

The Economic Contribution of the Australian Organics Recycling Industry



March 2020

A E A S

Australian Economic
Advocacy Solutions

Foreword

Each year the organics recycling industry is processing 7.5 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

COPYRIGHT

This work is copyright. Apart from any use permitted under the Copyright Act 1968, no part may be produced without prior permission.

Requests and inquiries concerning reproduction and rights should be directed to:
AEAS, PO Box 847 BULIMBA QLD 4171

REPORT PREPARATION

This report has been prepared by AEAS

DISCLAIMER

Whilst every effort has been made to ensure the accuracy of the analyses, the nature of certain input data and parameters used in the preparation of this report means that AEAS are unable to make any warranties in relation to the information contained herein. AEAS disclaims liability for any loss or damage that may arise as a consequence of any person relying on the information contained in this document.

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 – 2009-10 to 2018-19	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 2018-19	9
4	Tonnes of Total Organic Material Recycled by Material 2018-19	9
5	Organic Material Recycled & Energy Recovered in 2018-19 (tonnes)	10
6	Organic Material Recycled & Energy Recovered Rates in 2018-19 (<i>percentage of total</i>)	10
7	Contribution of Australian Organics Recycling Industry – 2018-19 key economic metrics (\$ millions)	12
8	Number of Organics Recycling Industry Businesses by State 2018-19	12
9	Organics Recycling Industry Employment by State 2018-19 (FTEs)	13
10	Organics Recycling Industry Wages and Salaries by State 2018-19 (\$ millions)	13
11	Organics Recycling Industry Turnover by State 2018-19 (\$ millions)	14
12	Organics Recycling Industry Supply Chain Expenditure by State 2018-19 (\$ millions)	14
13	Organics Recycling Industry Capital Expenditure by State 2018-19 (\$ millions)	15
14	Organics Recycling Industry Operating Profit before Tax by State 2018-19 (\$ millions)	15
15	Organics Recycling Industry Value Added by State 2018-19 (\$ millions)	16
16	Australian Organics Recycling Industry - Environmental Benefits 2018-19	18
17	Organic Material Recycling Rates in 2018-19	19

Tables:

1	Tonnes of Organic Material Recycled 2018-19	8
2	Economic contribution to Australian Economy 2009-10 to 2018-19 (\$ millions)	16
3	Economic Contribution by State in 2018-19 (\$ millions)	17
4	Australian Organics Recycling Industry - Environmental Benefits Summary 2018-19	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 2018-19 recycled **7.5 million tonnes** of organic material. Across the decade AORI's recycled tonnage has grown by 3.4 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 2018-19 was 51.5 per cent equating to 298 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.

- 305 businesses operating;
- Recycled and processed of 7.5 million tonnes of organic material in 2018-19;
- Providing 4,845 jobs to Australian residents,
- Pays over a \$366 million in wages and salaries and an additional \$35 million towards employee superannuation;
- Provides an average livelihood to each employee within the industry of \$75,540 which compares to Australian average weekly earnings of \$64,390;
- Has a collective industry turnover of over \$2 billion;
- Sources and provides \$1.9 billion in benefit across its supply chain;
- Invests \$175 million in land, buildings, plant and equipment and vehicles each year; and
- Contributes \$724 million in industry value add to the Australian economy.

Indirect Economic Benefit

AORI is estimated to contribute a further:

- \$579 million in industry value add to GDP through flow-on demand for goods and services, including production induced and consumption induced effects; and
- 4,070 indirect jobs provided through flow on activity.

Other key economic statistics include:

- One job is supported for every 1,550 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 \$271 per tonne of recycled organic material; and
- Supply chain expenditure is estimated at \$250 per tonne of recycled organic material.

Environmental Benefit

The total estimated greenhouse gas savings from organics recycling in Australian in 2018-19 is approximately 3.8 million tonnes of CO₂-e. These GHG savings are considered equivalent to:

- 5.7 million trees that would have to be planted to absorb the same amount of CO₂.
- The greenhouse gas emissions that 876,663 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 \$771 million in sales providing an additional \$712 million in supply chain opportunity with an extra \$274 million in industry value add towards the Australian economy;
- Organics recycling businesses would provide 1,834 extra jobs paying \$139 million in livelihood to everyday Australians; and
- An extra 1,436,829 tonnes of greenhouse gas emissions would be saved equivalent to 2,149,011 trees planted; and 332,279 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 \$401 million in industry value add towards the Australian economy;
- Organics recycling businesses would provide 2,682 extra jobs paying \$203 million in livelihood to everyday Australians; and
- An extra 2,102,377 tonnes of greenhouse gas emissions would be saved which is equivalent to 23,144,006 trees planted; and 486,021 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 \$542 million in industry value add towards the Australian economy;
- Organics recycling businesses would provide 3,624 extra jobs paying \$274 million in livelihood to everyday Australians; and
- An extra 2,839,760 tonnes of greenhouse gas emissions would be saved which is equivalent to 4,246,394 trees planted; and 656,356 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 \$612 million in industry value add towards the Australian economy;
- Organics recycling businesses would provide 4,094 extra jobs paying \$309 million in livelihood to everyday Australians; and
- An extra 3,208,451 tonnes of greenhouse gas emissions would be saved which is equivalent to 4,797,587 trees planted; and 741,524 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.

Figure 1: Organic Markets



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:

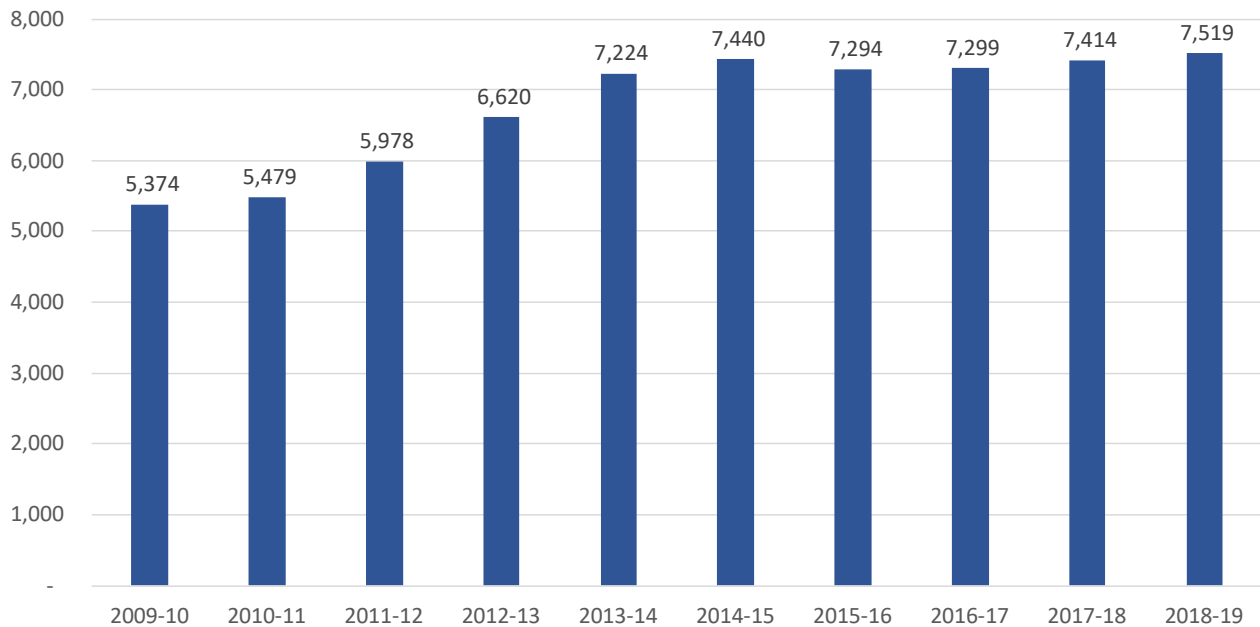
- **Urban amenity:** for use in urban areas including residential and commercial landscaping, retail nursery, special projects (such as highway verges).
- **Intensive agriculture:** agricultural use including viticulture, vegetable production, fruit and orchards, turf production, nursery production and 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 2018-19 recycled 7,519 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 3.4 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



Source: National Waste Report, AEAS

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 of technological change, access to recycling markets, Local Government collection changes; and both Commonwealth and State Government waste and carbon reduction policies.

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 2,759,515 tonnes (36.7% of total) in 2018-19. Victoria is the next largest with 1,490,119 tonnes (19.8%) followed by South Australia with 1,259,966 tonnes (16.8%) and then Queensland with 1,118,328 tonnes (14.9%) of organic material recycled.

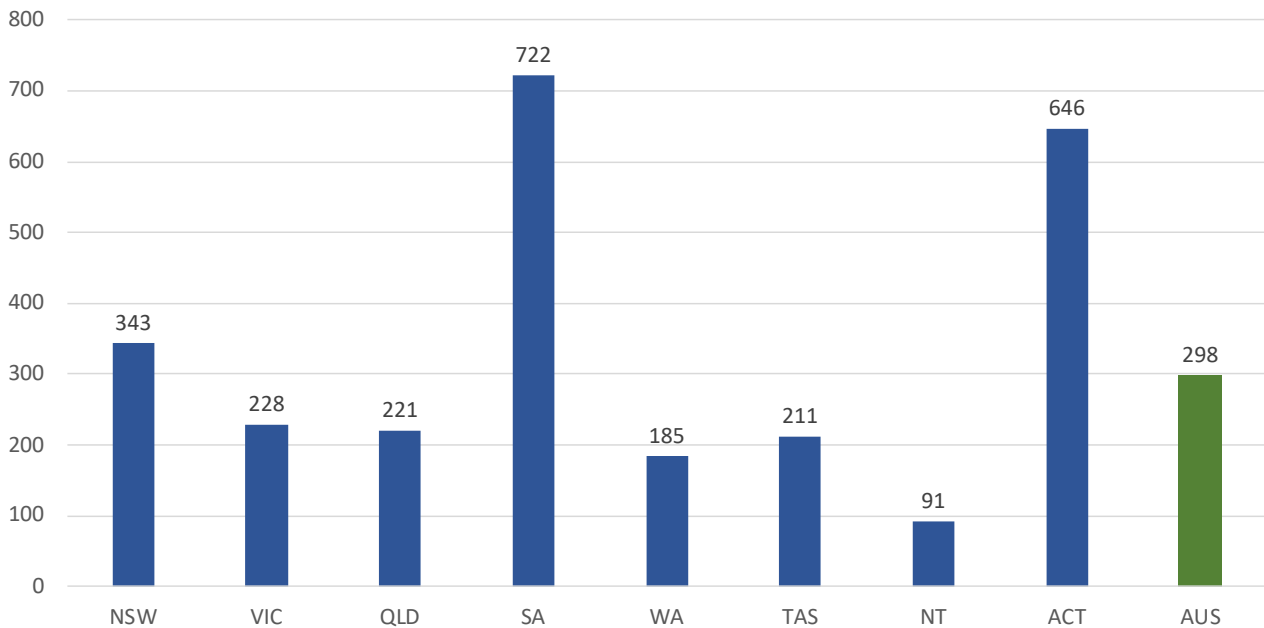
Table 1: Tonnes of Organic Material Recycled 2018-19

	NSW	VIC	QLD	SA	WA	TAS	NT	ACT	AUS
Food organics	290,885	39,361	70,975	8,223	95,633	34,220	-	158	539,455
Garden organics	1,134,617	566,846	608,092	300,428	216,161	46,075	-	252,606	3,124,825
Timber	292,954	291,152	106,262	254,308	62,061	-	-	21,547	1,028,283
Other organics	746,007	93,512	-	570,542	5,608	-	-	-	1,415,670
Biosolids	295,052	499,249	332,998	126,465	102,618	31,850	22,358	-	1,410,590
Total	2,759,515	1,490,119	1,118,328	1,259,966	482,082	112,144	22,358	274,311	7,518,824

Source: National Waste Report, AEAS

On a per head of population basis, South Australia is the Australian leader recycling 722 kilograms per person each year followed by the Australian Capital Territory recycling 646 kilograms each year. These compare to the Australian average of 298 kilograms per person. This trend aligns with the overall percentage of organic material recycle which is discussed in section 2.4.

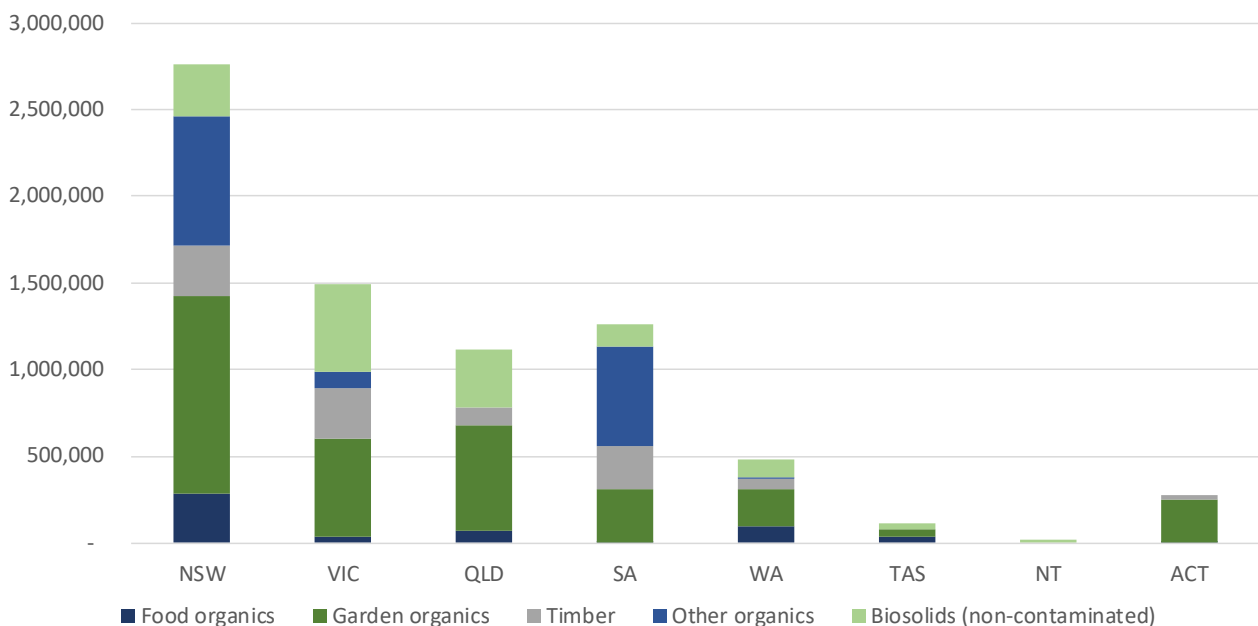
Figure 3: Kilograms of Organic Material Recycled Per Head of Population 2018-19



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 2018-19

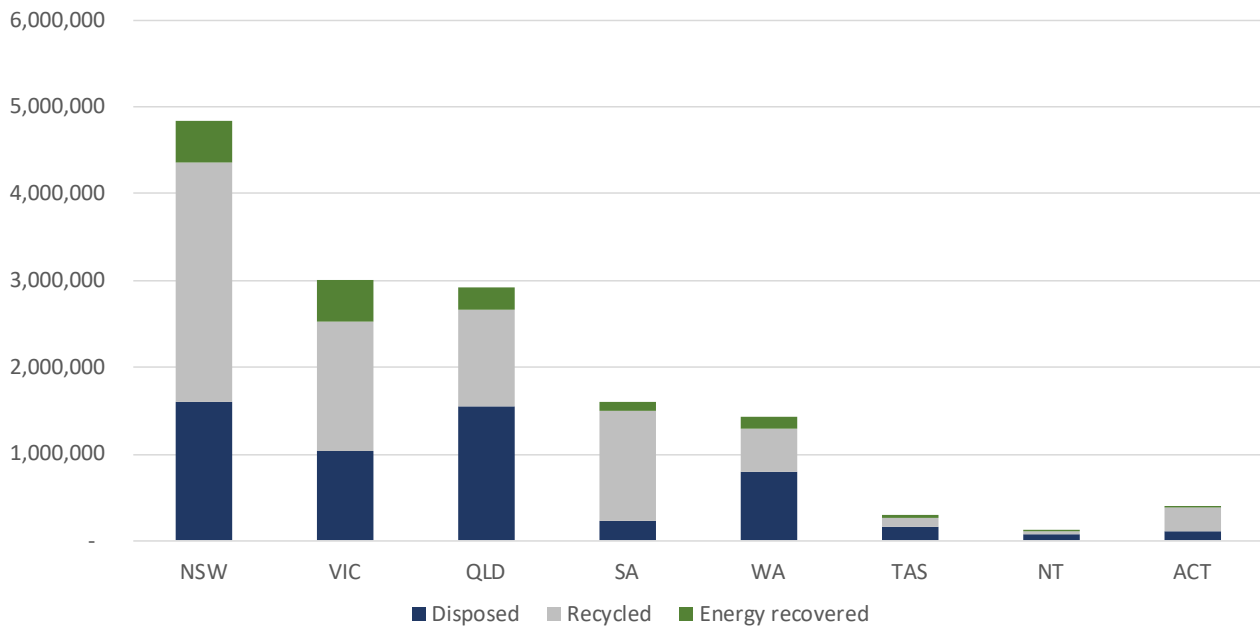


Source: National Waste Report, AEAS

2.4 Organics Recycling and Recovery Rates

In 2018-19 Australia produced 14.6 million tonnes of organic waste of which 5.6 million tonnes was sent to landfill, 7.5 million was recycled and 1.5 million tonnes recovered through energy. Australia’s overall organic material recycling rate was 51.5 per cent and the recovered rate was 61.9 per cent.

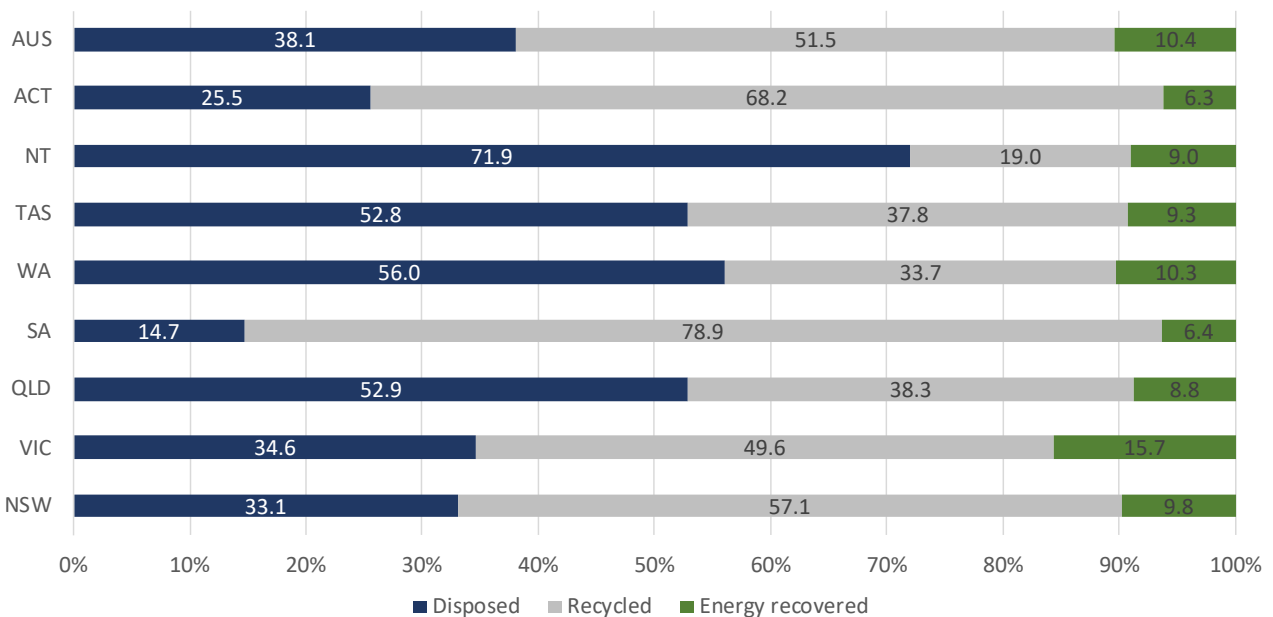
Figure 5: Organic material recycled & energy recovered in 2018-19 (tonnes)



Source: National Waste Report, AEAS

South Australia currently has the highest organics material recycling rate at 78.9 per cent, followed by the ACT (68.2%), NSW (57.1%), Victoria 49.6%, Queensland (38.3%) Tasmania (37.8%) and Western Australia (33.7%). The Northern Territory had the lowest organics recycling rate at 19 per cent in 2018-19.

Figure 6: Organic material recycled & energy recovered rates in 2018-19 (percentage of total)



Source: National Waste Report, AEAS

3.0 Economic and Environment Benefit Estimate Methodology

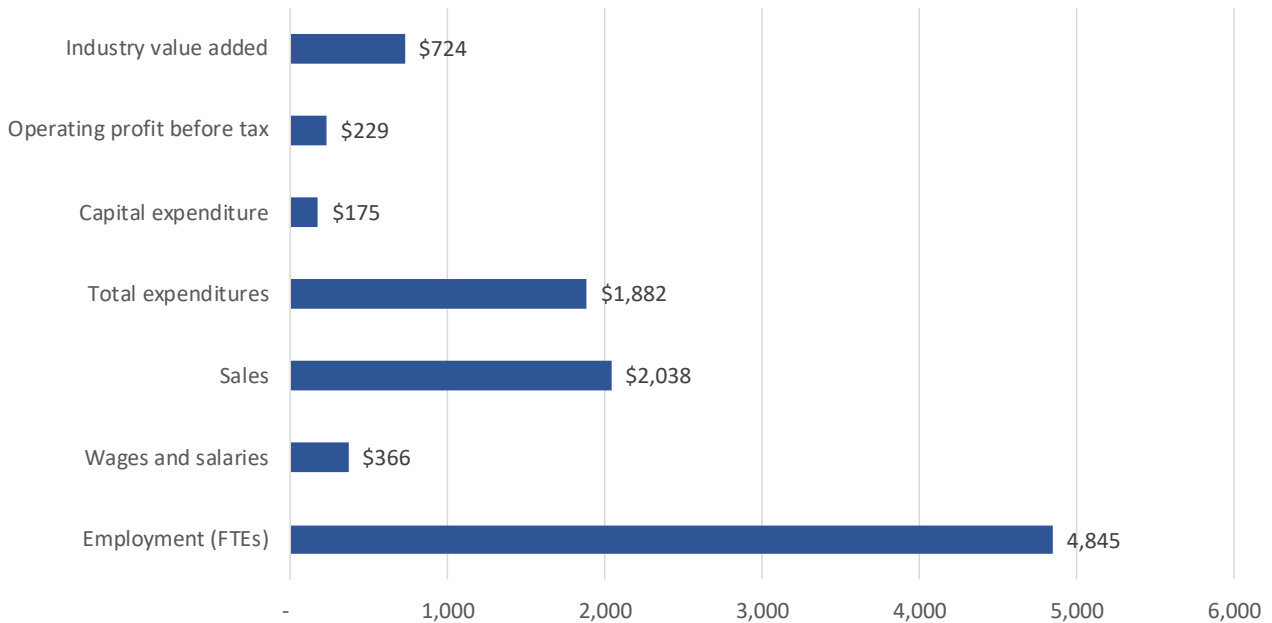
- 3.1 AEAS was commissioned by AORA (Australian Organics Recycling Association) to determine the economic benefit of the Australian Organics Recycling Industry (AORI) to the Australian and State economies based on analysis of existing data as referenced in Appendix One.
- 3.2 This report provides a detailed 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 2018; 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 2018 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 4,845 jobs to Australian residents, paying over a \$366 million in wages and salaries; providing a livelihood to each employee within the industry of \$75,540; has a collective industry turnover of over \$2 billion; sourcing \$1.9 billion across its supply chain, investing \$175 million in land, buildings, plant and equipment and vehicles each year and contributing \$724 million in industry value add to the Australian economy.

Figure 7: Contribution of Australian Organics Recycling Industry – 2018-19 key economic metrics (\$ millions)

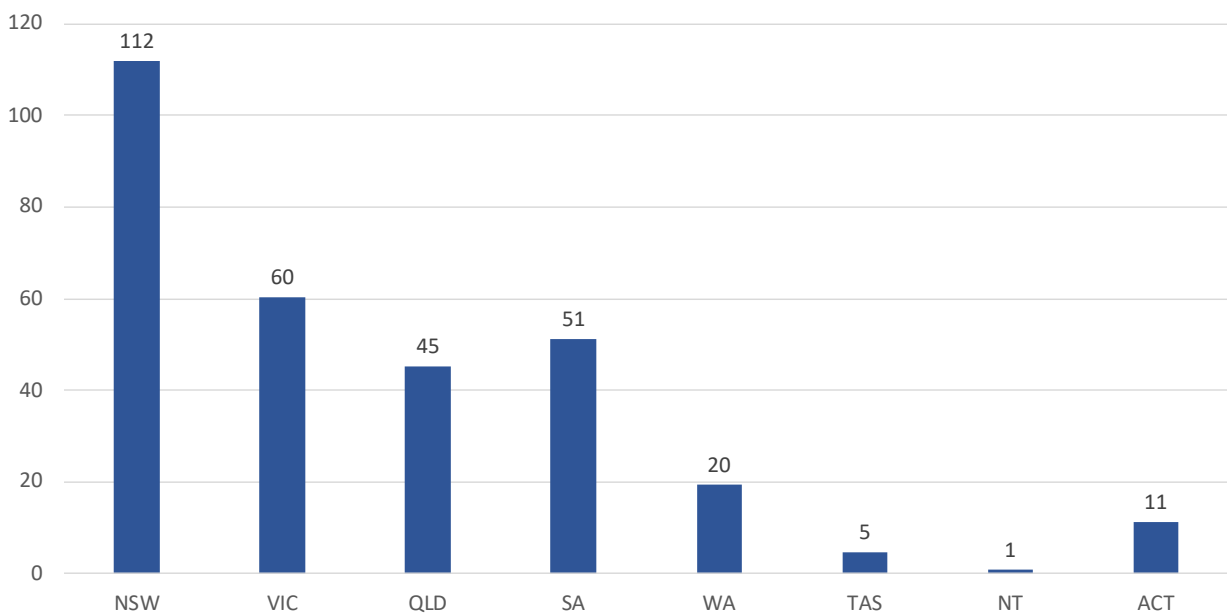


Source: AEAS

4.2 Number of Organic Recycling Businesses

In total there are 305 organic recycling businesses operating in Australia. NSW has 112 organic recycling businesses, Victoria has 60, Queensland 45, South Australia 51, Western Australia 20, Tasmania 5 the Northern Territory 1 and the ACT has 11* organic recycling businesses. The average size organic recycling employs 15.9 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 2018-19

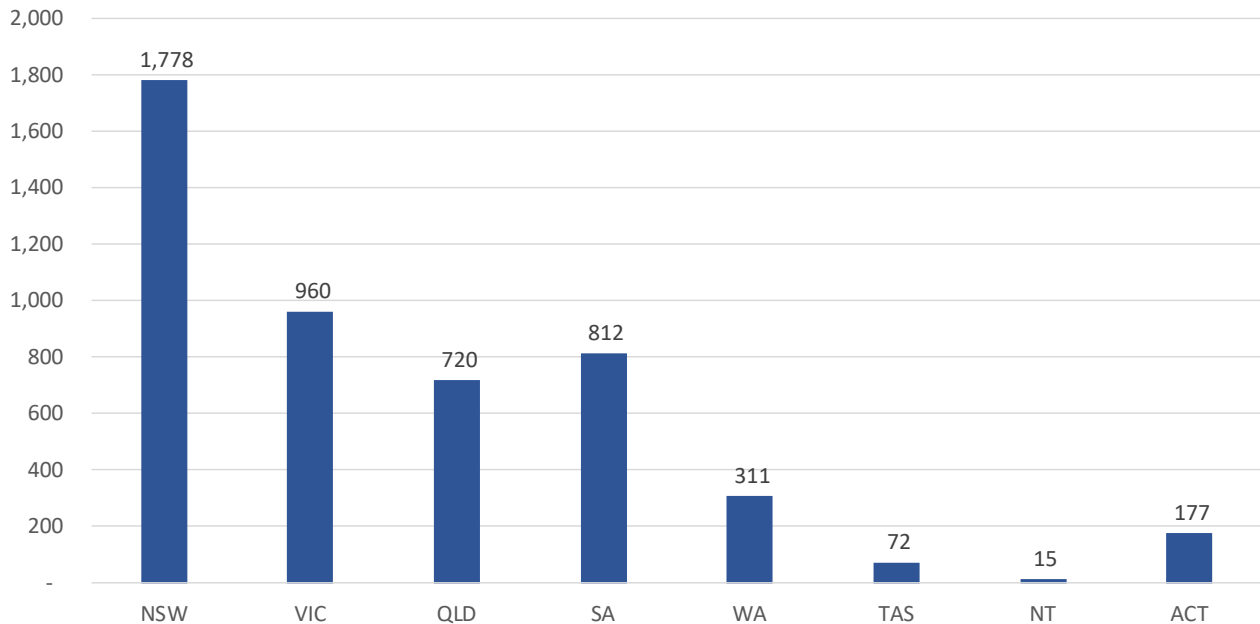


Source: AEAS. *Operating within or near the ACT

4.3 Industry Employment

The AORI is estimated to employ 4,845 Australians in 2018-19 with NSW organic recycling businesses employing 1,778, Victorian businesses employing 960 persons, Queensland employing 720 persons, South Australia employing 812 persons, Western Australia employing 311 persons and ACT employing 177 persons. Expressed alternatively one job is supported for every 1,550 tonnes of organic material recycled in Australia. AEAS estimates that a further 4,070 indirect jobs are provided through flow on activity.

Figure 9: Organics Recycling Industry Employment by State 2018-19 (FTEs)

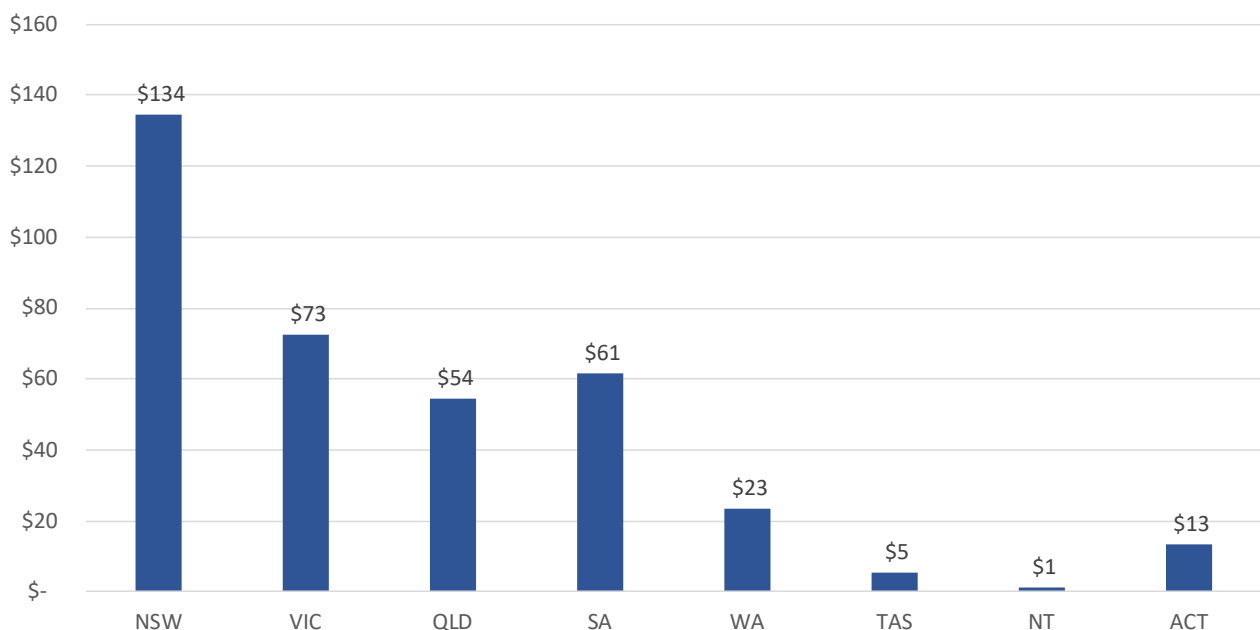


Source: AEAS

4.4 Wages and Salaries Paid to Australians

The AORI is estimated to provide over \$366 million in wages to Australians. NSW organic recycling businesses provide \$134 million in wages, Victorian businesses providing \$73 million, Queensland businesses providing \$54 million, South Australia providing \$61 million, Western Australia providing \$23 million and ACT providing \$13 million in wages. The average salary provided to each AORI employee is \$75,540 and compares to Australian average weekly earnings of \$64,390. In addition, AEAS estimates that an additional \$35 million was paid by organics recycling businesses towards employee superannuation.

Figure 10: Organics Recycling Industry Wages and Salaries by State 2018-19 (\$ millions)

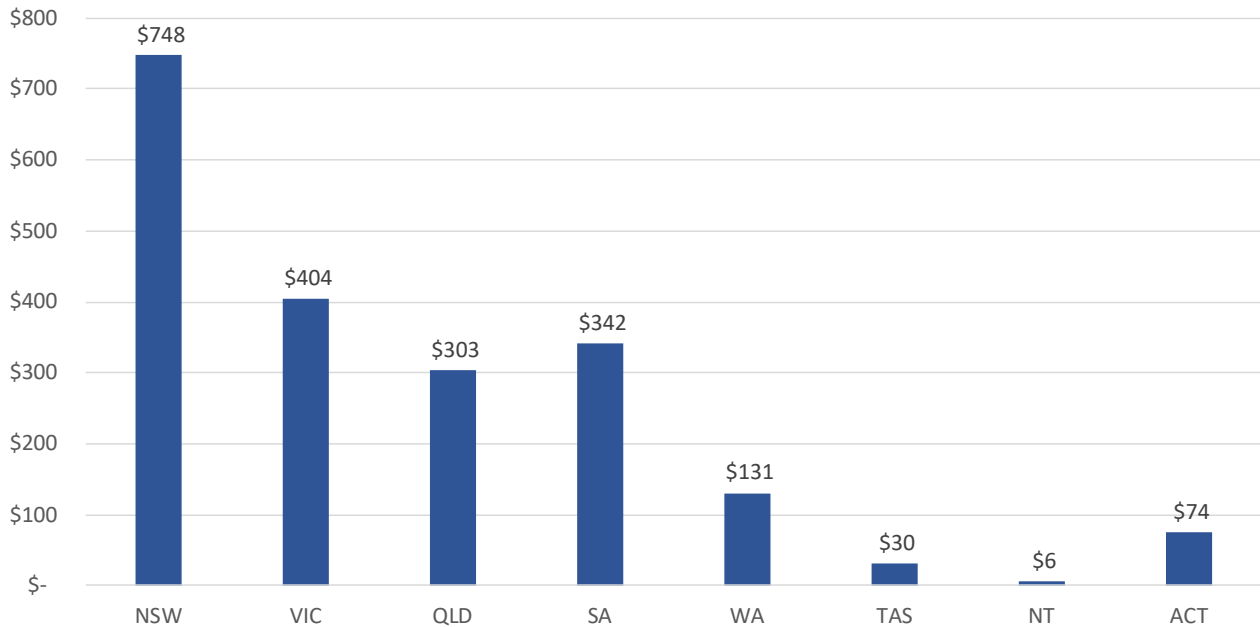


Source: AEAS

4.5 Industry Sales

Through the receipt of inputs and the sale of composted materials AORI earned over \$2 billion in sales (\$2,038 million) in 2018-19. NSW organic recycling businesses earned \$748 million in sales, Victorian businesses earned \$404 million, Queensland businesses earned \$303 million, South Australia earned \$342 million, Western Australia earned \$131 million and ACT organic recycling business earned \$74 million in sales. The average sales per organics recycling business was \$6.7 million in 2018-19. Expressed alternatively AORI turnover is estimated at \$271 per tonne of recycled organic material.

Figure 11: Organics Recycling Industry Turnover by State 2018-19 (\$ millions)

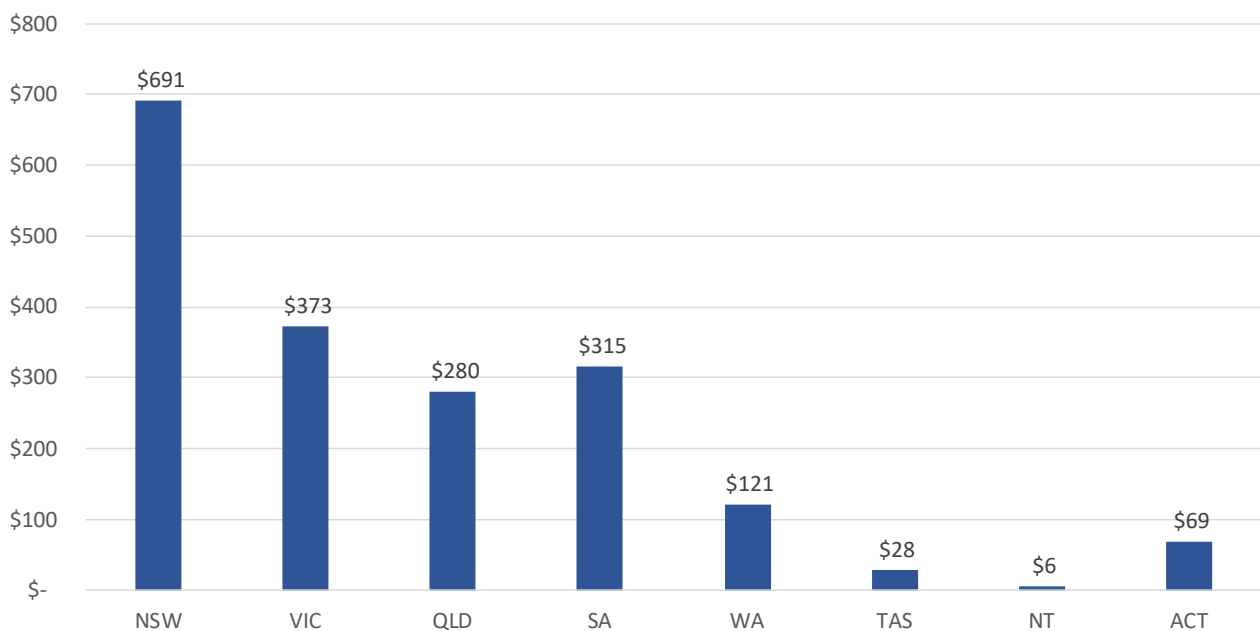


Source: AEAS

4.6 Supply Chain Expenditure

In 2018-19 Australian organics recycling businesses supported \$1.9 billion (\$1,882 million) of supply chain expenditure. NSW organic recycling businesses spent \$691 million in expenditure, Victorian businesses spent \$373 million, Queensland businesses spent \$280 million, South Australia spent \$315 million, Western Australia spent \$121 million and ACT organic recycling business spent \$69 million in expenditure. Each organics recycling business on average supported a \$6.2 million supply chain. Expressed alternatively AORI supply chain expenditure is estimated at \$250 per tonne of recycled organic material.

Figure 12: Organics Recycling Industry Supply Chain Expenditure by State 2018-19 (\$ millions)

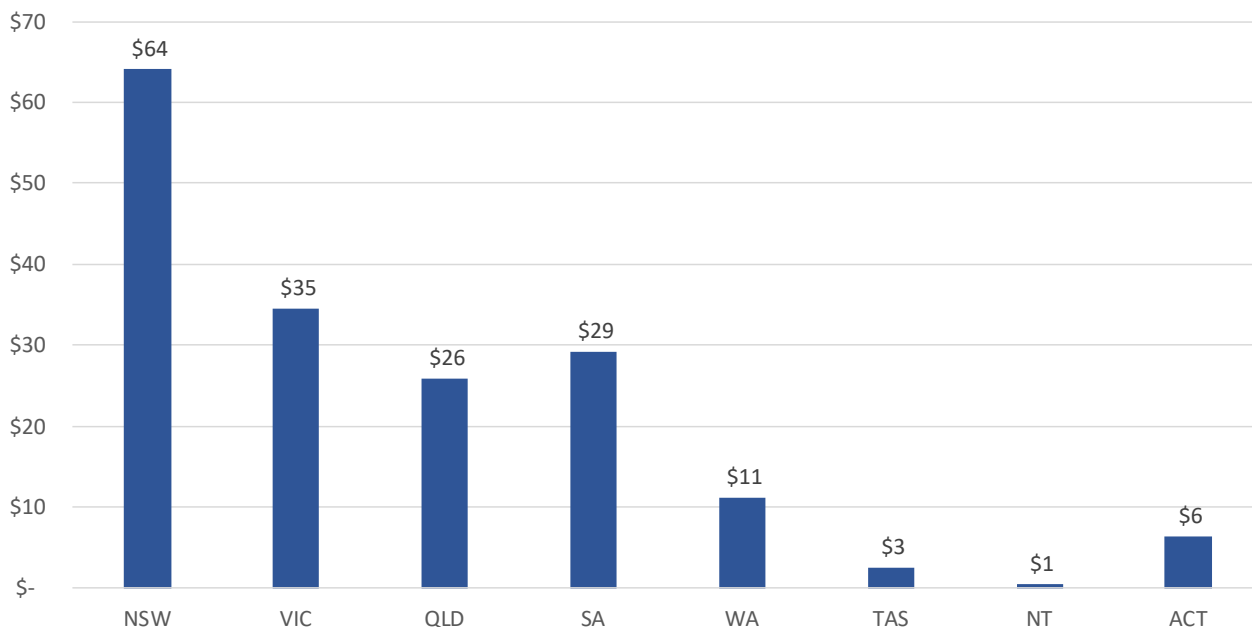


Source: AEAS

4.7 Capital Expenditure

The AORI invested approximately \$175 million in 2018-19 in land, buildings, plant and equipment, vehicles and other recycling infrastructure. NSW organic recycling businesses invested \$64 million, Victorian businesses invested \$35 million, Queensland businesses invested \$26 million, South Australia invested \$29 million, Western Australia invested \$11 million and ACT organic recycling business invested \$6 million in land, buildings, plant and equipment, vehicles and other recycling infrastructure. Each organics recycling business on average invested \$574,000 in land, buildings, plant and equipment, vehicles and other recycling infrastructure in 2018-19.

Figure 13: Organics Recycling Industry Capital Expenditure by State 2018-19 (\$ millions)

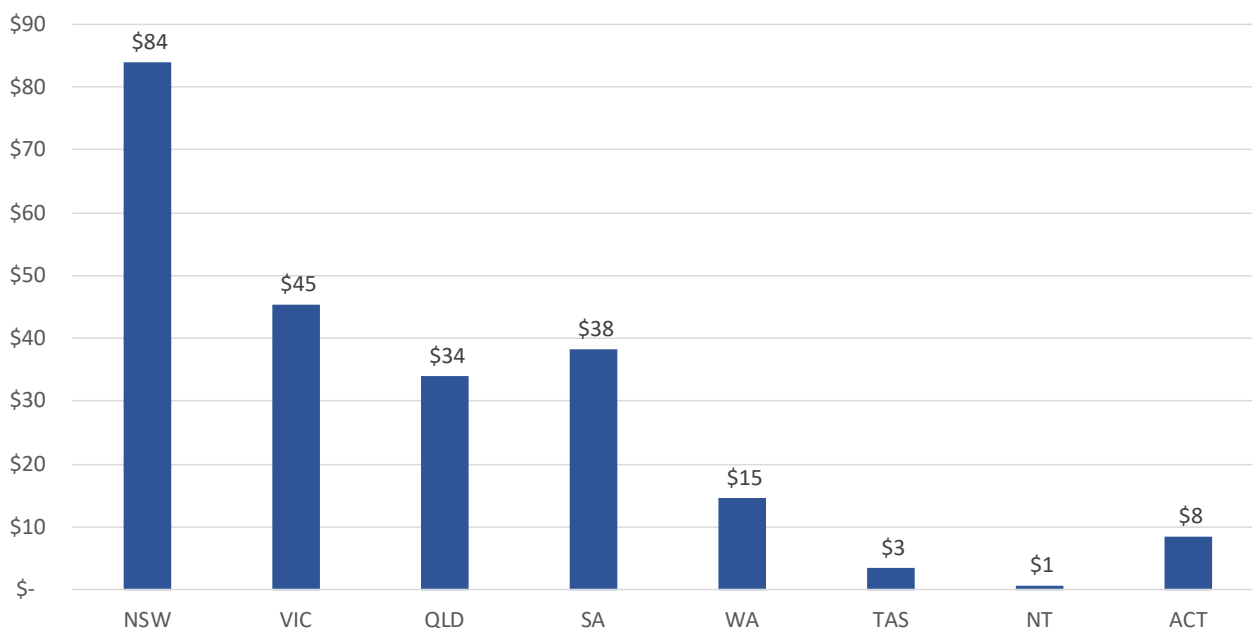


Source: AEAS

4.8 Industry Profits by State

Whilst AORI is characterised as a fledgling industry it is a profitable industry. AORI recycling businesses earned \$229 million operating profits before taxes. NSW organic recycling businesses earned \$84 million in profits, Victorian businesses earned \$45 million, Queensland businesses earned \$34 million, South Australia earned \$38 million, Western Australia earned \$15 million and ACT organic recycling business earned \$8 million in operating profits before taxes.

Figure 14: Organics Recycling Industry Operating Profit before Tax by State 2018-19 (\$ millions)



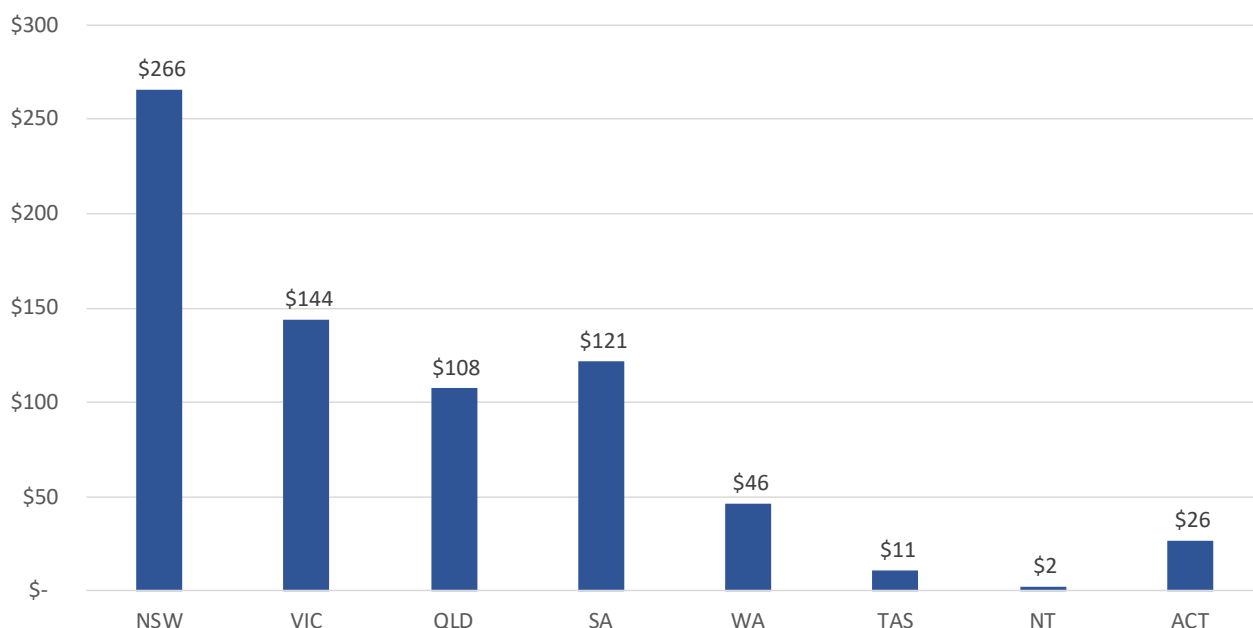
Source: AEAS

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 \$724 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 \$579 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 2018-19 (\$ millions)



Source: AEAS

4.10 Economic Summary – 2009-10 to 2018-19

A summary of the growth of AORI’s economic contribution since 2009-10 is provided in table 2 below.

Table 2 : Economic contribution to Australian Economy 2009-10 to 2018-19 (\$ millions – current prices)

	Employment at end of June	Wages and salaries	Sales	Expenditure	Capital expenditure	Operating profit before tax	Industry value added
2009-10	3,466	262	1,458	1,347	125	164	518
2010-11	3,534	267	1,487	1,373	127	167	528
2011-12	3,856	291	1,622	1,498	139	182	576
2012-13	4,270	323	1,796	1,659	154	202	638
2013-14	4,660	352	1,960	1,810	168	220	697
2014-15	4,799	363	2,019	1,864	173	227	717
2015-16	4,706	356	1,980	1,828	170	222	704
2016-17	4,703	356	1,978	1,827	170	222	703
2017-18	4,777	361	2,010	1,856	172	226	714
2018-19	4,845	366	2,038	1,882	175	229	724

Source: AEAS

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 2018-19 (\$ millions)

	Employment at end of June	Wages and salaries	Sales	Expenditure	Capital expenditure	Operating profit before tax	Industry value added
NSW	1,778	134	748	691	64	84	266
VIC	960	73	404	373	35	45	144
QLD	720	54	303	280	26	34	108
SA	812	61	342	315	29	38	121
WA	311	23	131	121	11	15	46
TAS	72	5	30	28	3	3	11
NT	15	1	6	6	1	1	2
ACT	177	13	74	69	6	8	26
AUS	4,845	366	2,038	1,882	175	229	724

Source: AEAS

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:

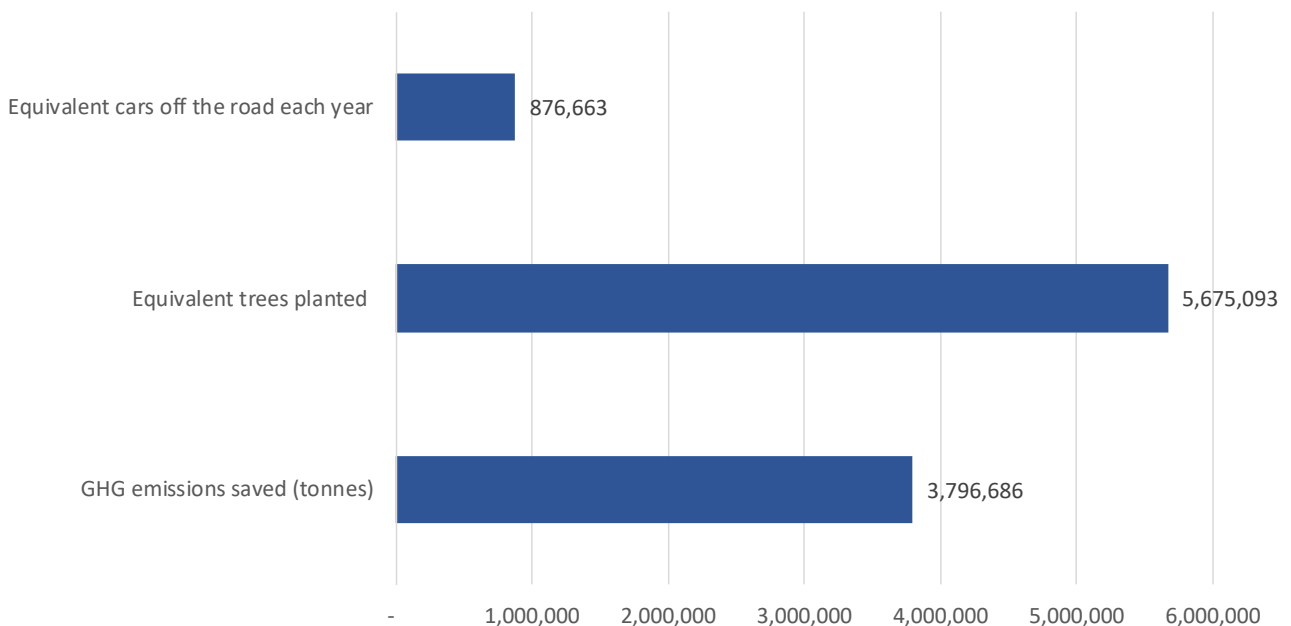
- Building soil carbon in agricultural soils. One tonne of composted garden organics applied to land can sequester approximately 0.5 tonnes of CO₂e (equivalent);
- Creating healthy soils that use less water, less fertiliser and fewer pesticides whilst reducing nutrient leaching and protecting the aquatic 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 2018-19 is approximately 3.8 million tonnes of CO₂-e. These GHG savings are considered approximately equivalent to:

- Approximately 5.7 million trees that would have to be planted to absorb the same amount of CO₂.
- The greenhouse gas emissions that 876,663 cars would produce in a year.

Figure 16: Australian Organics Recycling Industry - Environmental Benefits 2018-19



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 2018-19

	GHG emissions saved (tonnes)	Equivalent trees planted required for carbon absorption	Equivalent cars off the road each year
NSW	1,393,438	2,082,840	321,748
VIC	752,447	1,124,719	173,742
QLD	564,708	844,096	130,392
SA	636,229	951,003	146,907
WA	243,431	363,868	56,209
TAS	56,628	84,645	13,076
NT	11,290	16,876	2,607
ACT	138,516	207,046	31,984
AUS	3,796,686	5,675,093	876,663

Source: AEAS

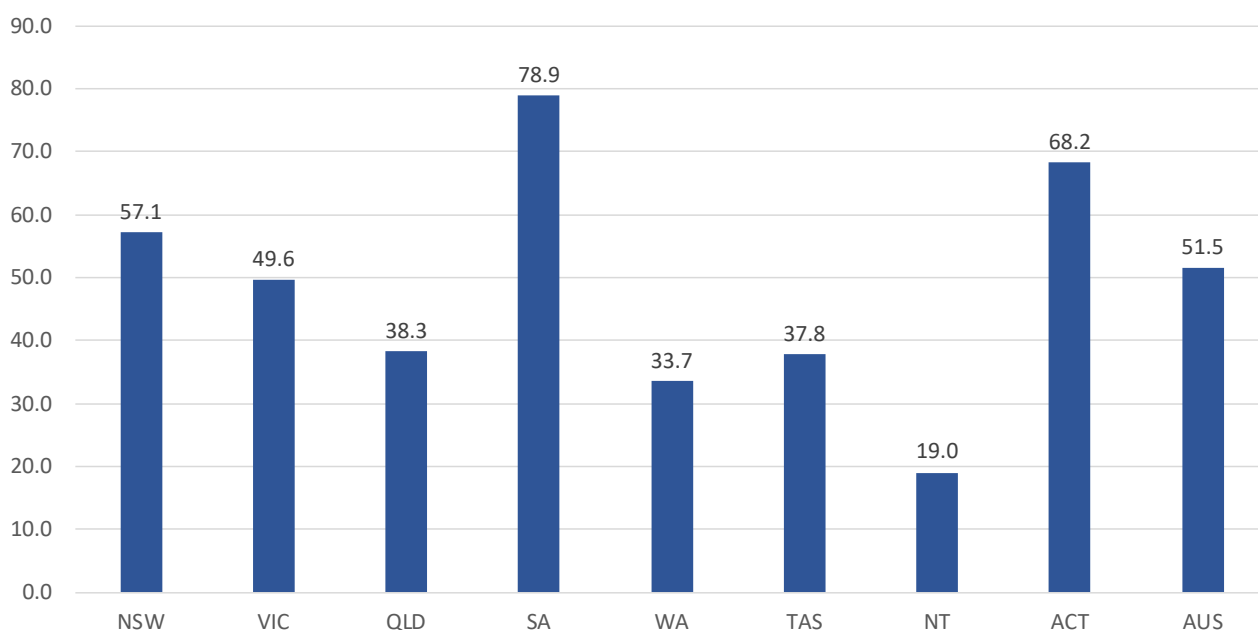
6.0 Modelling of increased Organics recycling rates

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 2018-19



Source: National Waste Report, AEAS

6.2 Scenario – No Change

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

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

	Employment at end of June (FTE)	Wages and salaries	Sales	Expenditure	Capital expenditure	Operating profit before tax	Industry value added
NSW	1,778	134	748	691	64	84	266
VIC	960	73	404	373	35	45	144
QLD	720	54	303	280	26	34	108
SA	812	61	342	315	29	38	121
WA	311	23	131	121	11	15	46
TAS	72	5	30	28	3	3	11
NT	15	1	6	6	1	1	2
ACT	177	13	74	69	6	8	26
AUS	4,845	366	2,038	1,882	175	229	724

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	1,393,438	2,082,840	321,748
VIC	752,447	1,124,719	173,742
QLD	564,708	844,096	130,392
SA	636,229	951,003	146,907
WA	243,431	363,868	56,209
TAS	56,628	84,645	13,076
NT	11,290	16,876	2,607
ACT	138,516	207,046	31,984
AUS	3,796,686	5,675,093	876,663

Source: AEAS

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 \$771 in sales providing an additional \$712 in supply chain opportunity with an extra \$274 million in industry value add towards the Australian economy.
- Organics recycling businesses would provide 1,834 extra jobs paying \$139 million in livelihood to everyday Australians.

Table 7: Economic contribution 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	2,180	165	917	847	79	103	326
VIC	1,355	102	570	526	49	64	203
QLD	1,318	100	554	512	48	62	197
SA	812	61	342	315	29	38	121
WA	646	49	272	251	23	30	97
TAS	134	10	56	52	5	6	20
NT	53	4	22	21	2	3	8
ACT	182	14	76	71	7	9	27
AUS	6,679	505	2,809	2,595	241	315	999

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	402	30	169	156	14	19	60
VIC	395	30	166	153	14	19	59
QLD	597	45	251	232	22	28	89
SA	0	0	0	0	0	0	0
WA	335	25	141	130	12	16	50
TAS	61	5	26	24	2	3	9
NT	39	3	16	15	1	2	6
ACT	5	0	2	2	0	0	1
AUS	1,834	139	771	712	66	87	274

Source: AEAS

If all Australian states were able to achieve 70 per cent recycling rate for organic material the Australian environment would benefit from an extra 1,436,829 tonnes of greenhouse gas emissions saved which is equivalent to:

- 2,149,011 trees planted; and
- 332,279 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	1,708,448	2,554,130	394,652
VIC	1,061,457	1,586,877	245,196
QLD	1,032,840	1,544,095	238,586
SA	636,229	951,162	146,969
WA	506,076	756,583	116,904
TAS	104,756	156,610	24,199
NT	41,500	62,043	9,587
ACT	142,210	212,604	32,850
AUS	5,233,515	7,824,104	1,208,942

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	315,010	471,290	72,904
VIC	309,010	462,158	71,455
QLD	468,132	699,999	108,194
SA	0	0	0
WA	262,645	392,716	60,695
TAS	48,128	71,965	11,123
NT	30,210	45,167	6,980
ACT	3,694	5,557	867
AUS	1,436,829	2,149,011	332,279

Source: AEAS

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 \$401 million in industry value add towards the Australian economy.
- Organics recycling businesses would provide 2,682 extra jobs paying \$203 million in livelihood to everyday Australians.

Table 11: Economic contribution 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	2,491	188	1,048	968	90	118	372
VIC	1,548	117	651	601	56	73	231
QLD	1,506	114	633	585	54	71	225
SA	823	62	346	320	30	39	123
WA	738	56	310	287	27	35	110
TAS	153	12	64	59	6	7	23
NT	61	5	26	24	2	3	9
ACT	207	16	87	81	7	10	31
AUS	7,527	569	3,166	2,924	271	356	1,125

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	713	54	300	277	26	34	107
VIC	588	44	247	228	21	28	88
QLD	785	59	330	305	28	37	117
SA	11	1	5	4	0	1	2
WA	427	32	180	166	15	20	64
TAS	80	6	34	31	3	4	12
NT	47	4	20	18	2	2	7
ACT	31	2	13	12	1	1	5
AUS	2,682	203	1,128	1,042	97	127	401

Source: AEAS

If all Australian states were able to achieve 80 per cent recycling rate for organic material the Australian environment would benefit from an extra 2,102,377 tonnes of greenhouse gas emissions saved which is equivalent to:

- 23,144,006 trees planted; and
- 486,021 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	1,952,512	2,919,006	451,030
VIC	1,213,093	1,813,574	280,225
QLD	1,180,388	1,764,680	272,670
SA	645,022	964,309	149,000
WA	578,372	864,667	133,604
TAS	119,721	178,982	27,655
NT	47,429	70,906	10,956
ACT	162,525	242,975	37,543
AUS	5,899,063	8,819,099	1,362,684

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	559,074	836,165	129,283
VIC	460,646	688,855	106,483
QLD	615,680	920,584	142,277
SA	8,793	13,306	2,094
WA	334,942	500,799	77,395
TAS	63,093	94,338	14,580
NT	36,139	54,030	8,349
ACT	24,010	35,929	5,560
AUS	2,102,377	3,144,006	486,021

Source: AEAS

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 \$542 million in industry value add towards the Australian economy.
- Organics recycling businesses would provide 3,624 extra jobs paying \$274 million in livelihood to everyday Australians.

Table 15: Economic contribution 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	2,802	212	1,179	1,089	101	132	419
VIC	1,742	132	733	677	63	82	260
QLD	1,695	128	713	658	61	80	253
SA	927	70	390	360	33	44	139
WA	830	63	349	323	30	39	124
TAS	172	13	72	67	6	8	26
NT	69	5	29	27	2	3	10
ACT	233	18	98	91	8	11	35
AUS	8,469	640	3,562	3,290	305	400	1,266

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	1,024	77	431	398	37	48	153
VIC	782	59	329	304	28	37	117
QLD	974	74	410	378	35	46	146
SA	114	9	48	44	4	5	17
WA	520	39	219	202	19	25	78
TAS	99	8	42	39	4	5	15
NT	54	4	23	21	2	3	8
ACT	57	4	24	22	2	3	8
AUS	3,624	274	1,524	1,408	131	171	542

Source: AEAS

If all Australian states were able to achieve 90 per cent recycling rate for organic material the Australian environment would benefit from an extra 2,839,760 tonnes of greenhouse gas emissions saved which is equivalent to:

- 4,246,394 trees planted; and
- 656,356 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	2,196,576	3,283,882	507,409
VIC	1,364,730	2,040,271	315,253
QLD	1,327,937	1,985,265	306,753
SA	725,650	1,084,847	167,625
WA	650,669	972,750	150,305
TAS	134,686	201,355	31,112
NT	53,357	79,769	12,326
ACT	182,841	273,347	42,236
AUS	6,636,446	9,921,487	1,533,019

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	803,138	1,201,041	185,661
VIC	612,283	915,552	141,511
QLD	763,229	1,141,169	176,361
SA	89,421	133,844	20,719
WA	407,238	608,882	94,096
TAS	78,058	116,711	18,037
NT	42,067	62,893	9,719
ACT	44,325	66,301	10,253
AUS	2,839,760	4,246,394	656,356

Source: AEAS

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 \$612 million in industry value add towards the Australian economy.
- Organics recycling businesses would provide 4,094 extra jobs paying \$309 million in livelihood to everyday Australians.

Table 19 : Economic contribution 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	2,959	224	1,245	1,149	107	140	442
VIC	1,838	139	773	714	66	87	275
QLD	1,788	135	752	695	64	84	267
SA	978	74	411	380	35	46	146
WA	876	66	369	340	32	41	131
TAS	181	14	76	70	7	9	27
NT	73	5	31	28	3	3	11
ACT	246	19	104	96	9	12	37
AUS	8,939	676	3,760	3,473	322	422	1,336

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	1,181	89	497	459	43	56	177
VIC	878	66	369	341	32	41	131
QLD	1,068	81	449	415	39	50	160
SA	166	13	70	64	6	8	25
WA	566	43	238	220	20	27	85
TAS	109	8	46	42	4	5	16
NT	58	4	24	23	2	3	9
ACT	69	5	29	27	3	3	10
AUS	4,094	309	1,722	1,590	148	193	612

Source: AEAS

If all Australian states were able to achieve 95 per cent recycling rate for organic material the Australian environment would benefit from an extra 3,208,451 tonnes of greenhouse gas emissions saved which is equivalent to:

- 4,797,587 trees planted; and
- 741,524 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	2,318,608	3,466,319	535,599
VIC	1,440,548	2,153,619	332,767
QLD	1,401,711	2,095,557	323,795
SA	765,964	1,145,116	176,938
WA	686,817	1,026,792	158,655
TAS	142,168	212,542	32,841
NT	56,321	84,201	13,010
ACT	192,999	288,533	44,583
AUS	7,005,137	10,472,680	1,618,187

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	925,170	1,383,479	213,851
VIC	688,101	1,028,900	159,025
QLD	837,003	1,251,461	193,403
SA	129,735	194,114	30,031
WA	443,387	662,924	102,446
TAS	85,540	127,897	19,765
NT	45,032	67,325	10,403
ACT	54,483	81,487	12,599
AUS	3,208,451	4,797,587	741,524

Source: AEAS

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, 2017-18

Australian Bureau of Statistics 8165.0 - Counts of Australian Businesses, including Entries and Exits, Jun 2013 to Jun 2017

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

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

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 Suncorp, Brisbane Airport Corporation, the Property Council of Australia, the Queensland Resources Council, Queensland Investment Corporation, Master Builders Australia, AI Group, CCIQ, Waste Recycling Industry Queensland, RACQ, VTA, HPC Urban, 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.

Contact Details:

Nick Behrens
Director
Australian Economic Advocacy Solutions
PO Box 847, Bulimba QLD 4171
Mobile 0448 034 355
nickbehrens@qeas.com.au
www.qeas.com.au
ABN 57028574915

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.

