 (percentage of total)

Source: National Waste Report, AEAS



3.0 Economic and Environment Benefit Estimate Methodology

- 3.1 AEAS was commissioned by AORA (Australian Organics Recycling Association) to determine the economic benefit of the Australian Organics Recycling Industry (AORI) to the Australian and State economies based on analysis of existing data as referenced in Appendix One.
- 3.2 This report provides a detailed summary of the level of economic contribution to the Australian and State economies by AORI and the multiplier and flow-on effects that are generated by that contribution. The report was developed in consultation with AORA and identifies a range of vital statistics that the Industry contributes to the economy including:
 - The contribution the Industry makes to Gross Domestic Product in industry value add;
 - The number of direct and indirect jobs created by the Industry;
 - The value of wages and salaries paid by the Industry;
 - Level of investment in buildings and plant and equipment made by the Industry; and
 - Environmental benefit of reduced greenhouse gas emissions.
- 3.3 The preparation of this report was undertaken in several stages including:
 - Processes involved in organic recycling, and a series of definitions for the sector were identified.
 - Desktop research was undertaken to establish the degree of information currently available, for use as a benchmark for AEAS calculated results. A summary of key reference material is provided below.
 - Section Four provides estimates of the direct and flow-on contribution of AORI to the Australian and State economies in terms of industry value add, employment, income (i.e. wages and salaries) and other indicators. Direct impacts, are the first round of effects from direct operational expenditure on goods and services by the Industry. The flow-on or indirect effects (i.e. the multiplier effects) are estimated in two parts: production-induced and consumption-induced effects. The production-induced effects arise from expenditure by Industry businesses / organisations on goods and services supplied by other firms in Australia. The consumption-induced effects arise from expenditure of Industry workers' income on goods and services supplied by Australian businesses.
- 3.4 The economic significance estimates in this report are produced using data primarily from the:
 - Australian Bureau of Statistics Australian Industry (Cat. No. 8155.0)
 - National waste report 2020; and
 - Other Australian Bureau of Statistics data including Census data and ABS Catalogues 6202.0 and 5220.0.
- 3.5 AEAS has used ABS Cat 8155.0 Australian Industry which presents estimates of the economic and financial performance of Australian industry (ANZSIC). The estimates are produced annually using a combination of directly collected data from the annual Economic Activity Survey (EAS), conducted by the ABS, and Business Activity Statement (BAS) data provided by businesses to the Australian Taxation Office (ATO).
- 3..6 AEAS has then used the National Waste Report 2020 to model the percentage of economic contribution created by organic recycling businesses operating within ANZSIC's Waste Collection, Treatment and Disposal Services sub-division and more specifically with the 2921: Waste Treatment and Disposal Services; and 2922: Waste Remediation and Materials Recovery Services classes.
- 3.7 One of the objectives of this project is to measure the economic value of waste related activities across the whole economy. Accordingly AEAS has used indirect waste industry multiplier estimates for economic activity prepared by EconSearch; and indirect employment multiplier prepared by Deloitte Access Economics for these estimates.
- 3.8 All estimates are presented in nominal terms (i.e. current prices in the year received), unless otherwise stated.
- 3.9 Finally AEAS has used conversion of recycling into environmental benefit ratios used by Green Industries SA to calculate the reduced greenhouse gas emissions benefit of AORI with further conversions into trees planted and cars taken off the road..

4.0 Economic Contribution of Australian Organics Recycling Industry

4.1 Introduction

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 \$781 million in industry value add to the Australian economy.

Industry value added \$781 Operating profit before tax \$325 Capital Expenditure \$156 Total expensiture \$1,916 Total Sales \$2,105 Wages and salaries \$386 Employment (FTEs) 5.032 1,000 2,000 3,000 4,000 5,000 6,000

Figure 7: Contribution of Australian Organics Recycling Industry 2021-22 key economic metrics (\$ millions)

Source: AEAS

4.2 Number of Organic Recycling Businesses

In total there are 314 organic recycling businesses operating in Australia. NSW has 115 organic recycling businesses, Victoria has 62, Queensland 47, South Australia 53, Western Australia 20, Tasmania 5 the Northern Territory 1 and the ACT has 11* organic recycling businesses. The average size organic recycling employs 16 persons and accordingly is defined by the Australian Bureau of Statistics as a small business.



Figure 8: Number of Organics Recycling Industry Businesses by State 2021-22



4.3 Industry Employment

The AORI is estimated to employ 5,032 Australians in 2021-22 with NSW organic recycling businesses employing 1,847, Victorian businesses employing 997 persons, Queensland employing 748 persons, South Australia employing 843 persons, Western Australia employing 323 persons and ACT employing 184 persons. Expressed alternatively one job is supported for every 1,538 tonnes of organic material recycled in Australia. AEAS estimates that a further 4,227 indirect jobs are provided through flow on activity.



Figure 9: Organics Recycling Industry Employment by State 2021-22 (FTEs)

4.4 Wages and Salaries Paid to Australians

The AORI is estimated to provide over \$386 million in wages to Australians. NSW organic recycling businesses provide \$141.5 million in wages, Victorian businesses providing \$76.4 million, Queensland businesses providing \$57.4 million, South Australia providing \$64.6 million, Western Australia providing \$24.7 million and ACT providing \$14.1 million in wages. The average salary provided to each AORI employee is \$76,710 and compares to Australian average weekly earnings of \$69,103. In addition, AEAS estimates that an additional \$40.5 million was paid by organics recycling businesses towards employee superannuation.



Figure 10: Organics Recycling Industry Wages and Salaries by State 2021-22 (\$ millions)



4.5 Industry Sales

Through the receipt of inputs and the sale of composted materials AORI earned over \$2.1 billion in sales (\$2,105 million) in 2021-22. NSW organic recycling businesses earned \$772.6 million in sales, Victorian businesses earned \$417.2 million, Queensland businesses earned \$313 million, South Australia earned \$352.8 million, Western Australia earned \$134.9 million and ACT organic recycling business earned \$76.8 million in sales. The average sales per organics recycling business was \$6.7 million in 2021-22. Expressed alternatively AORI turnover is estimated at \$272 per tonne of recycled organic material.





4.6 Supply Chain Expenditure

In 2021-22 Australian organics recycling businesses supported \$1.9 billion (\$1,916 million) of supply chain expenditure. NSW organic recycling businesses spent \$703.3 million in expenditure, Victorian businesses spent \$379.8 million, Queensland businesses spent \$285 million, South Australia spent \$321.2 million, Western Australia spent \$122.8 million and ACT organic recycling business spent \$69.9 million in expenditure. Each organics recycling business on average supported a \$6.1 million supply chain. Expressed alternatively AORI supply chain expenditure is estimated at \$248 per tonne of recycled organic material.



Figure 12: Organics Recycling Industry Supply Chain Expenditure by State 2021-22 (\$ millions)



4.7 Capital Expenditure

The AORI invested approximately \$156 million in 2021-22 in land, buildings, plant and equipment, vehicles and other recycling infrastructure. NSW organic recycling businesses invested \$57.1 million, Victorian businesses invested \$30.8 million, Queensland businesses invested \$23.1 million, South Australia invested \$26.1 million, Western Australia invested \$10 million and ACT organic recycling business invested \$5.7 million in land, buildings, plant and equipment, vehicles and other recycling infrastructure. Each organics recycling business on average invested \$496,815 in land, buildings, plant and equipment, vehicles and other recycling infrastructure in 2021-22.



Figure 13: Organics Recycling Industry Capital Expenditure by State 2021-22 (\$ millions)

4.8 Industry Profits by State

Whilst AORI is characterised as a fledgling industry it is a profitable industry. AORI recycling businesses earned \$325 million operating profits before taxes. NSW organic recycling businesses earned \$119.2 million in profits, Victorian businesses earned \$64.4 million, Queensland businesses earned \$48.3 million, South Australia earned \$54.4 million, Western Australia earned \$20.8 million and ACT organic recycling business earned \$11.9 million in operating profits before taxes.



Figure 14: Organics Recycling Industry Operating Profit before Tax by State 2021-22 (\$ millions)



4.9 Total Contribution to the Economy

While gross sales or turnover is an easy concept to understand, 'value added' is a better measure in the context of an industry's contribution to the economy. Value added for an industry is comprised of wages and salaries, gross operating surplus of business operating in the industry and indirect taxes (e.g. payroll tax). From the data, the direct value added attributable to AORI has been estimated. AORI's direct value add (contribution to GSP) in the last financial year is estimated by AEAS to \$781 million. A state breakdown of organics recycling industry's valued add to the economy is provided in Table 2.

In addition to the direct contribution of the economy, AORI is estimated to have contributed a further \$624 million in industry value add to GSP through flow-on demand for goods and services, including production induced and consumption induced effects.



Figure 15: Organics Recycling Industry Value Added by State 2021-22 (\$ millions)

Source: AEAS

\$350.0

4.10 Economic Summary – 2010-11 to 2021-22

A summary of the growth of AORI's economic contribution since 2010-11 is provided in table 2 below.

Table 2 : Economic contribution to Australian Economy	2010-11 to 2021-22 (\$ millions - curre	nt prices
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	Employment at end of June	Wages and salaries	Sales	Expenditure	Capital expenditure	Operating profit before tax	Industry value added
2010-11	3,561.1	273.0	1,489.8	1,356.2	110.1	229.8	552.6
2011-12	3,885.4	297.8	1,625.5	1,479.8	120.2	250.7	602.9
2012-13	4,302.7	329.8	1,800.0	1,638.7	133.1	277.6	667.7
2013-14	4,695.3	359.9	1,964.3	1,788.2	145.2	303.0	728.6
2014-15	4,835.7	370.7	2,023.0	1,841.7	149.5	312.0	750.4
2015-16	4,742.6	363.5	1,984.1	1,806.2	146.7	306.0	735.9
2016-17	4,745.8	363.8	1,985.4	1,807.5	146.8	306.2	736.4
2017-18	4,820.6	369.5	2,016.7	1,835.9	149.1	311.1	748.0
2018-19	4,888.9	374.7	2,045.3	1,861.9	151.2	315.5	758.6
2019-20	4,952.0	379.6	2,071.6	1,886.0	153.1	319.5	768.4
2020-21	4,960.4	380.2	2,075.2	1,889.2	153.4	320.1	769.7
2021-22	5,031.8	385.7	2,105.1	1,916.4	155.6	324.7	780.8



4.11 Economic Summary – State Breakdown

A summary of the State breakdown of AORI's economic contribution metrics is provided in table 3 below.

Table 3 : Economic contribution by State in 2021-22 (\$ millions)

	Employment at end of	Wages and	Salas	Evpondituro	Capital	Operating profit before	Industry
NOM	Julie	Salaries	Sales			Lax	
NSW	1,847	142	//3	/03	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



5.0 Environmental Contribution of Australian Organics Recycling Industry

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)
 - 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 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.

Figure 16: Australian Organics Recycling Industry - Environmental Benefits 2021-22



Source: AEAS

The environmental benefits by State are provided in table 4 on the next page.



Table 4: 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

6.0 Modelling of increased Organics recycling rates

AEAS as part of the report has modelled what the economic contribution of the Australian Organics Recycling Industry would be if the current organics recycling rates were increased under four scenarios - to at least 70 per cent, 80 per cent 90 per cent and 95 per cent. This analysis is designed to assist AORA advocacy to implement policies across Australian states that lead to improved recycling of organic material.

6.1 Methodology:

Utilising the economic and environment benefit metrics modelled in sections 4 and 5 of this report on a per tonne basis, AEAS has recalculated these metrics after increasing the tonnes of organic material recycled to achieve a 70 per cent, 80 per cent, 90 per cent and 95 per cent recycling rate in each State. Where the State is already achieving the percentage recycling rate the existing economic and environmental benefit has been retained.



Figure 17: Organic material recycling rates in 2021-22



6.2 Scenario – No Change

The baseline scenario of no change in recycling rates and the resulting economic and environmental benefits are provided below.

	Employment at end of June (FTE)	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

Table 5 : Base Economic contribution by State (\$ millions) No Change

Source: AEAS

Table 6: Environmental Benefits as a result of recycling

	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



6.3 Scenario: Achievement of 70 per cent recycling rate

If all Australian states were able to achieve 70 per cent recycling rate for organic material the Australian economy would benefit from:

- Organics recycling businesses would generate an extra \$752 in sales providing an additional \$684 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.

Employment Operating at end of Wages and Capital profit before Industry value added June (FTE) salaries Sales Expenditure expenditure tax NSW 2,233 171 934 850 69 144 346 VIC 1,388 106 581 529 43 90 215 QLD 1,336 102 559 509 41 86 207 54 SA 843 65 353 321 26 131 WA 654 50 274 249 20 42 101 TAS 135 10 57 52 4 9 21 NT 2 3 8 54 4 22 20 78 29 ACT 186 14 71 6 12 441 AUS 6,829 523 2,601 1,060 2,857 211

Table 7: Economic contribution by State (\$ millions) - 70 per cent recycling rate

Source: AEAS

Table 8 : Economic Gain by State (\$ millions) – 70 per cent recycling rate

	Employment at end of June (FTE)	Wages and salaries	Sales	Expenditure	Capital expenditure	Operating profit before tax	Industry value added
NSW	386	30	161	147	12	25	60
VIC	391	30	164	149	12	25	61
QLD	587	45	246	224	18	38	91
SA	-	-	-	-	-	-	-
WA	331	25	139	126	10	21	51
TAS	60	5	25	23	2	4	9
NT	39	3	16	15	1	2	6
ACT	3	0	1	1	0	0	0
AUS	1,797	138	752	684	56	116	279



If all Australian states were able to achieve 70 per cent recycling rate for organic material the Australian environment would benefit from 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.

Table 9: Environmental Benefits – 70 per cent recycling rate

	GHG emissions saved (tonnes)	Equivalent trees planted required for carbon absorption	Equivalent cars off the road each year
NSW	1,734,273	2,592,738	400,617
VIC	1,078,331	1,612,105	249,094
QLD	1,037,773	1,551,470	239,725
SA	654,843	978,991	151,269
WA	507,883	759,285	117,321
TAS	105,273	157,383	24,318
NT	41,299	61,742	9,540
ACT	144,767	216,427	33,441
AUS	5,304,442	7,930,141	1,225,326

Source: AEAS

Table 10: Gain in Environmental Benefits – 70 per cent recycling rate

	GHG emissions saved (tonnes)	Equivalent trees planted required for carbon absorption	Equivalent cars off the road each year
NSW	300,067	448,961	69,456
VIC	303,870	454,480	70,270
QLD	456,543	682,678	105,518
SA	-	-	-
WA	257,331	384,772	59,468
TAS	46,988	70,262	10,860
NT	29,679	44,373	6,857
ACT	2,199	3,323	522
AUS	1,396,678	2,089,014	323,015



6.4 Scenario: Achievement of 80 per cent recycling rate

If all Australian states were able to achieve 80 per cent recycling rate for organic material the Australian economy would benefit from:

- 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.

Employment Operating at end of Wages and Capital profit before Industry Sales value added June (FTE) salaries Expenditure expenditure tax NSW 2,552 196 1,068 972 79 165 396 VIC 664 604 49 102 246 1,587 122 QLD 1,527 117 639 582 47 99 237 55 SA 850 65 356 324 26 132 WA 747 57 313 285 23 48 116 TAS 155 12 65 59 5 10 24 NT 5 2 61 26 23 4 10 89 7 14 ACT 213 16 81 33 590 496 AUS 7,694 2,930 238 1,194 3,219

Table 11: Economic contribution by State (\$ millions) – 80 per cent recycling rate

Source: AEAS

Table 12: Economic Gain by State (\$ millions) – 80 per cent recycling rate

	Employment at end of June (FTE)	Wages and salaries	Sales	Expenditure	Capital expenditure	Operating profit before tax	Industry value added
NSW	705	54	295	269	22	46	109
VIC	589	45	247	224	18	38	91
QLD	779	60	326	297	24	50	121
SA	7	1	3	3	0	0	1
WA	425	33	178	162	13	27	66
TAS	80	6	33	30	2	5	12
NT	46	4	19	18	1	3	7
ACT	29	2	12	11	1	2	
AUS	2,662	204	1,114	1,014	82	172	413



If all Australian states were able to achieve 80 per cent recycling rate for organic material the Australian environment would benefit from 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.

Table 13: Environmental Benefits – 80 per cent recycling rate

	GHG emissions saved (tonnes)	Equivalent trees planted required for carbon absorption	Equivalent cars off the road each year
NSW	1,982,026	2,963,129	457,848
VIC	1,232,378	1,842,406	284,679
QLD	1,186,026	1,773,109	273,972
SA	660,206	987,008	152,508
WA	580,438	867,755	134,081
TAS	120,312	179,866	27,792
NT	47,199	70,562	10,903
ACT	165,448	247,345	38,219
AUS	5,974,033	8,931,180	1,380,002

Source: AEAS

Table 14: Gain in Environmental Benefits – 80 per cent recycling rate

	GHG emissions saved (tonnes)	Equivalent trees planted required for carbon absorption	Equivalent cars off the road each year
NSW	547,821	819,352	126,687
VIC	457,917	684,781	105,855
QLD	604,797	904,317	139,765
SA	5,363	8,182	1,303
WA	329,885	493,242	76,228
TAS	62,027	92,745	14,334
NT	35,579	53,193	8,220
ACT	22,880	34,242	5,299
AUS	2,066,269	3,090,053	477,691



6.5 Scenario: Achievement of 90 per cent recycling rate

If all Australian states were able to achieve 90 per cent recycling rate for organic material the Australian economy would benefit from:

- 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.

Employment Operating at end of Wages and Capital profit before Industry Sales value added June (FTE) salaries Expenditure expenditure tax NSW 2,872 220 1,201 1,094 89 185 446 VIC 1,785 137 747 680 55 115 277 QLD 1.718 132 719 654 53 111 267 SA 956 73 400 364 30 62 148 WA 841 64 352 320 26 54 130 TAS 174 13 73 66 5 11 27 2 NT 5 69 29 26 4 11 100 91 7 15 37 ACT 240 18 558 AUS 8,655 663 3,621 3,296 268 1,343

Table 15: Economic contribution by State (\$ millions) – 90 per cent recycling rate

Source: AEAS

Table 16: Economic Gain by State (\$ millions) – 90 per cent recycling rate

	Employment at end of June (FTE)	Wages and salaries	Sales	Expenditure	Capital expenditure	Operating profit before tax	Industry value added
NSW	1,025	79	429	390	32	66	159
VIC	788	60	330	300	24	51	122
QLD	970	74	406	369	30	63	150
SA	113	9	47	43	3	7	18
WA	518	40	217	197	16	33	80
TAS	99	8	41	38	3	6	15
NT	54	4	23	21	2	3	8
ACT	56	4	24	21	2	4	9
AUS	3,623	278	1,516	1,380	112	234	562



If all Australian states were able to achieve 90 per cent recycling rate for organic material the Australian environment would benefit from 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.

Table 17: Environmental Benefits – 90 per cent recycling rate

	GHG emissions saved (tonnes)	Equivalent trees planted required for carbon absorption	Equivalent cars off the road each year
NSW	2,229,779	3,333,520	515,079
VIC	1,386,426	2,072,707	320,264
QLD	1,334,279	1,994,747	308,219
SA	742,732	1,110,384	171,571
WA	652,993	976,224	150,841
TAS	135,351	202,349	31,266
NT	53,099	79,383	12,266
ACT	186,129	278,264	42,996
AUS	6,720,788	10,047,578	1,552,502

Source: AEAS

Table 18: Gain in Environmental Benefits – 90 per cent recycling rate

	GHG emissions saved (tonnes)	Equivalent trees planted required for carbon absorption	Equivalent cars off the road each year
NSW	795,574	1,189,743	183,918
VIC	611,965	915,082	141,440
QLD	753,050	1,125,956	174,011
SA	87,889	131,558	20,366
WA	402,440	601,711	92,988
TAS	77,066	115,228	17,808
NT	41,478	62,013	9,583
ACT	43,561	65,160	10,077
AUS	2,813,024	4,206,451	650,191



6.6 Scenario: Achievement of 95 per cent recycling rate

If all Australian states were able to achieve 95 per cent recycling rate for organic material the Australian economy would benefit from:

- 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.

Employment Operating at end of Wages and Capital profit before Industry value added June (FTE) salaries Sales Expenditure expenditure tax NSW 3,030 470 232 1,268 1,154 94 196 VIC 789 1,885 144 718 58 122 292 QLD 1,813 139 758 690 56 117 281 SA 1,009 77 422 384 31 65 157 WA 887 68 371 338 27 57 138 TAS 184 14 77 70 6 12 29 NT 73 6 2 5 30 28 11 ACT 253 19 106 96 8 16 39 589 AUS 700 282 9,133 3,821 3,478 1,417

Table 19 : Economic contribution by State (\$ millions) – 95 per cent recycling rate

Source: AEAS

Table 20: Economic Gain by State (\$ millions) – 95 per cent recycling rate

	Employment at end of June (FTE)	Wages and salaries	Sales	Expenditure	Capital expenditure	Operating profit before tax	Industry value added
NSW	1,184	91	495	451	37	76	184
VIC	888	68	371	338	27	57	138
QLD	1,065	82	445	406	33	69	165
SA	166	13	70	63	5	11	26
WA	565	43	236	215	17	36	88
TAS	109	8	46	41	3	7	17
NT	58	4	24	22	2	4	9
ACT	69	5	29	26	2	4	11
AUS	4,101	314	1,716	1,562	127	265	636
Source: AEA	S						

The economic contribution of the Australian Organics Recycling Industry 2021-22



If all Australian states were able to achieve 95 per cent recycling rate for organic material the Australian environment would benefit from 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.

Table 21: Environmental Benefits – 95per cent recycling rate

	GHG emissions saved (tonnes)	Equivalent trees planted required for carbon absorption	Equivalent cars off the road each year
NSW	2,353,656	3,518,715	543,694
VIC	1,463,449	2,187,857	338,057
QLD	1,408,406	2,105,567	325,342
SA	783,995	1,172,072	181,103
WA	689,270	1,030,459	159,221
TAS	142,870	213,591	33,003
NT	56,049	83,793	12,947
ACT	196,470	293,723	45,385
AUS	7,094,165	10,605,776	1,638,752

Source: AEAS

Table 22: Gain in Environmental Benefits – 95 per cent recycling rate

	GHG emissions saved (tonnes)	Equivalent trees planted required for carbon absorption	Equivalent cars off the road each year
NSW	919,451	1,374,938	212,533
VIC	688,989	1,030,232	159,232
QLD	827,177	1,236,775	191,135
SA	129,152	193,246	29,898
WA	438,718	655,946	101,368
TAS	84,585	126,470	19,545
NT	44,428	66,423	10,264
ACT	53,902	80,619	12,465
AUS	3,186,401	4,764,649	736,441



Sources:

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). Australian Bureau of Statistics 5220.0 - Australian National Accounts: State Accounts, 2017-18 AORA Capability Statement - The Australian Recycled Organics Industry at a Glance 2015 Australian Bureau of Statistics - 6202.0 - Labour Force, Australia Australian Bureau of Statistics 6302.0 - Average Weekly Earnings, Australia Australian Bureau of Statistics Source: 8155.0 - Australian Industry Australian Bureau of Statistics 8165.0 - Counts of Australian Businesses, including Entries and Exits Australian National Waste Report 2016 prepared for Department of the Environment and Energy Australian National Waste Report 2018 prepared for Department of the Environment and Energy Australian National Waste Report 2020 prepared for Department of the Environment and Energy Department of the Environment and Energy - Headline economic value for waste and materials efficiency in Australia prepared by CIE 2017 Deloitte Access Economics Pty Limited - Employment in waste management and recycling Deloitte Access Economics Pty Limited - Economic effects of the South Australian solid waste levy Department of Environment and Conservation NSW - Analysis of Markets for Recycled Organic Products 2004 Econsearch – Economic Aspects of the Zero Waste SA Strategy Review Environment Protection Authority Government of South Australia - Organic waste economic values analysis Summary report 2002 Green Industries SA Government of South Australia - South Australia's Recycling Activity Survey 2015-16 Green Industries SA Government of South Australia - South Australia's Recycling Activity Survey 2016-17 Green Industries SA Government of South Australia - South Australia's Recycling Activity Survey 2017-18 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



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 firsthand knowledge of the workings of Government;
- Extensive networks in political, government, business and community sectors;
- Significant commercial expertise; and
- Media commentator.





