

NORTH COAST REGION WASTE INVESTMENT REPORT

Waste and Infrastructure Stocktake - Final

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NORTH COAST REGION COUNCILS

North Coast Region Waste Investment Report

Waste and Infrastructure Stocktake - Final

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1 INTRODUCTION

The Councils of the NSW North Coast region are considering options to develop regional responses to collective waste challenges, including infrastructure to divert residual waste from landfill, to enhance recovery rates and to support the security and local opportunity of the recovered materials supply chain through to end markets.

The analysis encompasses the 13 Councils from MidCoast Council in the south through to the Queensland border. All sit within the Regional Levy Area (RLA).

The Councils have long been progressive in managing their waste and resource recovery. Collectively, the recovery rate for Municipal Solid Waste (MSW) in the North Coast was 57% in 2018/19, well above the NSW-wide rate of 42% for MSW in 2017/18¹. North Coast Councils were among the first to move to co-collection of food organics and garden organics (FOGO) and were early adopters of alternative waste treatment (AWT) for residual waste.

The Waste and Infrastructure Stocktake Report has captured the current status and background, along with a projection of MSW generation under business as usual. The prime focus of the analysis is MSW, given local government's primary responsibility and influence in managing community-generated waste streams.

However, it includes a high level assessment of the commercial and industrial (C&I) waste and construction and demolition (C&D) waste context across the region, including key facilities, flows and indicative end markets. These streams are typically managed by the private sector, but they often rely on council waste facilities and represent additional potential feedstocks for new developments.

MSW generation in the region fluctuates, with at times significant variations year-on-year across all streams, but average North Coast per capita generation in 2018-19 of 510 kg per annum is slightly lower than the NSW average of 530 kg.

In 2018-19, total MSW generation in the region (all streams) was 339,000 tonnes. Under conservative baseline assumptions, it is projected to reach 373,000 tonnes by 2039-40, a 10% increase over 20 years. Further detail is provided on the overall region, the two major sub-regions and each Council.

A summary of key conclusions from the data analysis and consultation is provided in Section 7. The Stocktake Report and associated waste flows model (provided under separate cover) will be presented to Councils at a workshop that will provide an opportunity to validate and refine the data, assumptions and broader information on waste flows and facility capacities. The report will also inform discussion at the workshop of future needs and opportunities for waste, recycling and reprocessing infrastructure in the region.

¹ Waste Avoidance and Resource Recovery Strategy Progress Report 2017-18, NSW EPA

2 DATA

2.1 Data sources

This regional data stocktake is based on the best available data from a number of sources with heavy reliance on data provided by participating councils, either directly to Arcadis or through historic reporting to NSW EPA and the regional groups. [This draft version of the report and the attached waste flow model provides an opportunity for each council to check and confirm that their data is accurately reflected]

Key data sources are as follows:

- Historic waste flows and volumes are based on WARR survey data that has been reported by each council to NSW EPA over the past 10 years. This data covers all the major municipal waste streams and is in a relatively consistent format to facilitate comparison and consolidation. That said, the survey by EPA has changed over that period, as has the quality of data collected by each Council. Upon review, it was apparent that the WARR survey for the 2010-11 year and earlier years was very different to the current survey and it was difficult to compare the data. As such, analysis of historic trends has focused on the period 2011-12 to 2018-19.
- Arcadis surveyed each Council to collect data on waste facilities within their region, as well as other aspects such as costs, contracts and end destinations for each stream and future plans.
- Information on private sector activities and facilities was obtained through a combination of Council intelligence and direct consultation with the primary private sector operators in the region.
- Waste compositions for municipal streams are based on the most recent available waste audit datasets for each Council, which were mostly provided via the regional groups.

2.2 Data quality

The quality of data is generally quite good and has likely improved over time, such that more recent data is likely to be most accurate. However, there are variations and anomalies that are not readily explained and may be down to data quality or data interpretation issues.

There were occasions where there was clearly an anomalous result or a gap in a given year (e.g. zero drop-off waste tonnage reported in one year when all previous years had a figure entered). In such cases where there was an obvious gap or error, Arcadis has made amendments to avoid skewing the baseline tonnages.

Key gaps and weaknesses in the data include:

- C&I and C&D waste flow and composition data is limited. EPA collects data from these sectors but
 only publishes total volumes aggregated at the state-wide level. The consultation with local
 industry mostly only gleaned qualitative insights, rather than quantitative data. As such, this report
 focuses primarily on the MSW stream. Compositional data for these streams is not available if it
 is held by the private sector, they are generally not willing to share it.
- Data gaps and potential differences in the way that MSW data is entered into the EPA WARR survey or in the interpretation of the questions. For example, for Councils that send waste to AWT, there is significant variation between them in the apparent recovery rate of the AWT facility and it is unclear whether this is a data quality issue or reflective of genuine fluctuations in the performance of the facility (potentially both). It is also possible that some Councils are reporting actual recovery through the AWT, while others are reporting inputs to the AWT.

2.3 Key assumptions

A range of key assumptions underpin the waste flow model and future projections, including both key modelling factors and informed estimates where the data is weak. The waste flow model has been provided under separate cover, but to ensure transparency, all material assumptions are discussed below.

At this stage, Arcadis has developed simple future projections under a business-as-usual (BAU) case only. Alternative scenarios will be explored in the next phase. BAU has been defined as no change in current systems and facilities, so that current recovery performance is maintained. It is acknowledged that this will not necessarily be the case (e.g. AWT is currently very uncertain in NSW and the longerterm future of the Coffs AWT facility is unknown), but it provides a baseline against which alternative options can be compared.

Future waste projections are discussed further in Section 3.3.3, but Arcadis has reviewed recent historic trends in municipal waste generation and conservatively modelled the business-as-usual (BAU) waste generation projections. Given there has been fluctuation in waste generation (total and per capita) and recovery performance for some Councils, Arcadis has taken an average of waste volumes over the past three years (2016-17 through to 2018-19) as a baseline to remove those fluctuations. Where it is known that there has been a significant change in services during that period for a particular Council, such as introduction of FOGO, then this has been amended (e.g. average over two years only).

The BAU model projections also assume no change in per capita generation into the future, meaning waste volumes grow only in line with population within each LGA. This may result in conservatively high estimates in that there is some evidence at a state-wide and national level to suggest that waste generation may be declining on a per capita basis, but that is not yet evident in this region. The model is flexible and allows for alternative waste generation assumptions, including a changing profile over time (e.g. declining for a period then plateauing).

Also, AWT recovery has been retained in the BAU forecast at this stage due to the uncertainty about the ability to reconfigure the facility to retain the current contracts and recovery rates. This is a conservative assumption and different options can be tested in subsequent stages.

The waste flow model provides detailed data for each council but also aggregates those volumes according to the two regional groups (NEWaste and Mid-Waste), as well as for the region as a whole.

3 REGIONAL ANALYSIS

Municipal solid waste is managed at a local government scale, with councils responsible for guaranteeing waste collection services and safe disposal, together with aspirations for resource recovery. However, the councils of the NSW North Coast have long understood that regional collaboration is required to create the scale and certainty required to underpin investment in large scale waste infrastructure.

In addition, C&I waste and C&D waste are not subject to jurisdictional boundaries but are typically transported to least cost outcomes in a dynamic market. As a result, these streams represent opportunities to top up MSW volumes to support the business case for new infrastructure.

This section provides a stocktake of waste flows and existing infrastructure in the greater North Coast region. It is built up from the individual council profiles in Section 5 to provide a regional assessment of available waste volumes and existing infrastructure. It includes at regional scale:

- Current and projected overall regional volumes (by waste stream)
- Resource recovery profile, including overall recovery rate and breakdown by stream / material, with key differences between councils highlighted
- The composition of the waste streams to identify opportunities to improve conventional recovery performance and the calorific value of the residual stream to support EfW
- Map and list of existing waste and recovery facilities, by type
- List of existing offtakes / end markets for relevant streams
- Table of contract expiry dates for processing/disposal contracts (major MSW streams), and diagram for each stream indicating tonnages as they become available to the market at contract expiry.

3.1 North Coast region profile

3.1.1 Regional overview

The NSW North Coast region in scope for this analysis constitutes 13 local governments that stretch 650 km from MidCoast Council in the south to the Queensland border (Figure 1). With a population of 606,754 people, the region houses 8% of the NSW population and makes up 5.2% of the land area.

All Councils are within the Regional Levy Area (RLA), which provides a consistent price signal across the region in support of new resource recovery infrastructure. The levy was \$81.30 per tonne in the 2018-19 base year for the analysis (currently \$82.70 per tonne).



Figure 1: LGA boundaries for the 13 councils involved in the study

The region has a relatively low average population density of 14.4 people per km² compared to the NSW average of 100 people per km², although this varies significantly. Table 1 summarises the populations and approximate land areas of each LGA, highlighting the variations in scale and settlement density.

The four largest LGAs – Tweed, MidCoast, Port Macquarie and Coffs Harbour – account for approximately 56% of the region's total population but only 29% of the land area, in most cases due to significantly higher density.

The distribution of the region's population is weighted towards the southern end of the study area, with Tweed being the only council among the biggest four LGAs outside this zone.

Local government area	Population (2016) ²	Population % of total	Land Area (Km²)	Land Area % of total	Density (Persons / km²)
Ballina	42,993	7.09%	485	1.15%	88.65
Bellingen	12,951	2.13%	1,602	3.80%	8.08
Byron	33,399	5.50%	567	1.35%	58.90
Clarence	51,622	8.51%	10,441	24.78%	4.94
Coffs Harbour	74,670	12.31%	1,175	2.79%	63.66
Kempsey	29,431	4.85%	3,381	8.03%	8.70
Kyogle	9,114	1.50%	3,589	8.52%	2.54
Lismore	44,122	7.27%	1,290	3.06%	34.20
MidCoast	91,801	15.13%	10,060	23.88%	9.13
Nambucca	19,580	3.23%	1,491	3.54%	13.13
РМНС	80,073	13.20%	3,686	8.75%	21.72
Richmond	23,256	3.83%	3,051	7.24%	7.62
Tweed	93,742	15.45%	1,309	3.11%	71.61
Total	606,754	100%	42,127	100%	14.43

Table 1: Summary of region populations and land areas

² https://www.planning.nsw.gov.au/Research-and-Demography/Population-projections/Projections

3.1.2 Population projections

Given residents are the key generators of MSW (other than council-generated wastes), population growth is a close correlate to future waste generation. The region is experiencing moderate population growth, with an average growth rate of +1.2% each year from 2001 to 2016³. This is forecast to continue over the analysis period, although it is not uniform across the region (Figure 2).

The four largest LGAs are projected to experience the highest growth and will remain the most populous for the forecast period. The other North Coast LGAs are projected to remain stable or slightly reduce in population.



Figure 2 Projected population growth by LGA, NSW 2019⁴

3.2 Current services

Table 2 summarises the MSW kerbside services across the region. All councils other than Kyogle have a three-bin system, although others such as Ballina have some variation based on urban versus rural properties. All councils have an organic service that includes Food Organics and Garden Organics (FOGO), except for MidCoast, which only allows Garden Organics (GO), and Kyogle as they do not have an organics service. Recent changes include Tweed introducing a third bin in 2017/18 and Kempsey moving to a weekly green bin and fortnightly red bin collection in mid-2017. In addition to the services outlined in Table 2, some councils offer additional services or a reduced offering for example for rural properties.

³ North Coast Regional Plan 2036, NSW Government Planning and Environment

⁴ ASGS 2019 LGA Projections

Table 2: Waste services in the region

Council	Residual Waste		Dry Recycling			Organics				
	Bin Size	Frequency	Kg/hh/wk	Bin Size	Frequency	Kg/hh/wk	Service	Bin Size	Frequency	Kg/hh/wk
Ballina	240L	F/N	8.31	240L	F/N	5.42	FOGO	240L	Weekly	8.39
Bellingen	240L	F/N	6.30	240L	F/N	5.06	FOGO	240L	Weekly	7.09
Byron	140L	F/N	6.17	240L	F/N	6.71	FOGO	240L	Weekly	8.99
Clarence Valley	240L	F/N	6.76	360L	F/N	5.89	FOGO	240L	Weekly	8.39
Coffs Harbour	240L	F/N	8.45	240L	F/N	5.49	FOGO	240L	Weekly	7.30
Kempsey	140L	F/N	7.62	240L	F/N	5.00	FOGO	240L	Weekly	6.28
Kyogle	240 Split	Weekly	9.48	240L Split	Weekly	4.16	-	-	-	-
Lismore	140L	F/N	7.11	240L	F/N	7.51	FOGO	240L	Weekly	8.92
MidCoast	140L	Weekly	8.33	240L	F/N	5.13	GO	240L	F/N	4.08
Nambucca	240L	F/N	7.82	240L	F/N	5.41	FOGO	240L	Weekly	7.00
РМНС	240L	F/N	6.85	240L	F/N	5.61	FOGO	240L	Weekly	8.54
Richmond Valley	240L	F/N	7.13	240L	F/N	5.84	FOGO	240L	Weekly	8.23
Tweed	140L	F/N	7.42	240L	F/N	6.11	FOGO	240L	Weekly	9.52

3.3 Waste generation

3.3.1 Current MSW generation

In 2018/19, almost 339,000 tonnes of MSW was generated across the region of which 57% was recovered. Of that volume, around 70% was collected through regular kerbside systems (3 bins for most councils in the region) while the remainder was mostly collected through drop-off (at transfer stations) or clean-up services.

Overall, 25% of domestic waste was commingled recycling and another 31% was recovered organics; 3% of the regional waste was recovered through AWT (although that only applies to a small number of councils); and 40% was disposed to landfill. This excludes containers separately collected through the Exchange for Change container deposit scheme introduced in December 2017 but includes any eligible containers that are still collected through the kerbside.

Table 3 shows the breakdown of MSW generated by the major streams within the region in 2018-19 (there are some minor streams not shown because the volumes are small or the data incomplete). Table 4 following shows the total recycling, organics and residual tonnages by council as well as overall recovery rates. Figure 3 presents an overview of historic and projected waste flows, aggregated by major streams.



Figure 3: Summary of regional MSW generation by major streams – historic and future projections (BAU)

At a sub-regional level, Figure 4 and Figure 5 below present the historic and future BAU waste flows for the established regional waste groups (NEWaste and MidWaste) that make up the North Coast region. Where full regional solutions are unlikely to be viable due to transport distances, it may be necessary to consider future opportunities at regional waste group or some other sub-regional scale.

MidWaste generates more waste, while the two groups have comparable resource recovery rates, particularly if the AWT recovery from processing of residual waste at the Coffs Harbour MBT facility is

removed to reflect the current challenge posed by the 2018 rescission of the exemption allowing land application of mixed waste organics outputs (MWOO).



Figure 4: Summary of NEWaste region MSW generation by major streams - historic and future projections (BAU)



Figure 5: Summary of MidWaste MSW generation by major streams – historic and future projections (BAU)

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Table 3: Breakdown of headline domestic waste streams 2018-19 (tonnes)

Council	Kerbside recycling (recovered)	Drop-off recycling (recovered)	Kerbside organics (GO+FOGO)	Drop off Organics	AWT recovery	Total recovery residuals disposed	Kerbside residual waste to Iandfill	Drop-off residual waste to landfill	Clean-up waste disposed	Total
Ballina	4,315	1,718	4,365	0	0	0	6,921	1,939	0	19,258
Byron	5,477	1,751	5,055	3,389	0	6	5,416	4,524	0	25,618
Clarence Valley	5,052	3,068	6,983	1,097	0	193	7,607	4,545	848	29,393
Kyogle	378	880	0	166	0	0	931	1,037	0	3,392
Lismore	3,150	10,356	4,843	1,875	0	0	5,707	4,755	0	30,686
Richmond Valley	1,220	864	2,828	206	0	0	3,040	1,340	0	9,498
Tweed	9,044	0	12,013	3,970	0	822	14,775	4,494	1,129	46,247
Bellingen	962	0	1,495	0	640	103	748	0	111	4,059
Coffs Harbour	7,015	5,038	10,540	1,594	433	1,097	12,529	0	909	39,155
Kempsey	2,024	1,706	3,439	349	321	263	4,591	2,159	0	14,852
MidCoast	6,507	5,868	9,758	3,777	0	2,781	19,994	5,680	1,250	55,615
Nambucca	1,562	1,149	2,708	209	1,776	82	105	59	50	7,700
Port Macquarie- Hastings	8,223	5,174	14,398	2,800	0	2,695	10,578	9,217	100	53,185
Total North Coast Region	54,929	37,572	78,425	19,432	3,170	8,042	92,942	39,749	4,397	338,658
Proportion of total generation	16%	11%	23%	6%	1%	2%	27%	12%	1%	100%

Council	Total recycling	Total organics recovered	AWT recovery	Total recovery	Total residual to landfill	Total domestic waste generation	Overall domestic recycling rate (WARR)
Ballina	6,033	4,365	0	10,398	8,860	19,258	54%
Byron	7,228	8,444	0	15,672	9,946	25,618	61%
Clarence Valley	8,120	8,080	0	16,200	13,193	29,393	55%
Kyogle	1,258	166	0	1,424	1,968	3,392	42%
Lismore	13,506	6,718	0	20,224	10,462	30,686	66%
Richmond Valley	2,084	3,034	0	5,118	4,380	9,498	54%
Tweed	9,044	15,983	0	25,027	21,220	46,247	54%
Bellingen	962	1,495	640	3,097	962	4,059	76%
Coffs Harbour	12,053	12,134	433	24,620	14,535	39,155	63%
Kempsey	3,730	3,788	321	7,839	7,013	14,852	53%
MidCoast	12,375	13,535	0	25,910	29,705	55,615	47%
Nambucca	2,711	2,917	1776	7,404	296	7,700	96%
Port Macquarie-Hastings	13,397	17,198	0	30,595	22,590	53,185	58%
Total North Coast Region	92,501	97,857	3,170	193,528	145,130	338,658	57%

Table 4: Summary of domestic waste generation and recovery by council 2018-19 (tonnes)

Figure 6 shows the per capita generation rates for each council over the three years from 2015-16 to 2017-18 compared with state-wide average values for the same period. Table 5 details the current (2018-19) MSW generation per capita for each council and for the region as a whole (calculated from tonnage and population data, not extracted from WARR survey).

The average MSW generation rate for the North Coast region has typically been slightly higher than the state average. There is a reasonable degree of variation between councils in the region and significant fluctuation year-on-year for some councils as discussed further below (Section 3.3.2). Some councils such as Bellingen and Nambucca are consistently lower than others and lower than the state average, whereas councils such as Byron, MidCoast and Port Macquarie-Hastings are consistently higher. It is important to note many influences can impact waste generation, such as seasonal fluctuations based on tourism, especially for regions such as Byron and Ballina, in addition to extreme weather events, such as floods, which may skew the data.



Figure 6: MSW generation per capita by council 2015-16 to 2017-18

Council	MSW generation (kg per capita per annum)	MSW generation (kg per capita per week)
Ballina	433	8.3
Byron	735	14.1
Clarence Valley	568	10.9
Kyogle	385	7.4
Lismore	694	13.3
Richmond Valley	405	7.8
Tweed	475	9.1
Bellingen	313	6.0
Coffs Harbour	506	9.7
Kempsey	501	9.6
MidCoast	592	11.4
Nambucca	388	7.5
Port Macquarie-Hastings	632	12.2
Region Average	510	10.0
NSW Average 2017-18 ⁵	530	10.2

Table 5: Benchmarking of MSW generation across the region (2018-19)

3.3.2 Waste generation trends

Waste generation is a function of many factors, many of which are difficult to quantify and predict with any accuracy. However, the overwhelming major factor for MSW is population growth, which underpins an inherent assumption that MSW generation will increase as the population grows. In order to assess whether the volume of waste generated by each resident is changing, this section looks at recent trends in per capita waste generation.

Figure 7 below shows the annual MSW generation per person since 2010-11, noting that there were significant anomalies in the earlier data obtained by Arcadis. The trends across the North Coast and two sub-regions are largely consistent, declining until 2012-13, then steadily increasing to 2016-17, followed by a sharp drop in 2017-18.

The state-wide trend in per capita MSW generation was somewhat different in the first part of this period and there was a sharp drop from 2014-15 to 2015-16, although EPA acknowledged that data reporting and analysis methods changed in this period and might account for the sudden shift. In any case, the state-wide level came down to be more consistent with longer term rates for the North Coast region.

⁵ Waste Avoidance and Resource Recovery Strategy Progress Report 2017-18

Figure 8 below shows these trends as annual changes (growth and decline) in percentage terms in the per capita waste generation rate for the total North Coast region and two sub-regions. Overall, there is no clear growth or declining trend over the past 8 years of data.

There are many potential reasons for these fluctuations, including improvements in the quality and completeness of datasets over time. Certainly, the scope and level of detail in the local government annual survey has expanded over this period and it is likely that council data systems have improved in response to increasing data demands from EPA, including monthly levy reporting.



Figure 7: Annual total MSW generation per capita trends by region



Figure 8: Annual change in total MSW generation per capita by sub-region

For garden organics, which is a significant component of MSW, there are definite seasonal and climatic influences – a particularly dry or wet year will influence the generation of garden organics, as will major storm events in a given year. However, the trends above, particularly the sharp drop in 2017-18 across the region, seem to be influenced by a number of waste streams, not just the expected fluctuation in garden organics.

3.3.3 Future waste generation

Overall, it is difficult to identify any emerging trends in waste generation across the region given the year-on-year fluctuations at a regional and local scale. For the moment, Arcadis has conservatively modelled the business-as-usual (BAU) waste generation projections by:

- Taking an average of waste volumes over the past three years (2016-17 through to 2018-19) as a baseline to remove any fluctuations (note an average of two years has been taken where a significant change has occurred in that period, such as introduction of FOGO), and
- Assuming no change in per capita generation into the future, i.e. waste volumes grow only in line with population within each LGA.

This is considered conservative in that there is evidence to suggest that waste generation may be declining on a per capita basis, supported by recent state-wide and national trends. In Phase 2 of the study, alternative scenarios will be modelled to test the impact of different assumptions around future waste generation and recovery rates.

Councils, and state governments for that matter, have limited capacity to influence the amount of waste that residents generate within their homes other than through education programs to support better waste avoidance behaviours. However, a number of broader macro trends are emerging that are likely to have an impact on household waste generation, with potential to lead to a future reduction:

• Growing awareness and interest amongst the community around the environmental and health impacts of waste and the need to minimise waste generation

- Ongoing improvements and efficiencies in packaging, including reduced incidence of single use and disposable packaging (in line with national commitments to make all packaging reusable, recyclable or compostable)
- Reductions in household food waste through consumer education and improved lifespan of food products, as well as growth in home composting
- Trends towards outsourcing the preparation of meals to third parties through the growth in home delivery services
- Increasing activation of circular economy business models, such as repairable and reusable products, returnable packaging (e.g. current trials in food delivery and coffee cup exchanges) and packaging-free bulk grocery stores.

Figure 9 shows the relative total domestic waste generation by each council since 2011-12 and forecast into the future, based on the zero per capita growth rate assumption. Total MSW generation in the region (all streams) is estimated to reach 373,000 tonnes by 2039-40, a 10% increase on the 339,000 tonnes in 2018-19.



Figure 9: Total domestic waste generation - historic and projected by council

	2014-15	2019-20	2024-25	2029-30	2034-35	2039-40
Ballina	25,552	21,248	21,454	21,897	22,204	22,358
Byron	24,654	23,868	24,310	24,957	25,419	25,712
Clarence Valley	30,677	30,269	30,916	30,751	30,237	29,518
Kyogle	3,619	4,002	3,921	3,756	3,563	3,348
Lismore	20,588	26,803	27,522	27,217	26,698	25,975
Richmond Valley	9,760	11,230	11,335	11,403	11,401	11,327
Tweed	37,904	48,544	50,621	52,309	53,707	54,799
Bellingen	8,859	5,165	5,211	5,216	5,195	5,147
Coffs Harbour	39,691	41,160	42,912	44,320	45,450	46,321
Kempsey	14,854	16,544	16,416	16,349	16,193	15,946
Mid-Coast	70,528	57,497	59,042	60,118	60,695	60,853
Nambucca	9,205	8,427	8,524	8,639	8,722	8,765
Port Macquarie- Hastings	48,400	54,375	56,300	59,131	61,271	62,937
TOTAL	346,950	349,133	358,485	366,064	370,755	373,006

Table 6 Total domestic waste generation - historic and project by council in intervals

Current and forecast generation of domestic waste is illustrated geographically in Figure 10 and Figure 11, respectively. They show the impact of population change at the Statistical Area Level 2 scale (SA2), which is designed to reflect functional areas that represent a community that interacts together socially and economically.⁶

The figures show declining waste generation in some inland areas, notably in the Lismore LGA, while coastal areas generally experience no significant increase or decrease in the scale of waste generation.

⁶ SA2s generally have a population range of 3,000 to 25,000 people, and have an average population of about 10,000 people. It is the smallest area for the release of many statistics by the Australian Bureau of Statistics.



Figure 10: An overview of MSW generation intensity by sub-region in 2018-19 (SA2 geographic scale).



Figure 11: An overview of forecast MSW generation intensity by sub-region in 2039-40 (SA2 geographic scale).

3.4 Resource recovery

3.4.1 Recovery rate

The resource recovery rates for MSW in the region, based on data reported to the NSW EPA, vary between 42% in Kyogle to a reported 96% in Nambucca⁷ (see Table 4 above). With a North Coast average of 57%, the region is outperforming most of NSW and is around 15 percentage points higher than the state average (42% recovery of MSW in 2017-18). The MSW recycling rate is still below the state target of 70% by 2021-22 but significantly better than most other regions in the state, with the region home to some of the best performing NSW councils for MSW recovery.

Figure 12 and Figure 13 present the recent historic trends in MSW recovery rates for each council, split by sub-region. It shows there has been steady improvements by most councils over the past eight years, despite some fluctuations. The region-wide recovery rate has increased from 51% in 2011-12 to 57% in 2018-19, noting that a number of councils were already achieving high recovery rates back in 2011-12.

It is noted that the councils that either do not provide a kerbside organics service (e.g. Kyogle) or provide it on a fortnightly basis (e.g. Kempsey and MidCoast) have recovery rates at the lower end of the range (although still around or above the state average). It is also acknowledged that councils such as Kyogle face some unique challenges in implementing new kerbside services on account of its small and dispersed population (lack of scale and efficiency).



Figure 12: Historic recovery rates by council – NEWaste region councils

⁷ This high recovery rate is attributed to the residual recovery via the Biomass Solutions AWT facility. Please note, the 2018/19 recovery data appears as an outlier and is discussed further in Section 5.10.2



Figure 13: Historic recovery rates by council - MidWaste region councils

Figure 14 below summarises the recovery tonnage across the region, collated into major streams. In this case, the 'other' recycling and organics streams include drop-off and clean-up recovery. 'Other council garden organics' has been excluded on the basis that there were some anomalous one-off, very large tonnages reported by some councils at varying times.

The chart shows that recovery tonnages have steadily increased across the region over the past eight years, largely driven by growing organics recovery, but also improvements in recycling of non-kerbside stream, such as via transfer stations and resource recovery centres.



Figure 14: Summary of regional major recovery streams – historic and future projections (BAU)

	2014-15	2019-20	2024-25	2029-30	2034-35	2039-40
Kerbside recycling (recovered)	63,413	61,823	63,494	64,842	65,687	66,103
Other recycling (non-kerbside)	27,745	29,687	30,368	30,778	30,933	30,877
Kerbside organics (GO+FOGO)	63,307	80,103	82,329	84,198	85,407	86,057
Other organics (non-kerbside)	29,844	24,914	25,613	26,189	26,549	26,729
AWT recovery	13,904	4,973	5,102	5,210	5,291	5,345

Table 7 Summary of regional major recovery streams - historic and future projections (BAU) in intervals

Figure 15 following presents the same data but on a per capita basis. It shows similar trends. On a per capita basis, the total recovery per person has increased by 12% and recovery of organics has increased by 13% from 2011-12 to 2017-18.



Figure 15: Summary of regional major recovery streams, per capita basis - historic and future projections (BAU)

	2014-15	2019-20	2024-25	2029-30	2034-35	2039-40
Kerbside recycling per capita	105	99	99	99	99	99
Other recycling (non-kerbside) per capita	46	47	47	47	46	46
Kerbside organics per capita	105	128	128	128	128	128
Other organics (non-kerbside) per capita	50	39	39	39	39	39
AWT recovery per capita	23	8	8	8	8	8

Table 8 Summary of regional major recovery streams (per capita) historic and future projections (BAU)

Container deposit scheme

Another key dynamic is the containers collected by the Return and Earn CDS scheme, which totalled 7,400 tonnes from across the region in the six months from July to December 2019⁸. The annualised 15,000 tonnes of containers collected through the CDS is still processed by MRFs, with all MRFs sorting eligible contains from the kerbside co-mingled recycling stream and the Lismore MRF also sorting all containers deposited through Exchange for Change across the North Coast.

The overwhelming majority of material (by weight) was glass, with followed by aluminium cans and PET bottles (Figure 16). Improved collection of PET and HDPE may reduce the misplacement of plastic containers in the kerbside residual waste stream, reducing the calorific value of the stream if it is sent to energy from waste (see below).



Figure 16: The composition of containers (tonnes) collected through Return and Earn in the North Coast region July-Dec 2019

⁸ NSW Local Government Area - Return and Earn Collections by Material Type through the Network Operator (in Tonnes), 6 monthly report ending Dec 2019

3.4.2 Municipal waste composition

Residual waste

The composition of the aggregated North Coast residual waste steam is illustrated in Figure 17 in terms of conventional recovery potential, and as a result the proportion remaining that is generally available for energy recovery.

It shows there is considerable scope to improve household recycling practices, with the red-lid bin consisting of almost 14% garden organics, 17% recyclables and another 3% potentially recyclable (which is classified as being materials that are not compliant with the kerbside recycling bin, but may be recovered by a MRF or AWT due to their value or other factors). Despite all councils but one operating FOGO collection systems, the second biggest component of residual waste is food scraps (25%), which is comparable to the typical performance for FOGO in NSW given 55% of food waste (which is typically 50% of residual waste bin contents) is left in the bin⁹.



Figure 17: Average North Coast residual waste composition (other than Kyogle) (based on audits from 2016-20)

The 'Other' fraction of non-recoverable waste accounts for 33% of the overall residual waste stream, although this varies from a low of 10% in Richmond Valley to a high of 49% in Tweed (Figure 18). Electronic and hazardous wastes and earth-based materials, such as ceramics, dust, dirt, rock and plasterboard, account for almost 8% and would ideally be screened before any EfW combustion process.

It should be noted that the MidCoast data is an average representation of a number of audits from Taree, Gloucester and Great Lakes.

⁹ Domestic kerbside waste and recycling in NSW (results of the 2011 waste audits), NSW EPA



Figure 18: Residual Waste Composition (other than Kyogle) (based on audits from 2016-20)

Residual waste calorific value

In addition to the above breakdown of composition, an independent investigation was undertaken in 2019 into the suitability of the waste from four NEWaste Councils for energy recovery in a thermal process. Japanese consulting firm Pacific Consultants analysed the calorific value (CV) of the residual waste from Byron, Lismore, Richmond Valley and Tweed councils as part of a pre-feasibility study for Richmond Valley Council into development of a regional energy-from-waste facility¹⁰.

The key finding is that the aggregated waste is highly suitable for use as a fuel an EfW facility, even using the lower CV estimate of 12.5 megajoules per kilogram (Table 9). Nearly 54% of the waste stream is combustible, while ash residue for disposal or processing would be in the order of 13%.

Assumed Waste Contents					
Burnable (%)	53.97				
Moisture (%)	33.35				
Ash (%)	12.68				
Lower Calories (kJ/kg)	12,510				

Table 9: Key EfW characteristics of the aggregated waste

The detailed results are presented in Table 10 below. There was a relatively high level of consistency across three Councils in the key parameters, with waste from Tweed somewhat different in several key aspects, with more plastic, less food and more non-combustible materials resulting in a higher CV (low estimate) but also higher ash residue. However, the aggregated results are most important given the facility will almost certainly take feedstock from a range of Councils.

The report will be used to provide a more detailed assessment in subsequent reports.

¹⁰ Summary of the Pre-Feasibility Study, Energy from Waste Project at Richmond Valley, NSW. March 2019. Pacific Consultants Co., Ltd.

Table 10: Detailed waste analysis, 2019

Parameter	Unit	Lismore	Richmond Valley	Byron	Tweed	Total (Average)		
Density	kg/m ³	113.3	118.7	117.8	113.1	114.9		
Plastic	%	28.1	24.2	27.9	35.3	31.1		
Paper	%	39.9	50.9	43.6	38.5	41.3		
Kitchen Waste	%	19.2	14.4	19.6	11.3	15.1		
Green Wood	%	0.5	0.1	1.5	0.4	0.7		
Not burnable	%	11.8	9.9	7.4	14.5	11.8		
Others	%	0.5	0.5	0.0	0.0	0.1		
Moisture	%	45.2	41.0	39.5	24.4	33.3		
Burnable	%	45.7	49.0	52.8	58.5	54.0		
Ash	%	9.2	9.9	7.8	17.1	12.7		
High-Calorie	kJ/kg	22,075	20,772	22,411	20,985	21,510		
Lower-Calorie	kJ/kg	10,373	10,357	11,669	14,157	12,513		
Elemental Composition								
Carbon	%	59.5	57.2	56.7	60.2	58.9		
Hydrogen	%	8.3	7.9	7.9	8.4	8.2		
Nitrogen	%	1.1	0.9	1.3	1.2	1.2		
Sulfur	%	0.2	0.1	0.1	0.1	0.1		
Oxygen	%	30.3	32.6	32.8	28.8	30.4		
Chlorine	%	0.6	0.5	0.7	0.8	0.7		
Fluorine	ppm	170.6	88.1	107.0	122.7	123.2		

Commingled recycling

The composition of the aggregated North Coast recyclable waste steam is illustrated in Figure 19 with paper and cardboard making up 43% of the contents in the yellow-lid bin, followed by glass containers at almost 30%.



Figure 19: Average recycling composition (other than Kyogle) (based on audits from 2016-20)

It should be noted that this data is predominately before the introduction of the container deposit scheme (CDS) in December 2017, which diverts glass, plastic and aluminium containers from the kerbside recycling stream. It is likely that since these audits were conducted, the volumes of these materials have decreased and will continue to decrease as CDS capture rates improve over time.

The composition of the yellow-lid bin is broken down by Council in Figure 20. Paper/cardboard and glass are the largest fractions across all Councils, but there is significant variation in the relative proportions. It is noted that Ballina reports a particularly low volume of glass containers, but this is partially offset by a higher than average volume of glass fines.



Figure 20: Recycling Waste Composition (other than Kyogle) (based on audits from 2016-20)

Garden and food organics

All Councils have a FOGO collection, except for MidCoast, which operates a GO collection, and Kyogle which does not have any organics collection. In addition, no audit data for organics was provided for Ballina. Figure 21 shows that garden organics make up the bulk of the organics stream, with only 5% being food organics



Figure 21: Average organics waste composition across the region (other than Ballina and Kyogle) (based on audits from 2016-20)

Figure 22 profiles the organics stream by Council, indicating low food capture in most FOGO councils. Byron and Port Macquarie had the highest food capture rates.


Figure 22: Organics Waste Composition (other than Ballina and Kyogle) (based on audits from 2016-20)

3.5 Disposal

3.5.1 MSW residual waste volumes

Figure 23 shows the historic volumes of residual waste disposed by councils across the region since 2011-12 and projected into the future under BAU. It shows that councils currently send almost 145,000 tonnes of waste to landfill (2018-19) and this volume has fluctuated over the past eight years. Kerbside residual waste accounts for the majority of that volume (just over 93,000 tonnes or 64% of the total, in 2018-19), while drop-off waste contributes a further 27%. Contamination or residuals from the processing or recycling and organics makes a minor contribution, as does clean-up waste.

Figure 24 shows the same data on a per capita basis. There is an apparent declining trend from 2011-12 to 2017-18 but then a slight uplift in 2018-19.

As noted in the following section (Section 3.5.2), it is estimated that just over 97,000 tonnes of MSW¹¹ was disposed to landfills in the region in 2018-19 which suggests that a significant volume of waste – just under 50,000 tonnes - is being exported outside of the region for disposal. Most of this volume is going to landfills in South East Queensland, primarily from councils in the northern part of the region that have limited local landfill capacity.

¹¹ As no MidCoast survey was provided, this assumes that all MidCoast residual MSW is being disposed of in their own landfills



Figure 23: Summary of regional residual waste volumes to landfill



Figure 24: Summary of regional residual waste volumes to landfill on per capita basis

3.5.2 Disposal to local landfills

Local landfills, all owned by Councils, collectively received over 225,000 tonnes of waste in 2018/19 (Table 11), of which 43% was MSW, 33% was C&I waste, 10% was C&D waste and 14% was from other or unknown sources. The notably low proportion of locally disposed C&D waste is likely to reflect the practice of hauling the heavy waste stream to Queensland to avoid the NSW waste levy.

There are 16 landfills in the region, but not all are active and only six are strategically significant. Most of these six landfills have significant remaining life and are not under immediate airspace pressure, while others such as Englands Rd Landfill are nearing end of life and diversion to a higher order use is likely to be a priority.

Table 11: Waste to Council Landfills 2018-19 (tonnes)

Council	MSW	C&I waste	C&D waste	Other waste	Total waste
Ballina	-	-	-	-	-
Bellingen	Unknown	Unknown	Unknown	Unknown	Unknown
Byron		-	-	-	-
Clarence Valley	12,200	17,049	12,444	1,515	43,208
Coffs Harbour ¹²	16,240	6,783	4,153	2,824	30,000
Kempsey	4,651	5,089	181	3,679	13,600
Kyogle	2,342	311	94	1	2,748
Lismore	5,891	14,121	-	18,554	38,566
MidCoast ¹³	29,704	Unknown	Unknown	Unknown	29,704
Nambucca	-	-	-	-	-
РМНС	10,689	20,235	1,459	1,426	33,809
Richmond Valley	10	83	1,146	-	1,239
Tweed	15,726	10,982	2,417	3,516	32,641
TOTAL	97,453	74,653	21,894	31,515	225,515
TOTAL (%)	43%	33%	10%	14%	100%
NSW Disposal ¹⁴	2,137,000	2,995,000	1,969,000	-	7,101,000
NSW Disposal (%)	30.1%	42.2%	27.7%	-	100%

3.5.3 Municipal waste availability

Where municipal waste processing and disposal are contracted to the private sector, the stream only becomes available for alternate use at expiry of the contract. Appendix B tabulates the waste processing and disposal contracts and incumbent service providers for each MSW stream across the councils, where relevant. This has been captured in the figures below to indicate the quantity of tonnes on the market over time.

Figure 25 and Figure 26 show the availability of residual MSW tonnes where it is processed or disposed by third parties, with nearly 50,000 tonnes of contracted waste coming onto the market in the next five years.

¹² The total waste figure of 30,000t was provided, of which 16,240t was MSW, the following streams were therefore estimated based on the average percentages of the other councils

¹³ Assumed that all waste was disposed of in council landfills as no survey was provided

¹⁴ National Waste Report 2018, Department of the Environment and Energy.



Figure 25: Available MSW residual tonnages as forecast at contract expiry.



Figure 26: Aggregation of available MSW residual as forecast at expiry of waste processing / disposal contract (where relevant)

Recycling processing contracts are coming up shortly for a number of councils large councils, which provides an opportunity to consider regional and alternative opportunities to sort and recover recyclate (Figure 27 and Figure 28). This is timely given the significant disruption in recycling markets due to the increasing restrictions imposed by export market countries on lower grade recyclate and the intended export bans in Australia on unrefined paper, plastic, glass and tyres.



Figure 27: Available MSW recycling as forecast at contract expiry.



Figure 28: Aggregation of available MSW recycling as forecast at contract expiry.

Organics contracts are in a state of flux due to the fire at the Lismore facility in August 2019 as numerous councils were using this facility including Lismore, including, Byron, Ballina and Richmond Valley. These councils are currently investigating their long term options and a better understanding of current and long term contracts is required to improve the current assessment of market availability of organics tonnes (Figure 29 and Figure 30).



Figure 29: Available MSW organics as forecast at contract expiry.



Figure 30: Aggregation of available MSW organics as forecast at contract expiry.

4 EXISTING INFRASTRUCTURE

4.1 Overview

The North Coast region has more than 55 waste private and council-owned facilities of all types, including transfer, recovery, disposal and secondary processing.

The only firm proposals to add to that inventory (i.e. that have secured planning approval) are two advanced composting facilities for household FOGO, Tweed's Stotts Creek facility (25,000 tpa) and Richmond Valley's FOGO composting facility (5,000 tpa)¹⁵.

Figure 31 illustrates the existing waste infrastructure across the region, based on the survey of Councils and consultation with industry stakeholders.

¹⁵ According to a review of the NSW Department of Planning's Major Projects website, http://majorprojects.planning.nsw.gov.au/



Figure 31: Map of existing Council waste infrastructure

4.2 Transfer Infrastructure

A transfer station receives waste from collection vehicles and waste generators for consolidation before transfer to a disposal or recovery facility.

Transfer stations in the region are council-owned and open to the community, incorporating a range of recycling options and other waste services for householders and small business customers, such as drop-off and consolidation facilities for recyclables and problem wastes. No private transfer infrastructure was identified in the contractor consultation.

Transfer stations can be categorised according to their scale and functionality as:

- Primary transfer stations Significant facilities that service a large proportion of the population or market within the local area (e.g. local government area). Seven councils have at least one primary transfer station that offers the full range of services. A number are co-located with landfills, while others are stand-alone.
- Secondary and satellite transfer stations Smaller facilities servicing a smaller catchment
 population, sometimes with a reduced range of services on offer and specifically located to service
 urban fringe, rural areas and smaller towns or villages.

Private operators may also operate depots where, apart from storing and servicing vehicles, they may aggregate and consolidate relatively small volumes of waste. The region has no bulking transfer stations specifically designed to consolidate waste into high volume trailers or containers for efficient long-haul transfer. While some council facilities may have a degree of bulking capacity, the focus is on large-scale facilities capable of loading into high volume vehicles, which typically requires specific design features and plant.

Council	Site Name	Category
Ballina	Ballina Waste Management Facility	Primary
Bellingen	Raleigh Waste Management Centre Bellingen Transfer Station Dorrigo Waste Management centre	Drop off only
Byron	Byron Resource Recovery Centre	Primary
Clarence	Grafton Waste Transfer Station	Primary
	Maclean Waste Transfer Station	Primary
	Copmanhurst Waste Transfer Station	Small rural / satellite
	Iluka Waste Transfer Station	Small rural / satellite
	Baryulgil Waste Transfer Station	Small rural / satellite
	Glenreagh Waste Transfer Station	Small rural / satellite
	Tyringham Waste Transfer Station	Small rural / satellite
Coffs Harbour	Woolgoolga Waste Transfer Station	Small rural / satellite
	Coramba Waste Transfer Station	Small rural / satellite
	_owanna Waste Transfer Station Small rural / satellite	

Table 12: Summary of waste transfer stations within the region, including drop off facilities

	Englands Road Waste Management Facility	Drop off only
Kempsey	Stuarts Point Waste Transfer Station	Small rural / satellite
	South West Rocks Waste Transfer Station	Small rural / satellite
	Bellbrook Waste Transfer Station	Small rural / satellite
	Kempsey Waste Management Centre	Drop off only
Kyogle	Woodenbong Transfer Station	Small rural / satellite
	Bonalbo Transfer Station	Small rural / satellite
	Mallanganee Transfer Station	Small rural / satellite
	Kyogle Landfill	Drop off only
Lismore	Lismore Recycling and Recovery Centre	Primary
	Nimbin Transfer Station	Small rural / satellite
	Brewster Street Drop Off Centre	Small rural / satellite
MidCoast	Bulahdelah Resource Recovery & Waste Transfer Station	Primary
	Tea Gardens Resource Recovery & Waste Transfer Station	Primary
	Tuncurry Waste Management Centre	Primary
	Bucketts Way Landfill	Drop off only
	Gloucester Landfill	Drop off only
	Stroud Landfill	Drop off only
Nambucca	Nambucca Waste Management Facility	Small rural / satellite
Port Macquarie-	Port Macquarie Transfer Station	Primary
riasungs	Kew Transfer Station	Primary
	Wauchope Transfer Station	Primary
	Comboyne Transfer Station	Small rural / satellite
	Cairncross Waste Management Facility	Drop off only
Richmond Valley	Nammoona Waste Facility	Primary
	Evans Head Transfer Station	Small rural / satellite
	Coraki Transfer Station	Small rural / satellite
	Rappville Transfer Station	Small rural / satellite

		· ·
Tweed Stotts	Creek Resource Recovery Centre	Primary

4.3 Recovery and reprocessing infrastructure

A recovery facility takes mixed recyclable material and sorts it, usually mechanically, into material streams, which are then able to be sold as commodities for further refinement. A reprocessing facility takes sorted materials, either as outputs from a recovery facility or that have been segregated at source, and substantially changes the nature of the material (physically or chemically), converting it into either a market-ready product or a manufacturing-ready feedstock material.

In some cases, the delineation between a recovery and reprocessing facility is not clear, with recovery facilities also value-adding to some streams to secure end market demand or increase offtake prices. As such, recovery and reprocessing infrastructure has been considered together. Within this broad category, common facility types include:

- Materials recovery facility (MRF) A MRF typically receives and sorts mixed streams of recyclables that have been somewhat segregated at source (e.g. commingled kerbside recycling) but may also receive source separated recyclables. Recyclables are sorted by material type through mechanical and manual processes, then consolidated (compacted and baled) and sent to reprocessing facilities.
- Resource recovery centre (RRC) A facility separating target recyclables from dry materials, either in mixed or single streams, using mechanical means. It uses primarily mobile equipment and manual means rather than fixed, automated plant. It may be co-located with landfill or transfer station, and may include some reprocessing.
- **C&D recycling facility** A sorting and reprocessing facility that is specifically designed to recover process C&D waste. Most existing facilities are only capable of processing source separated materials such as concrete, brick and soils, with relatively basic processing including crushing and screening to produce secondary aggregate and road-base products. Increasingly, more sophisticated facilities are being developed which are capable of receiving a mixed C&D stream (such as that collected in skip bins) and sorting it into material types through various stages of mechanical and manual processing.
- **Reprocessing facilities** Typically specialising in a particular material stream, these facilities take pre-sorted materials and change their physical and/or chemical nature, adding value to the processed material so that it can become a feedstock for a manufacturing process or otherwise reenter the economic cycle. Reprocessing facilities typically manage single-stream materials such as paper / cardboard, plastics, glass, timber, metals, batteries, e-waste, tyres and oils.

4.3.1 Material Recovery Facilities

For the purpose of this report, MRFs are those facilities which primarily process a commingled stream of recyclable packaging, sourced predominantly from household kerbside collections with some commercial material.

There are six MRFs for commingled MSW in the region (Table 13) with an estimated capacity of 112,500 tpa, with limits imposed either through licences or assumed design throughput. One MRF is council-operated (Lismore), while JR Richards operates two facilities (Port Macquarie and Tuncurry), Polytrade operates two (Grafton and Chinderah) and Handybin operates the Coffs Harbour MRF.

Lismore is installing a new glass processing plant at the MRF in 2020/21 which will have the capacity to take additional separated glass for processing.

Table 13: Summary of MRFs within the region, 2018/19

MRF Location	Input (tpa)	Output (tpa)	Sent to Landfill (tpa)	Recovery Rate	Comments
Grafton Materials Recovery Facility (Clarence Valley)	6,500	6,337	163	97%	No annual limit (assumed 7,500 tpa capacity ¹⁶)
Coffs Harbour (Coffs Harbour)	14,850	11,827	3.023	80%	Annual limit of 20,000 tpa
Lismore MRF (Lismore)	14,453	11,438	3,015	79%	Annual limit of 15,000 tpa
Cairncross Material Recovery Facility (Port Macquarie)	15,677	14,265	1,412	91%	Technical constraint of 20,000tpa
Tuncurry Materials Recovery Facility (MidCoast)	~14,000 ¹⁷	No data available		Annual limit of 20,000 tpa	
Chinderah (Tweed)		No da	ata available		Annual limit of 30,000 tpa

Councils in the region provided some visibility into the types of end markets for recyclate, although not by scale or location:

- Paper and cardboard Supplied to domestic remanufacturers (Visy and Orora) and exported
- Plastic HDPE and polypropylene (PP) can both be converted into flake and resin streams, for export and supplying Australian product manufacturers. (e.g. Geofabrics Australasia, Modwood Technologies, Pipetech Water Air (Gas VLX) and Vicfarm Plastics). Very limited markets for mixed plastics.
- Glass Sorted glass cullet (amber, green and clear) is supplied to OI in Victoria and NSW.
 Polytrade recently opened a glass beneficiation plant in Melbourne. Mixed glass and glass fines can be reprocessed as glass sand within the region, including a Tuncurry reprocessor that produces six different products including swimming pool filter.
- Metals Primarily exported.

4.3.2 Resource Recovery Centres

Resource Recovery Centres provide a range of different waste facilities which are accessed directly by the community (residents and small business users). Most of these facilities are well established and operating successfully, but there may be opportunities to upgrade and optimise the facilities to maximise resource recovery performance.

¹⁶ http://newaste.org.au/assets/NE_WASTE_STRATEGY_REV_1-1_2017.pdf (Table 7)

¹⁷ http://midcoastwaste.com.au/facilities/materials-recovery-facility/

Table 14: Summary of RRC's within the region, 2018/19

Council	Facility
MidCoast	Gloucester Landfill & Community Recycling Centre
	Taree Waste Management Centre
	Tuncurry Waste Management Centre and Materials Recovery Facility
Ballina	Ballina Waste Management Facility
Byron	Byron Resource Recovery Facility
Richmond Valley	Nammoona Waste Facility
	Grafton Regional Landfill
Clarence valley	Maclean Waste Transfer Station
Kyogle	Kyogle Waste Facility
Lismore	Lismore Recycling and Recovery Centre
Tweed	Stotts Creek Resource Recovery Centre
Bellingen	Raleigh Waste Management Centre
Coffs harbour	Coffs Harbour Resource Recovery Park
Kempsey	Kempsey Waste Management Centre
Nambucca	Nambucca Waste Management Facility
Port Macquarie	Port Macquarie CRC

4.3.3 C&D Recycling

Most council facilities will receive some types of C&D waste, although none are configured to separate mixed C&D waste. Their processes are based on factors including economies of scale, material type and risk, experience of previous recovery measures and regulatory guidance. In the MidCoast region, the following facilities accept C&D waste:

- Englands Road Waste Management Facility
- Raleigh Waste Management Centre
- Nambucca Waste Management Facility
- Kempsey Waste Management Centre
- Cairncross Waste Management Facility
- Taree Waste Management Centre
- Tuncurry Waste Management Centre
- Stotts Creek Resource Recovery Centre

End markets depend on the material type. Crushed concrete, bricks and tiles go to various destinations, with Cairncross providing the material for Council civil works off-site and Kempsey

selling to private companies for use off site. Clean soil is generally stockpiled and used for daily or intermediate cover at the receiving facility.

Green waste and woodchip is generally combined with other organic waste such as untreated timber and pallets to be processed into mulch/compost.

Cardboard is generally aggregated with other cardboard, baled and sold for reprocessing. Scrap metal is usually stockpiled and collected by a recycler. Salvageable items generally go to the on-site tip shop to be re-sold.

Through the private contractor consultations, a privately owned C&D facility was identified in Ballina which is owned by North Coast Recycling / Bens Skip Bins / Bobcat. It mostly recycles concrete and has a licence of 6,000tpa, but they are planning to upgrade to 30,000tpa. They are also planning on opening another facility in the near future.

4.4 Organics processing infrastructure

Organics processing facilities are a form of reprocessing for source separated organic wastes, typically either through aerobic (composting) or anaerobic (digestion) processes. Outputs are most commonly compost, soil improver and mulch products, which are applied to land. In the case of digestion facilities, energy may also be produced.

Organics processing facilities can potentially process a range of organic wastes including food organics, garden organics and timber, as well as agricultural and forestry residues and organic liquid waste. They have been categorised as follows:

- Composting facilities Aerobic decomposition of organic waste through open windrow or intensive in-vessel methods to produce compost or other soil improver products, which are then sold into landscaping and agricultural markets, and sometimes made available to residents for household application.
- Anaerobic digestion (AD) Anaerobic decomposition of organic waste (in the absence of oxygen), resulting in the production of methane-rich biogas as allow-carbon fuel. AD is not used in the region for municipal wastes, but may play a greater role in processing food waste and other commercial and industrial streams (wet AD) and possibly in processing mixed food and garden organics streams (e.g. through dry AD systems).
- Mechanical biological treatment (MBT) facilities Mechanically processes mixed putrescible waste (typically MSW, C&I and other organic wastes) to separate recyclables and an organic fraction, which is processed biologically on-site either to produce a soil improver. These facilities could also be classified as recovery, but given the main purpose is usually organics recovery, they have been categorised as an organics processing solution. There is one existing MBT facility in Coffs Harbour. In the future, MBT facilities could potentially be deployed, as they are Europe, as a method of producing refuse derived fuel (RDF) from putrescible waste, by bio-drying the organic fraction rather than composting.

Table 15 identifies the organics processing infrastructure within the region. There are four composting facilities and one MBT distributed reasonably evenly across the North Coast region. However, after experiencing a fire in August 2019, the Lismore composting facility is closed until further notice. Therefore, the annual capacity of the remaining three operators is 150,000tpa.

Despite two composting facilities in the northern part of the region, there is a shortage of local processing capacity and some councils are using composting facilities in South East Queensland, particularly in the Gold Coast area.

However, both Tweed and Richmond Valley councils plan to develop new facilities for processing food and garden organics (FOGO) from household kerbside collections. Soilco has been contracted to design, construct and operate Tweed's 25,000 tpa in-vessel composting facility at Stotts Creek, scheduled to open in mid-2021, while Richmond Valley is seeking a suitable site for a 5,000 tpa windrow composting facility possibly using a mobile aerated floor (MAF) to improve efficiency and quality.

Facility	Received (tonnes)	Recovered (tonnes)	Landfilled (tonnes)	Recovery %	Contracted Councils	Technology
Biomass	1,326	646	680	49%	Bellingen	Mechanical
AWT Facility	13,298	5,718	7,580	43%	Coffs Harbour	Treatment
	2,980	2,828	153	95% ¹⁸	Nambucca	-
Grafton Organics Processing Facility	7,476	7,423	53	99%	Clarence Valley	In-vessel composting
Lismore Composting Facility*	26,599	24,919	1,680	94%	Lismore, Byron, Ballina, Richmond Valley, Tenterfield and Tweed	Open Windrow composting
Cairncross Organic Resource Recovery Facility	33,895	32,621	1,274	96%	Port Macquarie and Kempsey	In-vessel composting
Bucketts Way Resource Recovery Facility	WLRM grant for 12,000 tpa				MidCoast	

Table 15: Summary of organics processing infrastructure in the region (2018/19)

* Currently experiencing short-term closure due to a fire in August 2019.

4.5 Disposal infrastructure

Landfills provide a management option for waste that is not practical or economically viable to reuse, recycle or recover energy from. They can be broadly classified according to their ability to receive putrescible waste (i.e. with readily decomposable organic content), with higher standards of containment and regulation for putrescible landfills due the higher potential for environmental impact (e.g. landfill gas generation or leachate seepage).

There are 15 landfills within the region, with two additional inactive (but not yet closed) landfills. All are Council-owned and able to accept putrescible waste.

It is also noted that several councils in the northern part of the region have been transferring waste to landfills in South East Queensland over recent years due to a lack of local disposal capacity. This practice is likely to continue for most of those councils, despite the recent introduction of a landfill levy in Queensland.

¹⁸ As discussed earlier, an assumption could be made that the AWT input tonnage was recorded instead of the recovered tonnage.

Table 16: Summary of landfills in the region

Council	Landfill	Remaining capacity (approved) (tonnes)	Current expected year of closure	Potential additional capacity (unapproved) (tonnes)	Approved annual tonnage input		
Ballina	Ballina Waste Management Facility (inactive)	10,000	2025/26	550,000	N/A		
Bellingen	Raleigh Waste Management Centre	No data provid	No data provided for this facility				
	Dorrigo Waste Management Centre	Pending closu	Pending closure				
Byron	Byron Resource Recovery Centre (inactive)	Pending 2020/21 closure					
Clarence Valley	Grafton Regional Landfill	505,000	2000 2030 2,130,000		50,000		
Coffs Harbour	Englands Road Waste Management Facility	240,000	00 2022 0		No annual limit		
Kempsey	Kempsey Waste Management Centre	No data provided			25,000		
Kyogle	Kyogle Landfill Facility	173,000	2070	0	5,000		
Lismore	Wyrallah Road Landfill	350,000	2027/28	500,000	40,000		
MidCoast	Taree Waste Management Centre	800,000	800,000 2050+ To be c		Any capacity		
	Gloucester Landfill	32,000	2036	0	2,000		
	Stroud Landfill	800	2020	Conversion to Transfer Station	N/A		
	Tuncurry Landfill	20,000	2020/21	Pending closure			
	Minimbah Landfill (Approved but not yet operational)	4-stage project (over 2 phases):					
		* 1,000,000	2070+	To be determined	20,000		
		* 2,000,000	2120+				
Nambucca	Nambucca Waste Management Facility	No data provid	ded for this facili	ty			

Port Macquarie	Cairncross Waste Management Facility	3,580,561	2056	0	100,000
Richmond Valley	Nammoona Waste Facility	15,000	2035	156,000	28,000
Tweed	Stotts Creek Resource Recovery Centre	849,572 (inc 153,000 constructed)	2050+ (estimated)	1,000,000	75,000
Total	-	9,575,933	-	4,336,000	-

5 COUNCIL PROFILES

This section provides a more detailed discussion on potential opportunities within each of the thirteen LGAs. The industries and activities that drive the regional economy in each region will have a significant impact on the types and volumes of waste that are generated in the region and future growth in both resident population and waste generation. It is also important to understand the major industries.

s in the region as they could potentially be users of recovered resources, both in terms of materials and energy. This section provides an overview of the regional economy and the major industries as well as the environmental setting to the extent that it may influence future waste infrastructure and planning.

Through understanding the future projected waste flows in each region and the composition of these streams, in addition to the current contracts and end destinations, it is possible to identify where there will be gaps in future capacity, accounting for future growth and improved resource recovery. This chapter provides an overview of the capacity gap analysis in each region and the potential opportunities that will arise, with reference to the discussion in section 4 above.

5.1 Ballina Shire Council

5.1.1 Overview

Ballina Shire is a compact 485 km² coastal LGA on the far NSW North Coast with a relatively high population of nearly 43,000 people in 2016, resulting in one of the highest densities across the study area (88 people per km²).

It is predominately rural, with 93% of the area zoned rural or environmental protection, however towns and villages are growing, with new business investment following improved connectivity to Queensland and south, including ongoing upgrades to the Pacific Highway.

The 2017 Community Strategic Plan aims to reduce waste to landfill below the current 250 kg per person.

Council currently provides around 17,500 kerbside bin collection services across the Shire, of which

Key characteristics

Industry:

- Agriculture, including fruit and nut growing, flower nurseries and livestock
- Commercial fishing and Sydney rock oyster production
- Tourism, with an average 816,000 visitors annually
- Construction and diverse manufacturing

Income distribution skews lower than the NSW average

94.2% employment in full or part time work (NSW average: 98%)

64% of households are privately owned (NSW average: 63.5%).

14,880 properties have a 3-bin service (FOGO for organics) and 2,712 rural properties a 2-bin residual waste and recycling service.

Council also provides collection and disposal services for both C&I and C&D waste¹⁹.

5.1.2 Waste stream characterisation

This section further investigates the MSW stream in Ballina based on analysis of the Council's most recent WARR report (2018/19) and responses to a survey for this project.

5.1.2.1 Waste Flows

Ballina generated 19,200 tonnes of MSW in 2018/19, 5.7% of the North Coast regional total, with a recovery rate of 54%, comparable to the regional average of 57%. Figure 32 provides an overview of past and projected waste flows by stream, with the forecast based on expected population growth.

¹⁹ Community Strategic Plan 2017-2027

The underpinning data is provided in Table 17. Waste generation may be inflated due to the impacts of tourism in the region, particularly in accommodation such as home rentals and Airbnb where the waste would enter the municipal stream.



Figure 32: Summary of major waste flows - historic and projected (BAU)

Paramotor	Current	Current BAU Future Projections			
	2018-19	2029-30	2039-40	2049-50	
Kerbside recycling (recovered)	4,315	4,867	4,969	5,024	
Drop-off recycling (recovered)	1,718	1,092	1,115	1,127	
Clean-up recycling	-	-	-	-	
Drop-off Household Hazardous recycled	-	10	10	10	
CDS recycling (in LGA)	-	101	103	104	
Total recycling	6,033	6,070	6,197	6,266	
Kerbside organics (GO+FOGO)	4,365	5,948	6,073	6,140	
Drop off Organics	-	879	898	907	
Other Council Garden Organics	-	207	212	214	
Total organics recovered	4,365	7,034	7,182	7,261	
AWT recovery of residual waste	-	-	-	-	
Total recovery	10,398	13,104	13,380	13,527	
Kerbside residual waste to landfill	6,921	7,817	7,982	8,069	
Drop-off residual waste to landfill	1,939	910	929	939	
Clean-up waste disposed	-	-	-	-	
Total recovery residuals disposed	-	66	67	68	
Total residual to landfill	8,861	8,793	8,978	9,077	
Total domestic waste generation	19,259	21,897	22,358	22,603	
Domestic waste generation per capita	433	475	475	475	
Overall domestic recovery rate	54%	60%	60%	60%	

Table 17: Current domestic waste breakdown and future BAU projections (no change in recovery)

Waste generation per capita in Ballina in 2017-18 was 509 kg (Figure 33), among the lowest in the study area, and is forecast to remain well below the current regional average of 514 kg per capita per year (Table 5).



Figure 33: Summary headline waste flows on a per capita basis – historic and projected (BAU)

5.1.2.2 Waste Characterisation

A 2016 audit found a majority of the residual waste bin could be recycled, either via the FOGO service (52%) or commingled recycling (27%)²⁰. A much lower contamination rate was found in the recycling bin (11%), most of which was organics.

While difficult to get visibility into C&I and C&D waste streams, the Ballina Shire Integrated Waste Strategy in 2010 shed some light on composition, albeit somewhat dated. The largest fraction of the C&I stream was putrescible waste, followed closely by paper and cardboard. A quarter of the C&D was made up of mixed soil and demolition waste, followed by contaminated soil and concrete. Council provides collection and disposal services to C&D sector.

5.1.3 Waste contracts and destinations

Both residual waste and recycling collections are delivered internally by council day labour, while organics collection is contracted to Solo until June 2020.

Recyclables are processed at Polytrade Chinderah (contracted until August 2022), while FOGO is being processed by Phoenix Power Recyclers in South East Queensland since the short-term closure of Lismore Council's processing facility due to a fire in August 2019.

Landfill disposal of residual MSW is provided by Veolia Ti Tree on a month to month basis, but this is currently open to tender for a 2-3 year contract covering transport and disposal.

²⁰ Audits of domestic kerbside, public-place litter and Waste Management Facility receivals, 2016. A. Prince Consulting.

Table 18: Summary of waste destinations

Material / Stream	Primary Destination	Secondary reprocessing / end market
Residual waste	Veolia Ti Tree Landfill (Qld)	-
Garden organics	GoGrow Ballina	Composted and included in various commercial products
Food and garden organics	Phoenix Power Recyclers	Composted into a commercial product
Paper / cardboard	Polytrade Recycling, Chinderah	Remanufacturers (e.g. Visy. Orora)
Plastics	Polytrade Recycling, Chinderah	Domestic reprocessors / remanufacturers and export
Glass	Polytrade Recycling, Chinderah	Sort glass cullet sent to OI in Victoria and NSW
Metal packaging	Polytrade Recycling, Chinderah	Sold to international markets
Cardboard – Self-hauled to the Ballina WMF	Richmond Waste baling facility in Lismore	Reprocessors
Scrap metal & whitegoods	Infrabuild Recycling (formally Onesteel)	Mix of local and overseas markets
E-waste	Ace Recycling	Mix of local and overseas markets
C&D aggregates	Processed at the Ballina WMF	Operational use at the landfill (pad construction/roads etc) or in Council construction projects
Timber	Veolia Ti Tree Landfill (Qld)	-
Tyres	S&J Australian Scrap Tyre	Used for retread or processed by Chip Tyre into crumbed rubber.
Mattresses	Veolia Ti Tree Landfill (Qld)	-

5.1.4 Current needs and future potential

There is an increasing need for C&D waste processing facilities in the Shire, in particular for the management and reprocessing of soil from infrastructure and construction projects. One major inhibitor is the presence of acid sulfate soils (ASS) and potential acid sulfate soils (PASS), which introduces onerous management and disposal requirements.

Asbestos requires better management and disposal options. This is partly due to the limited landfill capacity at the Ballina Waste Management Facility, in addition to high operating costs from baling waste prior to placement as the landfill is next to the airport and needs to minimise bird activity.

Garden organics is currently transported off the Ballina WMF in raw state (not mulched), while additional concrete processing capacity is also needed.

Council has applied for a modification to split the site (and associated licence) to establish a resource recovery area while retaining the landfill airspace for future use, if required.

Ballina WMF is well configured for future development, with a large, flat area for operations and good access from the Pacific Highway. Constraints include:

- Proximity to the airport and a school (200-300m)
- A large proportion of the site is in a low-lying flood plain
- Potential community sensitivity, restricting the social licence for the development.

5.2 Bellingen Shire Council

5.2.1 Overview

Bellingen Shire is located near the longitudinal centre of the North Coast region, with good access north and south. It represents a small proportion of the study population and relatively compact land area (1,602 km²).

Bellingen is a predominately rural area and environmental, with around 57% designated state forest or national park, and several small townships. Key industries are agriculture, tourism and, increasingly, cultural activities and events.

The population of 12,951 in 2016 is forecast for low growth of 0.72% over the 20 years to 2036.

The dominant household size was two persons per household (38.9%).

Key characteristics

Main industries:

- Dairy farming, timber production and potatoes
- Tourism, with 229,000 visitors annually
- Creative industries

Income distribution skews lower than the NSW average

92.8% employment in full or part time work (NSW average: 98%)

68.3% of households are privately owned (NSW average: 63.5%)

5.2.2 Waste stream characterisationThis section further investigates the MSW stream in Bellingen based on analysis

This section further investigates the MSW stream in Bellingen based on analysis of the Council's most recent WARR report (2018/19) and responses to a survey for this project.

5.2.2.1 Waste Flows

Bellingen generated 4,000 tonnes of MSW in 2018/19, 1.2% of North Coast waste. It achieved a high recovery rate of 76%, 18 percentage points above the regional average, in part through the Biomass Solutions alternative waste treatment (AWT) facility at Coffs Harbour that processes residual waste into soil amendment products.

However, 2018 regulatory changes that remove the option to apply the facility's mixed waste organics outputs (MWOO) means it can no long function as designed and raises uncertainty about the ongoing recovery rate. It is assumed in the base case that the facility will be reconfigured to continue delivering its contracted diversion rate.

There is considerable volatility in the Bellingen waste data. There are no clear drivers for such variation and it may be due to data processes rather than variation in actual waste flows.

Figure 34 provides an overview of past and projected waste flows by stream, with the forecast based on expected population growth. The underpinning data is provided in Table 19.



Figure 34: Summary of major waste flows – historic and projected (BAU)

Parameter	Current volumes	BAU Future Projections			
	2018-19	2029-30	2039-40	2049-50	
Kerbside recycling (recovered)	962	999	986	966	
Drop-off recycling (recovered)	-	285	282	276	
Clean-up recycling	-	-	-	-	
Drop-off HH Haz recycled	-	-	-	-	
CDS recycling (in LGA)	-	-	-	-	
Total recycling	962	1,284	1,267	1,242	
Kerbside organics (GO+FOGO)	1,495	1,455	1,436	1,407	
Drop off Organics	-	385	380	372	
Other Council Garden Organics	-	-	-	-	
Total organics recovered	1,495	1,840	1,816	1,779	
AWT recovery of residual waste	640	685	676	663	
Total recovery	3,096	3,810	3,760	3,683	
Kerbside residual waste to landfill	748	711	702	687	
Drop-off residual waste to landfill	-	316	311	305	
Clean-up waste disposed	111	240	237	232	
Total recovery residuals disposed	103	140	138	135	
Total residual to landfill	962	1,406	1,388	1,359	
Total domestic waste generation	4,058	5,216	5,147	5,043	
Domestic waste generation per capita	312	397	397	397	
Overall domestic recovery rate	76%	73%	73%	73%	

Table 19: Current domestic waste breakdown and future BAU projections (no change in recovery)

Bellingen data shows high variability in waste generation per capita since 2011/12 but generally falling since 2014-15, recording 316 tonnes per capita in 2018-19 (Figure 35). This is significantly below the current regional average of 514 kg per capita.



Figure 35: Summary headline waste flows on a per capita basis – historic and projected (BAU)

5.2.2.2 Waste Characterisation

An audit in 2017 found almost 40% of the contents of the residual waste bin could be recycled within the FOGO bin and 11.7% could be recycled within the commingled bin with a further 4% being potentially recyclable with the relevant infrastructure.

The commingled stream had a contamination rate of almost 14%, mostly consisting of mixed glass fines, contaminated/soiled paper and other waste. The FOGO stream had very low contamination at 1.6%, with the majority of the bin contents being green waste.

5.2.3 Waste contracts and destinations

Kerbside collections for waste, recycling and organics are provided by Handybin Waste Services as part of a joint contract with Coffs Harbour and Nambucca councils, called Coffs Coast Waste Services, until 2027. Handybin also processes the kerbside recycling for the three councils.

Biomass Solutions manages the organics processing and AWT processing of residual MSW in the North Coast's only MBT facility. However, regulatory changes in 2019 that removed permission for MBTs to apply their mixed waste organics outputs (MWOO) to land has created significant uncertainty about the future of this facility. It is currently processing waste and organics, but sending the main outputs to landfill as there is no approved alternative. Coffs Harbour City Council manages the disposal of residual MSW to landfill.

Table 20: Summary of destinations

Material / stream	Primary destination	Secondary reprocessing / end market
Residual waste	Coffs Coast Resource Recovery Facility – Biomass Solutions	MWOO: Currently disposed to Englands Road Waste Management Facility
		Residual: Englands Road WMF
Garden organics	Coffs Coast RRF – Biomass Solutions	Compost market
Food and garden organics	Coffs Coast RRF – Biomass Solutions	Compost market
Paper / cardboard	Coffs Harbour MRF	Reprocessors
Plastics	Coffs Harbour MRF	Reprocessors
Glass	Coffs Harbour MRF	Remanufactured into recovered glass sand (RRO)
Metal packaging	Coffs Harbour MRF	Reprocessors
Scrap metal & whitegoods	Not specified	Not specified
E-waste	Not specified	Not specified
Recovered C&D aggregates	Not specified	Not specified
Recovered soils	Not specified	Not specified
Timber	Not specified	Not specified
Tyres	Not specified	Not specified
Mattresses	Macleay Options	Reprocessors

5.2.4 Current needs and future potential

There is an impending shortage in disposal capacity. Englands Road Landfill at Coffs Harbour is expected to exhaust its airspace in 2022 and Bellingen's Dorrigo Landfill, which is only available for self-haul customers from within the LGA, is also planned to close within the next 18 months. Bellingen's Raleigh landfill is unlined and therefore only takes inert material.

The MWOO regulatory reforms impacting MBTs, including the Biomass Solution facility, has created additional pressure on landfill as the product outputs can now only be disposed to landfill, apart from some minor sorting of recyclables and stabilisation of the waste to landfill. Unless the facility is substantially modified to produce viable output products, this will bring forward the closure date for the Englands Road Landfill.

No future sites in Bellingen were identified for potential development.

5.3 Byron Shire Council

5.3.1 Overview

Byron Shire is located on the far North Coast, sharing boundaries with Tweed, Lismore and Ballina.

The Shire is compact at 567 km² in area and incorporates a wide range of land uses, with significant rural areas and national parks but also urban residential areas along the coast, ruralresidential villages concentrated in the hinterland, and commercial and industrial zones.

Byron has the highest density of all the Councils (88 people per km²), including recent development. The Shire approved 188 new residential and non-residential buildings in 2016-17²¹.

Key characteristics

Main industries:

- Tourism, with around two million visitors annually, mostly to the coastal towns
- Tourism and hospitality generated 23% of Byron's jobs and 14% of output/sales in 2016/17

Income distribution is skewed higher than the NSW average.

93.4% employment in full or part time work (NSW average: 98%).

Population growth in the 20 years from 2016 to 2036 is forecast to be moderate at 10.7%.

5.3.2 Waste stream characterisation

The assessment of the waste flows and context in Byron in the following section is based on analysis of the Council's most recent WARR report (2018-19) and responses to a survey for this project.

5.3.2.1 Waste Flows

In 2018/19, Byron generated 25,600 tonnes of MSW, 7.6% of the regional total, with its 61% recovery rate comparable to the regional performance at 57%. Figure 36 provides an overview of past and projected waste flows by stream, noting the introduction of kerbside FOGO service in 2014-15 and a relatively high proportion of residual waste drop-off compared to other councils in the region. The underpinning data is provided in Table 21. Waste generation may be inflated due to the impacts of tourism in the region, for the likes of accommodation such as home rentals and Airbnb where the waste would enter the municipal stream.

²¹ Byron Shire Council – Economic Profile. Accessed < http://economy.id.com.au/byron >



Figure 36: Summary of major waste flows - historic and projected (BAU)

Table 21: Current domestic waste breakdown and future BA	U projections	(no change in r	ecovery)
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Parameter	Current volumes	BAU Future Projections		
	2018-19	2029-30	2039-40	2049-50
Kerbside recycling (recovered)	5,477	5,384	5,547	5,660
Drop-off recycling (recovered)	1,751	1,665	1,715	1,750
Clean-up recycling	-	-	-	-
Drop-off HH Haz recycled	-	-	-	-
CDS recycling (in LGA)	-	-	-	-
Total recycling	7,228	7,049	7,263	7,411
Kerbside organics (GO+FOGO)	5,055	5,072	5,225	5,332
Drop off Organics	3,389	2,977	3,067	3,130
Other Council Garden Organics	-	-	-	-
Total organics recovered	8,444	8,049	8,292	8,462
AWT recovery of residual waste	-	-	-	-
Total recovery	15,672	15,098	15,555	15,872
Kerbside residual waste to landfill	5,416	5,291	5,451	5,562
Drop-off residual waste to landfill	4,524	4,466	4,601	4,695
Clean-up waste disposed	-	-	-	-
Total recovery residuals disposed	-	-	-	-
Total residual to landfill	9,946	9,859	10,157	10,364
Total domestic waste generation	25,618	24,957	25,712	26,237
Domestic waste generation per capita	735	679	679	679
Overall domestic recovery rate	61%	60%	60%	60%

Waste generation per capita in Byron has fluctuated a little since 2011-12, largely as residual waste has varied (Figure 37). At 735 tonnes per capita in 2018-19, it is well above the regional average of 514 kg per capita.



Figure 37: Summary headline waste flows on a per capita basis – historic and projected (BAU)

5.3.2.2 Waste Characterisation

A 2020 audit found FOGO was the largest single fraction of the residual bin (22.5%), while 15.9% was dry recyclables that should have been in the commingled bin and a further 2.1% was potentially recyclable with the right infrastructure. In total, just over 47% could potentially be diverted from landfill through conventional recovery infrastructure.

The FOGO bin had a contamination rate of almost 6%, while the recycling bin had a contamination rate of almost 8%, mostly made up of material that is potentially recyclable but not accepted in a MRF, highlighting the need for more diverse processing options. Other wastes were also a notable minor fraction.

5.3.3 Waste contracts and destinations

Kerbside waste, recycling and organic collection is being managed by Solo Resource Recovery (Richards Enterprises), under contract until 2022, with extension options.

Polytrade Recycling processes kerbside recycling, also until 2022 with extension options. Organics are being processed at Phoenix Power Recyclers, which is an interim arrangement due to the fire at Lismore composting facility in August 2019.

Landfill disposal of residual MSW is being managed by Veolia and is in the second extension period, with a new tender to be called prior to the end of contract in September 2020.

Table 22: Summary of waste destinations

Material / stream	Primary destination	Secondary reprocessing / end market	
Residual waste	Veolia Ti Tree Landfill, Qld (consolidation at the Byron Resource Recovery Centre)	-	
Garden organics – drop off	BRRC (mobile aerated floor)	Local farmers	
Food and garden organics	Phoenix Power Recyclers	Composted into a commercial product	
Paper / cardboard	Polytrade Recycling, Chinderah	Remanufacturers (e.g. Visy. Orora)	
Plastics	Polytrade Recycling, Chinderah	Domestic reprocessors / remanufacturers and export	
Glass	Polytrade Recycling, Chinderah	Sort glass cullet sent to OI in Victoria and NSW	
Metal packaging	Polytrade Recycling, Chinderah	Sold to international markets	
Scrap metal & whitegoods	One Steel	Unclear	
E-waste	Ace Recycling	Unclear	
Timber – untreated	BRRC (mobile aerated floor)	Local farmers	
Tyres	Tyrecycle	Unclear	
Mattresses	Ti Tree Landfill	Unclear	

5.3.4 Current needs and future potential

FOGO is currently being transported outside of the region at a large cost to council, in addition there is lack of C&D recycling capacity and therefore much is trucked to SE QLD.

Council intends to develop the Byron Resource Recovery Centre to upgrade the facility and expand recycling capacity, while retaining some contingency capacity in the adjoining landfill which is expected to close in 2020/21. The Zero Waste Policy means landfilling within the Shire is not an option.

Council is also planning to build a bioenergy facility alongside their sewerage treatment plant, to process a wide range of organic wastes, which may include commercial food, agricultural residues, kerbside FOGO and other domestic streams. The facility is planned to have a throughput capacity of 20,000 tonnes per annum, of which around 5,000tpa will be from Byron's FOGO collection and the remaining capacity would be available for FOGO material from other Councils. Council is well progressed in the procurement process and anticipates opening in two or three years.

The Myocum Quarry was identified as a possible site for development of a dedicated waste facility, although there are no specific approvals or plans.

5.4 Clarence Valley Council

5.4.1 Overview

Clarence Valley is the biggest LGA by area in the study region, with 80km of coastline and significant areas of national park, state forest and reserves.

There are three major towns and 60 villages, resulting in the second lowest population density of all the Councils at 4.94 people per km². The population is projected to decline over the 2016-2036 timeframe by 2.41%.

Major industry includes commercial estuary and ocean fisheries and well as traditional agricultural industries such as beef and sugar cane production and milling.

New business development is occurring around lifestyle products such as tea tree oil, regional cuisine and food delivery as well as aquaculture

Key characteristics

Main industries:

- Tourism, with nearly 1.1 million visitors annually, mostly to the coastal towns
- Commercial estuary and ocean fisheries
- Tradition industries including beef and sugar cane

Income distribution skews lower than the NSW average

91% employment in full or part time work (NSW average: 98%)

66% of households are privately owned (NSW average: 63.5%).

and ship building. The Council is committed to delivering 140 projects in 2019/20 with an investment of over \$22 million, with a priority being the condition of roads.

5.4.2 Waste stream characterisation

The following section is based on analysis of the Council's most recent WARR report (2018-19) and responses to a survey for this project.

5.4.2.1 Waste Flows

Clarence Valley generated 29,400 tonnes of MSW in 2018-19, which is 8.7% of the regional total, delivering a 55% recovery rate that is comparable to the regional rate of 57%. Figure 38 provides an overview of past and projected waste flows by stream. It exhibits a relatively consistent pattern of waste generation in recent years. The underpinning data is provided in Table 23.



Figure 38: Summary of major waste flows – historic and projected (BAU)

Table 23: Current domestic waste breakdown and future I	BAU projections (no change in recovery)
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Parameter	Current volumes	BAU Future Projections		
	2018-19	2029-30	2039-40	2049-50
Kerbside recycling (recovered)	5,052	6,054	5,811	5,519
Drop-off recycling (recovered)	2,716	2,563	2,460	2,337
Clean-up recycling	352	182	174	166
Drop-off HH Haz recycled	-	4	3	3
CDS recycling (in LGA)	-	147	141	134
Total recycling	8,120	8,949	8,590	8,158
Kerbside organics (GO+FOGO)	6,983	7,509	7,207	6,845
Drop off Organics	1,097	1,944	1,866	1,772
Other Council Garden Organics	-	-	-	-
Total organics recovered	8,080	9,453	9,074	8,617
AWT recovery of residual waste	-	-	-	-
Total recovery	16,200	18,402	17,664	16,775
Kerbside residual waste to landfill	7,607	7,834	7,520	7,141
Drop-off residual waste to landfill	4,545	3,289	3,157	2,998
Clean-up waste disposed	848	978	938	891
Total recovery residuals disposed	193	249	239	227
Total residual to landfill	13,193	12,349	11,854	11,257
Total domestic waste generation	29,364	30,751	29,518	28,032
Domestic waste generation per capita	568	583	583	583
Overall domestic recovery rate	55%	60%	60%	60%

Waste generation per capita in Clarence Valley has remained fairly steady over the last eight years at around 570 kg per person (Figure 39), above the current regional average of 514 kg per capita.



Figure 39: Summary headline waste flows on a per capita basis - historic and projected (BAU)

5.4.2.2 Waste Characterisation

A 2017 audit found a high 63% of the residual bin could be recovered either through the organics bin (35%) or recycling bin (28%). On the other hand, performance in the FOGO bin was excellent, with almost no contamination (<1%), while the commingled bin also had low contamination at 5.8%, which was mostly residual waste.

5.4.3 Waste contracts and destinations

Kerbside collection of waste, recycling and organics are all managed by JR Richards. The company also processes kerbside recycling and FOGO under contract at the Council-owned facilities, while disposal is to the Council's Grafton Regional Landfill.
Table 24 Summary of waste destinations

Material / stream	Primary destination	Secondary reprocessing / end market
Residual waste	Grafton Regional Landfill	-
Garden organics	Grafton and Maclean WTS	Local community
Food and garden organics	Grafton ORF	Landscaping and farming
Paper / cardboard	Grafton MRF	Not Known
Plastics	Grafton MRF	Not Known
Glass	Grafton MRF	Not Known
Metal packaging	Grafton MRF	Not Known
Scrap metal & whitegoods	Grafton Landfill	Sell & Parker
E-waste	Grafton / Maclean CRCs	Managed by Cleanaway under contract to EPA
Recovered C&D aggregates	Grafton Landfill	Operational use at the landfill
Recovered soils	Grafton Landfill	Operational use at the landfill
Timber	Grafton Landfill	Not known
Tyres	Grafton Landfill	Not Known
Mattresses	Grafton Landfill	Macleay Options Inc

5.4.4 Current needs and future potential

There is no landfill airspace issues in Clarence Valley, with 50+ years of remaining life in Grafton Regional Landfill. The main constraint in the region is the lack of end markets and sufficient economies of scale to whet industry appetite and attract competitive prices.

Grafton Regional Landfill is a potential future site for a regional facility for the North Coast. The site is 187 hectares and includes a landfill, multiple waste processing facilities and good linkages to transport both north and south.

5.5 Coffs Harbour City Council

5.5.1 Overview

The compact local government area (1,175km²) is located near the centre of the study area's coastal extent.

Half of the LGA is reserves, national parks and state forest. The region was once an agricultural centre and has since evolved into a busy coastal hub with expanding economies based on tourism, retail, creative industries, manufacturing and construction

It is relatively densely settled for the region (63 people / km^2) and projected for a 16.4% increase in the population over 20 years to 2036, the highest of all North Coast councils.

There is a higher number of older workers and preretirees and older in comparison to rest of regional NSW.

Key characteristics

Main industries:

- Tourism, with over 1.6 million visitors annually, mostly to the city of Coffs Harbour
- Timber production and banana growing

Income distribution skews lower than the NSW average

92.7% employment in full or part time work (NSW average: 98%)

61% of households are privately owned (NSW average: 63.5%).

5.5.2 Waste stream characterisation

This section further investigates the MSW stream in Coffs Harbour based on analysis of the Council's most recent WARR report (2018/19) and responses to a survey for this project.

5.5.2.1 Waste Flows

Coffs Harbour MSW generation in 2018-19 was 39,000 tonnes or 11.6% of total North Coast domestic waste, making it the fourth largest generator within the region. Its recovery rate was a high 63%, well above the 57% regional average.

Figure 40 provides an overview of waste flows by stream. The recovery rate has been supported by the Biomass Solutions MBT facility processing residual waste, converting the organic faction into mixed waste organics outputs (MWOO). The performance of the facility has always fluctuated, but AWT recovery in 2018/19 decreased significantly due to the NSW EPA regulatory changes on applying MWOO to land, with recovery falling from 5,718 tonnes in 2017-18 to just 433 tonnes in 2018-19.

The facility is not feasible to function as designed due to the MWOO regulatory changes, which undercut the business model based on diversion from landfill to a low cost offtake. However, it is assumed in the base case modelling that it will be reconfigured to continue delivering its contracted diversion rate. The underpinning data is provided in Table 25.



Figure 40: Summary of major waste flows – historic and projected (BAU)

Table 25: Current domestic waste breakdown and future BA	BAU projections (no change in recovery)
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Parameter	Current volumes	BAU	BAU Future Projections		
	2018-19	2029-30	2039-40	2049-50	
Kerbside recycling (recovered)	7,015	7,833	8,186	8,481	
Drop-off recycling (recovered)	4,981	2,481	2,593	2,686	
Clean-up recycling	57	79	83	86	
Drop-off HH Haz recycled	-	42	44	45	
CDS recycling (in LGA)	-	287	300	311	
Total recycling	12,053	10,721	11,205	11,608	
Kerbside organics (GO+FOGO)	10,540	11,670	12,197	12,635	
Drop off Organics	1,594	1,559	1,630	1,688	
Other Council Garden Organics	-	-	-	-	
Total organics recovered	12,134	13,229	13,827	14,324	
AWT recovery of residual waste	433	2,556	2,672	2,768	
Total recovery	24,621	26,507	27,703	28,699	
Kerbside residual waste to landfill	12,529	11,786	12,318	12,761	
Drop-off residual waste to landfill	-	2,699	2,821	2,923	
Clean-up waste disposed	909	1,499	1,567	1,623	
Total recovery residuals disposed	1,097	1,829	1,911	1,980	
Total residual to landfill	14,535	17,814	18,618	19,287	
Total domestic waste generation	39,050	44,320	46,321	47,986	
Domestic waste generation per capita	506	526	526	526	
Overall domestic recovery rate	63%	60%	60%	60%	

Waste generation per capita was 506 tonnes in 2018-19 (Figure 41), just above the current regional average of 514 kg per capita per year (Table 5).



Figure 41: Summary headline waste flows on a per capita basis – historic and projected (BAU)

5.5.2.2 Waste Characterisation

An audit in 2017 shows that over half of what is disposed within the residual bin could be recycled, most of which is FOGO (40.6%).

The organics bin had a very low contamination rate of 1.5%. The recycling bin had a contamination rate of 18.6%, which was made up of an array of materials including mixed glass and glass fines, other steel (i.e. non-packaging) and contaminated or soiled paper.

5.5.3 Waste contracts and destinations

Kerbside collection and processing for waste, recycling and organics are jointly procured with Bellingen and Nambucca councils. Handybin Waste Services provides the three collection services and processes kerbside recycling, under contract until 2027.

Biomass Solutions manages the organics processing and AWT processing of residual MSW. However, regulatory changes in 2019 that removed permission for MBTs to apply their mixed waste organics outputs (MWOO) to land has created significant uncertainty about the future of this facility. It is currently processing waste and organics but sending the main outputs to landfill as there is no approved alternative.

Coffs Harbour City Council manages disposal of MSW residuals to landfill, including from the MRF, MBT and self-haul drop-off waste from residents.

Table 26: Summary of waste destinations

Material / stream	Primary destination	Secondary reprocessing / end market
Residual waste	Englands Road Waste Management Facility (WMF)	-
Garden organics	Coffs Coast Resource Recovery Park (RRP)	Compost market
Food and garden organics	Coffs Coast RRP	Compost market
Paper and cardboard	Coffs Harbour MRF	Reprocessors
Plastics	Coffs Harbour MRF	Reprocessors
Glass	Coffs Harbour MRF	Remanufactured into recovered glass sand (RRO)
Metal packaging	Coffs Harbour MRF	Reprocessors
Scrap metal & whitegoods	Englands Road WMF	Reprocessors
E-waste	Englands Road WMF	Reprocessors
Recovered C&D aggregates	Englands Road WMF	Road and hardstand construction
Recovered soils	Englands Road WMF	Operational use at the landfill
Timber	Englands Road WMF	Operational use at the landfill
Tyres	Englands Road WMF	Reprocessors
Mattresses	Englands Road WMF	Reprocessors

5.5.4 Current needs and future potential

The expected closure of the landfill at the Englands Road Waste Management Facility in 2022 poses a significant challenge for Coffs Harbour and neighbouring councils. The MWOO regulatory reforms will likely bring the closure date forward as product outputs from the Biomass Solutions facility will be disposed to Englands Road landfill with only minor sorting of recyclables and stabilisation of the waste to landfill. No sites were identified in the returned survey for development as a regional facility.

5.6 Kempsey Shire Council

5.6.1 Overview

The 3,381km² Kempsey Shire sits in the southern half the study area. The mid-sized LGA is predominately rural, with a low population density of 8.70 people per km², which is projected to fall moderately over the next 20 years, from a population of 29,431 in 2016 to 28,986 people in 2036, a 3.13% decrease.

Kempsey is predominately rural, including dairy farming, timber production, horticulture and fishing. The area is driven by many industries including beef cattle production and tourism.

Livestock slaughtering's had the highest value in terms of agricultural production (46.3%), followed by dairy (18.3%) and other fruit (13.6%).

5.6.2 Waste stream characterisation

Key characteristics

Main industries:

- Beef cattle production
- Tourism, with an average of 540,000 visitors per year
- Dairy farming, timber, horticulture and fisheries

Income distribution skews lower than the NSW average

91.4% employment in full or part time work (NSW average: 98%)

65% of households are privately owned (NSW average: 63.5%)

This section further investigates the MSW stream in Kempsey based on analysis of the Council's most recent WARR report (2018/19) and responses to a survey for this project.

5.6.2.1 Waste Flows

Kempsey generated nearly 4.4% of the region's MSW in 2018-19, at 14,850 tonnes. Its moderate 53% recovery rate was comparable to the region average 57%. Figure 42 provides an overview of past and projected waste flows by stream. It reveals a number of one-off spikes in volume across multiple streams, in drop-off recycling (2015-16), drop-off residual waste (2016-17) and kerbside organics (2017-18). The underpinning data is provided in Table 27.



Figure 42: Summary of major waste flows - historic and projected (BAU)

Table 27: Current domestic waste breakdown and future BAU projections (no change in recovery)

Parameter	Current volumes	BAU Future Projections		
	2018-19	2029-30	2039-40	2049-50
Kerbside recycling (recovered)	2,024	2,374	2,316	2,240
Drop-off recycling (recovered)	1,706	1,711	1,668	1,614
Clean-up recycling	-	-	-	-
Drop-off HH Haz recycled	-	11	11	10
CDS recycling (in LGA)	-	74	72	70
Total recycling	3,730	4,170	4,067	3,934
Kerbside organics (GO+FOGO)	3,439	3,045	2,970	2,873
Drop off Organics	349	628	612	592
Other Council Garden Organics	-	-	-	-
Total organics recovered	3,788	3,672	3,582	3,465
AWT recovery of residual waste	321*	-	-	-
Total recovery	7,839	7,842	7,649	7,399
Kerbside residual waste to landfill	4,591	5,060	4,936	4,774
Drop-off residual waste to landfill	2,159	3,135	3,058	2,958
Clean-up waste disposed	-	-	-	-
Total recovery residuals disposed	263	311	303	294
Total residual to landfill	7,013	8,507	8,297	8,026
Total domestic waste generation	14,852	16,349	15,946	15,425
Domestic waste generation per capita	501	557	557	557
Overall domestic recovery rate	53%	48%	48%	48%

* It is not clear why AWT recovery is included in 2018/19 WARR return, but retained pending clarification.

Waste generation per capita in Kempsey was 501 kg in 2018-19 (Figure 43), which is similar to the regional average of 514 kg per capita.



Figure 43: Summary headline waste flows on a per capita basis – historic and projected (BAU)

5.6.2.2 Waste Characterisation

A large proportion of the residual waste stream could be recycled, based on a 2017 audit that found nearly half of the bin contents were FOGO and almost 15% were either recyclable or potentially recyclable with the right processes in place.

The organics bin had almost no contamination (<1%), a good result against other NSW councils, while the commingled bin had a contamination rate of 18.7%, mostly mixed glass and glass fines. The container deposit scheme may have reduced this contamination rate by diverting glass bottle.

5.6.3 Waste contracts and destinations

Cleanaway holds the contract for kerbside collection of waste, recycling and organics until 2028. Processing of recyclables and organics is undertaken at Port Macquarie Hastings Council's Cairncross recovery precinct, with JR Richards contracted to operate the MRF and Remondis contracted to operate the organics recovery facility.

Table 28: Summary of waste destinations

Material / stream	Primary destination	Secondary reprocessing / end market
Residual	Kempsey Waste Management Centre (WMC)	-
Garden organics	Cairncross Organic Resource Recovery Facility (ORRF)	Remondis sales, Cairncross
Food and garden organics	Cairncross ORRF	Remondis sales, Cairncross
Paper and cardboard	Cairncross MRF	NSW paper mills
Plastics	Cairncross MRF	Victorian processors
Glass	Cairncross MRF	Processed locally for commercial applications
Metal packaging	Kempsey WMC – Transfer Station	Matthews Metal
Scrap metal & whitegoods	Kempsey WMC – Transfer Station	Matthews Metal
E-waste	Kempsey WMC – Transfer Station	Matthews Metal
Recovered C&D aggregates	Kempsey WMC – Transfer Station	Sell to community and use on Council projects
Recovered soils	Kempsey WMC	Operational use at the landfill
Timber	Kempsey WMC	Mulch for operational use at the landfill / provision to public
Tyres	Kempsey WMC – Transfer Station	Tyre Power
Mattresses	Kempsey WMC – Transfer Station	Macleay Options reprocesses at the facility

5.6.4 Current needs and future potential

With the headline recovery streams managed outside the LGA, residuals are disposed at the Kempsey Waste Management Centre landfill, which has an annual capacity of 25,000 tonnes. Only half of that was annual limit was used in 2017-18. The main constraint in the region is the lack of end markets and sufficient economies of scale to attract industry investment and competitive prices.

No future sites in Kempsey were identified for potential development.

5.7 Kyogle Council

5.7.1 Overview

Kyogle is on the far North Coast, bounded by the Queensland border to the north and inland from Ballina. The mid-sized LGA covers an area of 3,589 km², around 30% of which is state forest or national park.

It features a diverse population of rural and village-based communities, with the lowest population density in the North Coast region at 2.54 people per km², which informs some of Kyogle's waste service options.

The population is projected to decrease by a significant 20.66% over 20 years, falling from 9,114 in 2016 to 7,710 people in 2036.

Kyogle is an established agricultural area. The largest proportion of residents worked in

Key characteristics

Main industries:

- Agriculture, specifically beef and dairy cattle
- Non-traditional farming (multicropping, organic and technology driven)
- Fishing

Income distribution skews lower than the NSW average

91.3% employment in full or part time work (NSW average: 98%)

68% of households are privately owned (NSW average: 63.5%).

agriculture, forestry and fishing (18.6%), followed by health care and social assistance (14.5%) and then retail trade (9.3%). The most common produce is beef and dairy cattle, timber production and some vegetable and grain growing.

5.7.2 Waste stream characterisation

This section further investigates the MSW stream in Kyogle based on analysis of the Council's most recent WARR report (2018/19) and responses to a survey for this project.

5.7.2.1 Waste Flows

In 2018-19, Kyogle generated 3,392 tonnes of MSW, the smallest volume across the region at 1% of total generation. It recorded a recovery rate of 42%, significantly below the average for the region of 57%, in part as it is the only Council without kerbside organics collection. Figure 44 provides an overview of generation by stream, with a high proportion of drop-off waste and recycling, which is expected to continue. The underpinning data is provided in Table 29.



Figure 44: Summary of major waste flows – historic and projected (BAU)

Table 29: Current domestic waste breakdown and future BA	AU projections (no change in recovery)
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Parameter	Current volumes	BAU	BAU Future Projections		
	2018-19	2029-30	2039-40	2049-50	
Kerbside recycling (recovered)	378	365	326	285	
Drop-off recycling (recovered)	880	1,058	943	827	
Clean-up recycling	-	-	-	-	
Drop-off HH Haz recycled	-	-	-	-	
CDS recycling (in LGA)	-	15	13	12	
Total recycling	1,258	1,438	1,282	1,124	
Kerbside organics (GO+FOGO)	-	-	-	-	
Drop off Organics	166	142	127	111	
Other Council Garden Organics	-	-	-	-	
Total organics recovered	166	142	127	111	
AWT recovery of residual waste	-	-	-	-	
Total recovery	1,424	1,580	1,409	1,235	
Kerbside residual waste to landfill	931	917	818	717	
Drop-off residual waste to landfill	1,037	1,248	1,113	975	
Clean-up waste disposed	-	-	-	-	
Total recovery residuals disposed	-	11	10	8	
Total residual to landfill	1,968	2,176	1,940	1,701	
Total domestic waste generation	3,392	3,756	3,348	2,936	
Domestic waste generation per capita	385	457	457	457	
Overall domestic recovery rate	42%	42%	42%	42%	

Kyogle's low overall domestic waste generation is in part based on low waste generation per capita (Figure 45), with 385 kg per person in 2018-19 sitting well below the regional average of 514 kg per capita. Again, this reflects the absence of a kerbside organics service, primarily due to the low population density to underpin the option.



Figure 45: Summary headline waste flows on a per capita basis – historic and projected (BAU)

5.7.2.2 Waste Characterisation

No audit data was provided for Kyogle.

5.7.3 Waste contracts and destinations

Kerbside collection for waste and recycling is serviced by Solo Resource Recovery, which also manages the kerbside recycling processing. There is no collection for organics. Organics processing is managed by MI Organics on a campaign basis.

Table 30: Summary of waste destinations

Material / stream	Primary destination	Secondary reprocessing / end market
Residual	Kyogle Landfill Facility	-
Garden organics	Kyogle Landfill Facility	No data provided
Food and garden organics	N/A	-
Paper and cardboard	Polytrade Recycling, Chinderah	Remanufacturers (e.g. Visy. Orora)
Plastics	Polytrade Recycling, Chinderah	Domestic reprocessors / remanufacturers and export
Glass	Polytrade Recycling, Chinderah	Sort glass cullet sent to OI in Victoria and NSW
Scrap metal & whitegoods	Lismore Metal Recyclers, Lismore	No data provided
E-waste	Kyogle Landfill Facility – CRC	Managed by Cleanaway under contract to EPA
Tyres	S&J Australian Scrap Tyre	Used for retread or processed by Chip Tyre into crumbed rubber.
Mattresses	Kyogle Landfill Facility	No data provided

5.7.4 Current needs and future potential

Kyogle Landfill Facility has more than 50 years remaining life, however there is a need to preserve airspace as surrounding councils have limited remaining landfill life and may need to utilise the Kyogle facility, at the least for hazardous wastes such as asbestos.

No sites were identified in the Kyogle LGA for development as a regional facility.

5.8 Lismore City Council

5.8.1 Overview

Lismore is situated in the far North Coast and covers a compact area of 1,290km²,

It combines rural and urban areas, with more than 60% of the population living in the towns, which increases the density to 34.20 people per km².

The population of 44,122 in 2016 is projected to decrease by 0.2% over 20 years, to 44,213 people in 2036.

The regional city of Lismore is continuing to grow, including expansion of university facilities, hospital service upgrades and a growth in cottage industries that focus on the region's food, art and natural products²².

Key characteristics

Main industries:

- Nut growing, specifically macadamias
- Dairy farming
- Tourism, with around 700,000 visitors annually

Income distribution skews lower than the NSW average

92.2% employment in full or part time work (NSW average: 98%)

63% of households are privately owned (NSW average: 63.5%).

5.8.2 Waste stream characterisation

This section further investigates the MSW stream in Lismore based on analysis of the Council's most recent WARR report (2018/19) and responses to a survey for this project.

5.8.2.1 Waste Flows

At 31,000 tonnes in 2018-19, Lismore generated 9.1% of the regional total, sixth largest out of the 13 councils. It achieved a very high recovery rate of 66%, the third highest in the region and well above the 57% average recovery. Notably, this is without the Biomass Solutions facility processing residual waste, but includes high levels of drop-off for recovery.

Figure 46 provides an overview of past flows by stream, including spikes in drop-off waste and recycling streams in 2018-19, and projected waste flows based on population growth. The underpinning data is provided in Table 31.



Figure 46: Summary of major waste flows - historic and projected (BAU)

²² https://issuu.com/lismorecitycouncil/docs/imagine_lismore_community_strategic?e=7144101/51081481

Parameter	Current volumes	BAU Future Projections			
	2018-19	2029-30	2039-40	2049-50	
Kerbside recycling (recovered)	3,150	4,641	4,429	4,176	
Drop-off recycling (recovered)	10,356	5,230	4,992	4,706	
Clean-up recycling	-	-	-	-	
Drop-off HH Haz recycled	-	24	23	22	
CDS recycling (in LGA)	-	183	174	164	
Total recycling	13,506	10,078	9,618	9,068	
Kerbside organics (GO+FOGO)	4,843	5,806	5,541	5,224	
Drop off Organics	1,875	2,992	2,856	2,692	
Other Council Garden Organics	-	86	82	77	
Total organics recovered	6,718	8,884	8,479	7,993	
Total recovery	21,537	18,962	18,096	17,061	
Kerbside residual waste to landfill	5,707	5,620	5,363	5,056	
Drop-off residual waste to landfill	4,755	2,547	2,431	2,291	
Clean-up waste disposed	-	-	-	-	
Total recovery residuals disposed	-	88	84	80	
Total residual to landfill	10,462	8,255	7,878	7,428	
Total domestic waste generation	30,686	27,217	25,975	24,488	
Domestic waste generation per capita	694	601	601	601	
Overall domestic recovery rate	66%	70%	70%	70%	

Table 31: Current domestic waste breakdown and future BAU projections (no change in recovery)

Lismore's waste generation per capita has climbed steadily since 2014-15 to 694 kg in 2018-19 (Figure 47), sitting well above the regional average of 514 kg per capita. This is forecast to fall over time to more closely align regional generation trends. The high waste generation rate may be due to the fact that Lismore receives waste on a regional basis and the data may include waste materials from other council areas.



Figure 47: Summary headline waste flows on a per capita basis – historic and projected (BAU)

5.8.2.2 Waste Characterisation

A 2020 audit found a majority of the residual waste bin could be recycled, either via the FOGO service (37%) or commingled recycling (15%), despite the container deposit scheme²³. A much lower contamination rate was found in the recycling bin (8%). The organics bin had a low level of contamination (<4%).

5.8.3 Waste contracts and destinations

Northern Rivers Waste, which is a business unit of Lismore City Council, undertakes all domestic collections and manages the waste facilities.

²³ Household Kerbside Bin System Audit, 2019, EC Sustainable

Table 32: Summary of waste destinations

Material / stream	Primary destination	Secondary reprocessing / end market
Residual	Lismore Recycling & Recovery Centre (RRC)	-
Garden organics	Lismore RRC	Local market
Food and garden organics	Lismore RRC	Local market
Paper and cardboard	Lismore MRF	Reprocessors and exported
Plastics	Lismore MRF	Reprocessors and exported
Glass	Lismore MRF	Local market
Metal packaging	Lismore MRF	Reprocessors and exported
Scrap metal & whitegoods	Reseller	No information provided
E-waste	ANZRP	No information provided
Recovered C&D aggregates	Local markets / site use	No information provided
Recovered soils	Lismore RRC	Operational use at the landfill
Timber	Lismore RRC	Second hand shop/landfill
Tyres	Tyre cycle	No information provided
Mattresses	Lismore RRC	-

5.8.4 Current needs and future potential

In 2019 a fire in the Lismore Recycling & Recovery Centre did significant damage to the organics processing facility and neighbouring MRF, which remains offline nine months later. Initial assessment indicated the downtime could be up to 12 months.

The Lismore MRF is also undergoing a glass plant upgrade this financial year, which will help with glass processing capacity in the region.

Lismore is currently investigating new landfill sites within the LGA, one of which is the Blakebrook Quarry which could serve as a regional landfill with a potential capacity of 4,000,000tonnes. A potential site for a regional energy from waste facility is the former Three Chain Road Quarry (144 Three Chain Rd, Lismore). The former quarry has a large floor area and is located near an industrial area, sewerage plant and substation. It is not in a flood zone. The Lismore Recycling and Recovery Centre in East Lismore has development potential for a regional MRF.

5.9 MidCoast Council

5.9.1 Overview

MidCoast Council was formed through the 2017 amalgamation of Gloucester, Great Lakes and Greater Taree councils, creating the second largest LGA by area (10,060km²).

It sits at southern end of the North Coast region, with a high level of access to the waste facilities and end markets of the Hunter region.

While predominantly rural, and encompassing 58 national parks and reserves, MidCoast had a significant population of 91,801 in 2016, with a projected increase of 9.03% over 20 years, to 99,962 people.

Despite its population size and several large towns

Key characteristics

Main industries:

- Timber production, primarily dairy and beef cattle
- Coal mining
- Tourism, with an average of 2.1 million visitors annually

Income distribution skews lower than the NSW average

91% employment in full or part time work (NSW average: 98%)

with industrial and commercial land use, population density is in the lower cohort of the North Coast councils at 9.13 people per km².

Much of the rural area is used for timber production and farming, primarily dairy and beef cattle with a growing poultry and viticulture industries.

5.9.2 Waste stream characterisation

This section further investigates the MSW stream in MidCoast based solely on analysis of the Council's most recent WARR report (2018/19).

5.9.2.1 Waste Flows

MidCoast is the biggest generator of MSW in the region at 55,614 tonnes, nearly 16.4% of total North Coast generation. It has a relatively low recovery rate of 47% compared to the regional average of 57%. Figure 48 provides an overview of waste flows by stream, with a notably high proportion of kerbside residual waste. The underpinning data is provided in Table 31.



Figure 48: Summary of major waste flows – historic and projected (BAU)

Table 33: Current domestic waste breakdown and future BAL	J projections ((no change in recovery	1)
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Parameter	Current	BAU Future Projections		
	2018-19	2029-30	2039-40	2049-50
Kerbside recycling (recovered)	6,507	9,274	9,387	9,411
Drop-off recycling (recovered)	5,118	5,005	5,066	5,079
Clean-up recycling	750	788	798	800
Drop-off HH Haz recycled	-	-	-	-
CDS recycling (in LGA)	-	189	192	192
Total recycling	12,375	15,256	15,443	15,481
Kerbside organics (GO+FOGO)	9,758	10,032	10,154	10,180
Drop off Organics	3,777	3,759	3,805	3,815
Other Council Garden Organics	-	-	-	-
Total organics recovered	13,535	13,791	13,959	13,994
AWT recovery of residual waste	-	-	-	-
Total recovery	25,910	29,047	29,402	29,476
Kerbside residual waste to landfill	19,994	21,480	21,742	21,797
Drop-off residual waste to landfill	5,680	5,826	5,897	5,912
Clean-up waste disposed	1,250	1,751	1,772	1,777
Total recovery residuals disposed	2,781	2,015	2,039	2,044
Total residual to landfill	29,704	31,071	31,451	31,529
Total domestic waste generation	55,614	60,118	60,853	61,005
Domestic waste generation per capita	592	608	608	608
Overall domestic recovery rate	47%	48%	48%	48%

Waste generation per capita in MidCoast had a broadly downward trend in the seven years to 2017-18, before slightly rebounding in 2018-19 to 592 kg per capita per year (Figure 49). This is above the current regional average of 514 kg.



Figure 49: Summary headline waste flows on a per capita basis - historic and projected (BAU)

5.9.2.2 Waste Characterisation

There have been no audits since MidCoast Council was formed in 2017, so individual audits from each of the three former councils in February 2017 have been aggregated to approximate the waste characterisation.

Across the three audits, it was found that almost 60% of the residual bin could have been recovered, notably through the FOGO bin (45%) and the recycling bin (14%). The organics bin had almost no contamination at 0.65%, while the recycling bin was found to be 16% contaminated, mostly with other waste but also mixed glass and glass fines (before the CDS).

5.9.3 Waste contracts and destinations

No survey was supplied listing MidCoast Council's current contracts and the destinations of its waste streams.

5.9.4 Current needs and future potential

As above, no further data was provided to support assessment of the LGA's current and future needs.

5.10 Nambucca Shire Council

5.10.1 Overview

Nambucca is a compact LGA covering 1,491km² in the middle of the North Coast study area.

It is divided into two areas topographically, the western area of steep hill slopes and valleys and the eastern slopes, Nambucca River, floodplains and undulating lands²⁴.

It had a population of 19,580 in 2016 and a projected population of 20,622 in 2036, which is a 5.75% increase.

The recent Pacific Highway upgrade has made the Shire an easy commute to the regional centres of Coffs Harbour and Port Macquarie.

The prominent industries include manufacturing, aquaculture and tree crops such as macadamias,

Key characteristics

Main industries:

- Manufacturing
- Aquaculture
- Tree crops, specifically macadamias
- Tourism, with an average of 254,000 visitors annually

Income distribution skews lower than the NSW average

88.5% employment in full or part time work (NSW average: 98%)

60.4% of households are privately owned (NSW average: 63.5%).

which have replaced traditional industry such as dairying, timber, grazing, and horticulture. Service industries also play a vital role and include tourism, aged care and health services.

5.10.2 Waste stream characterisation

This section further investigates the MSW stream in Nambucca based on analysis of the Council's most recent WARR report (2018/19) and responses to a survey for this project.

5.10.2.1 Waste Flows

Nambucca generated 2.3% of North Coast MSW in 2018-19, or 7,700 tonnes. Analysis if its WARR return produces a recovery rate of 96%, which is the highest rate in the region by a significant margin.

Figure 50 provides an overview of waste flows by stream, including the significant proportion of residual waste processed by the Biomass Solutions facility in neighbouring Coffs Harbour. However, the 2017/18 and 2018/19 data points for AWT recovery are outliers, suggesting a 95% recovery rate from AWT, as opposed to an expected 40-50% recovery from historical data of other councils²⁵. An adjust will not have a material impact on the overall regional recovery, given the relatively small scale of tonnes in Nambucca, but does impact the relative performance between Councils. As an example, if the AWT recovery was at 50%, this would result in an overall recovery rate of 80%, 16 percentage points below the published recovery rate.

Further, it is assumed in the base case that the facility will be reconfigured to maintain its diversion performance, despite the 2018 regulatory reforms closing end markets for the key mixed waste organic outputs (MWOO). The underpinning data is provided in Table 34.

²⁴ https://www.nambucca.nsw.gov.au/page.asp?f=RES-DCL-30-23-05

²⁵ An assumption could be made that the AWT input tonnage was recorded instead of the recovered tonnage.



Figure 50: Summary of major waste flows – historic and projected (BAU)

Parameter	Current volumes	BAU Future Projections		
	2018-19	2029-30	2039-40	2049-50
Kerbside recycling (recovered)	1,562	1,802	1,829	1,843
Drop-off recycling (recovered)	1,149	742	753	759
Clean-up recycling	-	-	-	-
Drop-off HH Haz recycled	-	-	-	-
CDS recycling (in LGA)	-	29	30	30
Total recycling	2,710	2,574	2,612	2,633
Kerbside organics (GO+FOGO)	2,708	2,691	2,730	2,752
Drop off Organics	209	145	147	148
Other Council Garden Organics	-	-	-	-
Total organics recovered	2,917	2,836	2,878	2,901
AWT recovery of residual waste	1,776	1,969	1,997	2,013
Total recovery	7,402	7,379	7,487	7,547
Kerbside residual waste to landfill	105	833	845	852
Drop-off residual waste to landfill	59	20	21	21
Clean-up waste disposed	50	164	167	168
Total recovery residuals disposed	82	243	246	248
Total residual to landfill	296	1,260	1,278	1,289
Total domestic waste generation	7,700	8,639	8,765	8,836
Domestic waste generation per capita	388	424	424	424
Overall domestic recovery rate	96%	85%	85%	85%

Table 34: Current domestic waste breakdown and future BAU projections (no change in recovery)

Waste generation per capita in Nambucca fell moderately over seven years to 2017-18, before an increase in 2018-19 to 467 kg (Figure 51). However, this result remains below the regional average of 514 kg.



Figure 51: Summary headline waste flows on a per capita basis – historic and projected (BAU)

5.10.2.2 Waste Characterisation

An audit in 2017 shows that over half of the residual bin could be recycled, either through the FOGO bin (36%) or via the comingled bin (17%). The organics bin had a very low contamination rate of 2.3%. It also found that 19.5% of the recycling bin was contamination, mostly made up of mixed glass and glass dines, as well as contaminated and soiled paper.

5.10.3 Waste contracts and destinations

Nambucca is in a tripartite agreement with Coffs Harbour and Bellingen that covers all domestic collection and processing/disposal contractors. Handybin Waste Services collects all streams for delivery to the multi-facility Coffs Coast Resource Recovery Park, and processes kerbside recycling. Biomass Solutions provides the organics processing and AWT processing of residual waste.

Table 35 Summary of waste destinations

Material / stream	Primary destination	Secondary reprocessing / end market
Residual waste	Coffs Coast Resource Recovery Park (RRP)	Landfill
Garden organics	Coffs Coast RRP	Compost market
Food and garden organics	Coffs Coast RRP	Compost market
Paper and cardboard	Coffs Harbour MRF	Reprocessors
Plastics	Coffs Harbour MRF	Reprocessors
Glass	Coffs Harbour MRF	Remanufactured into recovered glass sand (RRO)
Metal packaging	Coffs Harbour MRF	Reprocessors
Scrap metal & whitegoods	Nambucca Waste Management Facility	Reprocessors
E-waste	Matthews Metal Management	Reprocessors
Recovered C&D aggregates	Not specified	Not specified
Recovered soils	Not specified	Not specified
Timber	Not specified	Not specified
Tyres	Not specified	Not specified
Mattresses	Macleay Options	Reprocessors

5.10.4 Current needs and future potential

Nambucca's Waste Management Facility includes a landfill which is only available for self-haul customers from within the LGA to conserve local disposal capacity. No sites were identified in the returned survey in the Nambucca LGA for development as a regional facility.

5.11 Port Macquarie-Hastings Council

5.11.1 Overview

Port Macquarie-Hastings is a mid-sized 3,687km² located in the southern half of the study area.

A large proportion of the LGA is state forest and national park, but the population density is above the regional average at 21.72 people per km².

Significant population growth is projected. The population of 80,073 in 2016 is projected to increase by 23.56% increase to 96,446 in 2036.

More residents worked in health care and social assistance than any other industry in 2016 (17.5%), followed by retail trade (11.5%) and construction (10.6%). Whereas, the number of residents employed in manufacturing is decreasing.

Key characteristics

Main industries:

 Tourism, with an average of 1.5million visitors annually

Income distribution skews lower than the NSW average

93.2% employment in full or part time work (NSW average: 98%)

65% of households are privately owned (NSW average: 63.5%).

5.11.2 Waste stream characterisation

The follow section is based on analysis of the Council's most recent WARR report (2018/19) and responses to a survey for this project.

5.11.2.1 Waste Flows

Port Macquarie-Hastings is the second largest MSW generator in the region despite being only the third most populous. It generated 53,184 tonnes in 2018-19, 15.7% of North Coast domestic waste. It achieved the North Coast average recovery rate of 57%.

Figure 52 overviews waste flows by stream, highlighting a relatively large proportion of drop-off material in all streams. The underpinning data is provided in Table 36.



Figure 52: Summary of major waste flows - historic and projected (BAU)

Parameter	Current BAU Future Projections		ons	
	2018-19	2029-30	2039-40	2049-50
Kerbside recycling (recovered)	8,223	8,852	9,422	9,911
Drop-off recycling (recovered)	5,174	4,833	5,144	5,411
Clean-up recycling	-	-	-	-
Drop-off HH Haz recycled	-	24	25	27
CDS recycling (in LGA)	-	162	172	181
Total recycling	13,396	13,871	14,764	15,530
Kerbside organics (GO+FOGO)	14,398	14,659	15,602	16,412
Drop off Organics	2,800	5,622	5,984	6,294
Other Council Garden Organics	-	-	-	-
Total organics recovered	17,197	20,281	21,587	22,706
AWT recovery of residual waste	-	-	-	-
Total recovery	30,594	34,152	36,351	38,236
Kerbside residual waste to landfill	10,578	11,672	12,423	13,068
Drop-off residual waste to landfill	9,217	11,600	12,347	12,987
Clean-up waste disposed	100	103	110	115
Total recovery residuals disposed	2,695	1,604	1,707	1,795
Total residual to landfill	22,590	24,979	26,586	27,965
Total domestic waste generation	53,152	59,131	62,937	66,201
Domestic waste generation per capita	632	639	639	639
Overall domestic recovery rate	58%	58%	58%	58%

Table 36: Current domestic waste breakdown and future BAU projections (no change in recovery)

Waste generation per capita in Port Macquarie is relatively stable (Figure 53), but at 632 kg in 2018-19 it is significantly higher than the regional average of 514 kg.



Figure 53: Summary headline waste flows on a per capita basis – historic and projected (BAU)

5.11.2.2 Waste Characterisation

A waste audit in 2017 found almost 60% of the residual bin contents could be recycled, either through the organics bin (45%) or the comingled bin (15%).

The organics bin had a very low contamination rate of 1.5%. The comingled bin had a contamination rate of just over 16%, which is mainly made up of mixed glass and glass fines, in addition to contaminated and soiled paper.

5.11.3 Waste contracts and destinations

JR Richards manages the kerbside collection of waste, recycling and organics, in addition to managing the processing of recyclables. Remondis manages the organics processing.

Table 37: Summary of waste destinations

Material / stream	Primary destination	Secondary reprocessing / end market
Residual	Cairncross Waste Management Facility	-
Garden organics	Cairncross ORRF	Remondis sales, Cairncross
Food and garden organics	Cairncross ORRF	Remondis sales, Cairncross
Paper and cardboard	Cairncross MRF	NSW paper mills
Plastics	Cairncross MRF	Victorian processors
Glass	Cairncross MRF	Processed locally at JR Richards, Tuncurry, for commercial applications
Metal packaging	Cairncross and transfer stations	SIMS Metals
Scrap metal & whitegoods	Cairncross and transfer stations	SIMS Metals
E-waste	Cairncross and transfer stations	Matthews Metal management
Recovered C&D aggregates	Cairncross Waste Management Facility	Reuse by Council
Tyres	Cairncross and transfer stations	Tyre cycle, Newcastle
Mattresses	Cairncross and transfer stations	Macleay Options, Kempsey

5.11.4 Current needs and future potential

The landfill at Port Macquarie recently received approval for +50 year expansion, which will provide regional stability for residual waste disposal. The Council identified the need for C&I and C&D recovery facilities, as well as a concrete crushing facility.

It also identified the Cairncross WMF as a high potential waste processing precinct. The Council has developed the site for ancillary waste activities, including building pads fully serviced to accommodate water, sewer, power and communications.

5.12 Richmond Valley Shire Council

5.12.1 Overview

Richmond Valley sits at the southern end of the far North Coast cluster of councils and is a mid-sized LGA with an area of 3,051 km².

The council had a population size of 23,256 in 2016, with a projected population of 23,862 in 2016, which is an increase in 1.81%.

It is primarily rural and rural-residential, with the largest town being Casino. Rural land is used largely for agriculture, particularly cattle grazing, sugar cane and wheat growing.

More residents worked in manufacturing than any other industry in 2016 at 14.7%, followed by health care and social assistance (13.6%) and then retail trade (10.2%). Interestingly though retail trade had a trend of decreasing between 2011 and 2016.

Key characteristics

Main industries:

- Agriculture, livestock
- Broadacre crops
- Dairy farming
- Tourism, with close to 350,000 visitors annually

Income distribution skews lower than the NSW average

92.2% employment in full or part time work (NSW average: 98%)

63% of households are privately owned (NSW average: 63.5%).

5.12.2 Waste stream characterisation

A deeper dive on the Richmond MSW stream is provided in the following section, including current and projected volumes, existing contracts and commentary distilled from Council feedback on new service and infrastructure needs. It is based on analysis of the Council's most recent WARR report (2018/19) and responses to a survey for this project.

5.12.2.1 Waste Flows

Richmond Valley generated 9,500 tonnes of MSW in 2018-19, less than 3% of domestic waste within the regional context. Its recovery rate of 54% is comparable to the regional average of 57%. Figure 54 provides an overview of past and projected waste flows by stream, with the forecast based on expected population growth. The underpinning data is provided in Table 38.



Figure 54: Summary of major waste flows - historic and projected (BAU)

Parameter	Current	BAU	Future Project	ions
Falameter	2018-19	2029-30	2039-40	2049-50
Kerbside recycling (recovered)	1,220	1,668	1,657	1,632
Drop-off recycling (recovered)	864	1,182	1,175	1,156
Clean-up recycling	-	-	-	-
Drop-off HH Haz recycled	-	4	4	4
CDS recycling (in LGA)	-	94	94	92
Total recycling	2,084	2,949	2,930	2,884
Kerbside organics (GO+FOGO)	2,828	3,092	3,071	3,024
Drop off Organics	206	563	559	551
Other Council Garden Organics	-	-	-	-
Total organics recovered	3,034	3,655	3,631	3,574
AWT recovery of residual waste	-	-	-	-
Total recovery	5,118	6,604	6,560	6,459
Kerbside residual waste to landfill	3,040	3,086	3,065	3,018
Drop-off residual waste to landfill	1,340	1,652	1,641	1,615
Clean-up waste disposed	-	25	25	24
Total recovery residuals disposed	-	36	36	35
Total residual to landfill	4,380	4,798	4,767	4,693
Total domestic waste generation	9,498	11,403	11,327	11,151
Domestic waste generation per capita	405	478	478	478
Overall domestic recovery rate	54%	58%	58%	58%

Table 38: Current domestic waste breakdown and future BAU projections (no change in recovery)

With waste generation per capita of 405 kg in 2018-19 (Figure 55), Richmond Valley is well below the regional average of 514 kg.



Figure 55: Summary headline waste flows on a per capita basis – historic and projected (BAU)

5.12.2.2 Waste Characterisation

An audit in late 2018 showed just over 67% of the residual waste bin could be recycled, of which 45% was organics, a high proportion of recoverable paper and a further 17% that could potentially be recycled, largely glass and plastic. The organics bin had a very low contamination rate of below 1%, while the recycling bin had a contamination rate of 14.1%.

5.12.3 Waste contracts and destinations

Council collects kerbside waste, recycling and organics using its own day labour crews. Kerbside recycling processing was undertaken at Lismore, but following the facility fire has shifted to Polytrade at Chinderah. Organics also used to be processed at the Lismore facility, but Council is planning to develop its own FOGO processing facility. In the interim, FOGO is being sent to a landfill in Queensland. Residual MSW is disposed at Veolia's Ti Tree Landfill.

Table 39: Summary of waste destinations

Material / stream	Primary destination	Secondary reprocessing / end market
Residual	Ti Tree Landfill (Qld)	-
Garden organics	Nammoona Waste Facility and Evans Head Transfer Station	Sold to the general public as pasteurised mulch
Food and garden organics	Ti Tree Landfill (Qld)	Sold to the general public as compost
Paper and cardboard	Lismore MRF	Reprocessors and exported
Plastics	Lismore MRF	Reprocessors and exported
Glass	Lismore MRF	Local market
Metal packaging	Lismore MRF	Reprocessors and exported
Scrap metal & whitegoods	Lismore MRF	Assume exported
E-waste	Contractor	Unknown
Recovered C&D aggregates	Nammoona Waste Facility	Operational use at the landfill
Recovered soils	Nammoona Waste Facility	Operational use at the landfill
Timber	Evans Head Transfer Station	Mulch sold to the general public
Tyres	Contractor	Unknown

5.12.4 Current needs and future potential

Landfill capacity is a major Council concern given limited space left at the council's only operating landfill, Nammoona. Additionally, asbestos disposal is also a concern as only a handful of facilities in and around the region accept it, resulting in high transport costs.

Council identified several potential future sites. The Bora Ridge Greenfield site at Myall Creek Rd has been identified as a potential future landfill site in past studies given minimal impact on surrounding properties. Another option is industrial land at Reynolds Road, Casino, which is close to rail and road infrastructure and industry as a potential end market offtake.

The major barriers to investing in local infrastructure has been the challenge to secure funding, the need for regional collaboration to achieve economies of scale, and lengthy development timeframes.

5.13 Tweed Shire Council

5.13.1 Overview

Tweed Shire is a compact 1,309km² and borders Queensland to the north. It encompasses rural areas, national parks, growing residential and rural-residential areas, and some commercial and industrial land use.

Tweed is the most populous of the North Coast Councils at 93,742 people in 2016, with a relatively high density of 71.61 people per km².

It is also undergoing significant change. The population is projected to grow to 109,444 in 2036, an increase in 18.98%.

That growth together with a growing number of tourists has resulted in a change from an

Key characteristics

Main industries:

- Tourism, with an average of 1.9 million visitors annually
- Agriculture, specifically broadacre crops which includes sugarcane

Income distribution skews lower than the NSW average

92.9% employment in full or part time work (NSW average: 98%)

65% of households are privately owned (NSW average: 63.5%).

economy historically dominated by agriculture to one now dominated by service sector industries (84%), and manufacturing and construction (12%).

The *Far North Coast Regional Strategy 2006–2031* (NSW Department of Planning) flags that the region is "facing major demographic changes", with the median age expected to rise from 39 to 51 years by 2031 and proportion of the population aged over 65 years expected to more than double.

5.13.2 Waste stream characterisation

This section further investigates the MSW stream in Tweed based on analysis of the Council's most recent WARR report (2018/19) and responses to a survey for this project.

5.13.2.1 Waste Flows

In 2018-19, Tweed Shire generated 46,000 tonnes of MSW, nearly 14% of waste across the region, making it the third largest generator. Its recovery rate of 54% is comparable to the regional average of 57%. Figure 56 provides an overview of past and projected waste flows by stream, with the forecast based on expected population growth. The underpinning data is provided in Table 40.

It is important to note that the MSW tonnages are inclusive of some commercial waste and recycling which are collected in the same trucks. Any future consideration of options for managing these streams would include these tonnages.



Figure 56: Summary of major waste flows – historic and projected (BAU)

Table 40: Current domestic waste breakdown and future BA	AU projections (no change in recovery)
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Parameter	Current volumes	BAU	Future Project	ions
	2018-19	2029-30	2039-40	2049-50
Kerbside recycling (recovered)	9,044	10,728	11,238	11,668
Drop-off recycling (recovered)	-	481	504	523
Clean-up recycling	-	-	-	-
Drop-off HH Haz recycled	-	-	-	-
CDS recycling (in LGA)	-	-	-	-
Total recycling	9,044	11,209	11,742	12,191
Kerbside organics (GO+FOGO)	12,013	13,220	13,849	14,378
Drop off Organics	3,970	4,300	4,505	4,677
Other Council Garden Organics	-	-	-	-
Total organics recovered	15,983	17,520	18,353	19,055
AWT recovery of residual waste	-	-	-	-
Total recovery	25,027	28,728	30,096	31,246
Kerbside residual waste to landfill	14,775	16,150	16,919	17,565
Drop-off residual waste to landfill	4,494	5,063	5,304	5,507
Clean-up waste disposed	1,129	-	-	-
Total recovery residuals disposed	822	-	-	-
Total residual to landfill	21,220	23,581	24,703	25,647
Total domestic waste generation	46,247	52,309	54,799	56,892
Domestic waste generation per capita	475	493	493	493
Overall domestic recovery rate	54%	55%	55%	55%

Waste generation per capita in Tweed has fluctuated with a slight decline in residual waste volumes in recent years (Figure 57). At 462 kg per capita in 2018-19, per capita generation in Tweed is below the regional average of 514 kg.



Figure 57: Summary headline waste flows on a per capita basis – historic and projected (BAU)

5.13.2.2 Waste Characterisation

A recent audit in 2019 found almost 45% of residual bin contents could have been recycled, either through the organics bin (25%) or through the comingled bin (20%). The organics bin had a low contamination rate of 2.5%, while the recycling bin had a higher contamination rate of 8.7%.

5.13.3 Waste contracts and destinations

Solo Resource Recovery services the kerbside collection of waste, recyclables, in addition to recycling processing. Organics processing is currently managed by Phoenix Power Recyclers in Queensland, however Council awarded Soilco the contract to design, construction and operate a FOGO processing facility at the Stotts Creek Resource Recovery Centre. This contract is due to expire in 2031 (actual data is dependent on the facility commissioning date). Veolia manages bulk haulage and disposal of residual waste to Ti Tree Landfill.

Table 41: Summary of waste destinations

Material / stream	Primary destination	Secondary reprocessing / end market
Residual	Ti Tree Landfill, Qld	-
Garden organics	Stotts Creek Resource Recovery Centre (RRC)	Mulch
Food and garden organics	Phoenix Power Recyclers	Composted into a commercial product
Paper and cardboard	Polytrade, Chinderah MRF	Remanufacturers (e.g. Visy. Orora)
Plastics	Polytrade, Chinderah MRF	Domestic reprocessors / remanufacturers and export
Glass	Polytrade, Chinderah MRF	Sort glass cullet sent to OI in Victoria and NSW
Metal packaging	Stotts Creek RRC	Scrap metal market
Scrap metal & whitegoods	Stotts Creek RRC	Metal Salvage at market value
E-waste	Stotts Creek RRC	Tech Collect
Recovered C&D aggregates	Stotts Creek RRC	Local C&D markets, landscaping, TSC engineering & operational use at the landfill (road construction and hardstand pavements)
Recovered soils	Stotts Creek RRC	Blended with mulch to make compost
Timber	Stotts Creek RRC	Mulch and Compost
Tyres	Stotts Creek RRC	S&J Australian Scrap Tyre to be used for retread or processed by Chip Tyre into crumbed rubber
Mattresses	Stotts Creek RRC	N/A

5.13.4 Current needs and future potential

The Council identified landfill capacity as a major concern, as well as a lack of recycling processing options and declining commodity prices for recyclate.

Council has a 'Zero Waste Target', which is a key driver of its waste options, and has more than 15 years landfill capacity left. It identified opportunities to build local and regional circular economy:

• Extended Producer Responsibility and supporting local C&I, C&D sectors to identify circular economy opportunities for their operations
- Procurement policies for LGAs and local businesses that include circular economy principles. Business planning support that incorporates circular economy policies and scales up circular economy practices
- Develop a regional circular economy directory/resource that facilitates circular economy opportunities and logistics e.g. one organisations waste/output may be another organisation's resource input. Supporting these connections and measuring success in the region.

Council also identified the main constraints around future sites, which included the extensive capital costs, political pressures, gaining a social licence to operate, the uncertainty around market forces and the difficulty in obtaining approvals.

6 C&I AND C&D WASTE

Arcadis undertook a targeted consultation with the primary private sector waste contractors across the North Coast to shed some light on their current operations and waste flows, including any knowledge of end markets.

We have distilled feedback on key challenges (Section 6.1), while Section 6.2 and Section 1.1 tabulate individual company flows and facility usage.

6.1 Primary challenges

6.1.1 Costs and competition

The primary challenge identified by private contractors was the cost of recycling and responsibly disposing of waste. Rising labour and overhead costs mean time-consuming activities like sorting waste and 'doing the right thing' may not be viable, including for materials such as concrete and expanded polystyrene. There was a general sense that resource recovery operations are understaffed.

There is limited incentive for commingled recycling as the gate fee may be as little as \$10 per tonne cheaper than general waste in some areas. In addition, introduction of the container deposit scheme has reduced the quality of the commingled stream and companies are no longer getting the same return.

On the revenue side, there is a reluctance among companies to pay more for recycling services, based on limited appetite and a misconception as to how much it costs to recycle. Some respondents also noted that larger companies are undercutting prices to gain market share, which is making it more difficult for the smaller companies to survive.

Consideration of alternative services and facilities to increase recovery will need to factor in the high level of competition in the region.

6.1.2 Local infrastructure and end markets

The need for more local reprocessing infrastructure and end markets was highlighted in order to keep recyclables onshore and potentially within the local region, especially for plastics and glass.

While some export and long-hauling of recyclate will always be likely due to global commodity markets and the location of end market demand, some recyclables with local reuse opportunities are often hauled long distances due to limited local infrastructure.

Companies highlighted a number of specific issues:

- A shortage of C&I waste and plastics drop-off facilities for commercial businesses
- Gyprock was also highlighted as a potential material to recycle, but problematic given the need for dry storage. The nearest gyprock recycling options are in Ipswich (QId) and Wollongong
- Not much C&D waste is source separated anymore as builders lack any incentive
- The container deposit scheme requires companies to transport CDS material hours away to a designated NSW facility rather than across the border to Queensland
- Regional transport infrastructure needs to be considered.

6.1.3 Regulatory barriers and opportunities

Regulatory constraints are an inhibitor to recycling in some cases. Problem wastes such as asbestos and contaminated soil are very difficult to dispose locally and companies are forced to take it to Queensland or Sydney. Tight asbestos regulations have also seen the closure of smaller resource recovery facilities due to the risk profile, resulting in increased disposal to landfill.

Contractors also flagged inconsistencies between waste acceptance and procedures at landfills, with different rules on what can be recycled and how to recycle it.

Many contractors, especially the smaller operators, noted the NSW and local governments could do more to support local recycling infrastructure to meet emerging pressures and opportunities in the recycling system.

There was also a call for more community and business education on recycling and how to source separate waste, especially for the different types of plastics and commercial food.

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6.2 C&D waste contractors

Company	Region/s	Waste Co	llection (tpa)	Primary Destination(s)	End Markets
FE Marsh and Co	Kyogle and Lismore	C&D mixed waste	<20,000	 Second hand shops Online Offtake by sub-contractor Recycling centres Landfill 	Not visible to contractor
TNW Construction	Kyogle	C&D mixed waste C&D source separated waste (concrete, topsoil and steel)	<20,000	 Steel foes to Kyogle tip for recycling Concrete is stockpiled Topsoil may be taken to the quarry to be used as cover 	 Concrete is re-used by Council as road base Topsoil may be taken to a designated area for a council job e.g. cricket fields
Coffs Harbour Demolitions	Bellingen, most of the mid north coast and out to the west	C&D mixed waste C&D source separated waste (concrete, metals and timber)	20,000-40,000 (~20,000 is builders waste and ~ recyclable material)	 Wherever is closest. For example: Concrete to Golden Sands Metal to Sell and Parker Asbestos and contaminated soil goes to a Sydney landfill 	Not visible to contractor
Tweed Skips*	Tweed (also operates in SEQ)	C&D residual waste	<20,000	 Waste is taken to a landfill where recyclables are extracted: Stott's Creek Landfill (Tweed Council) Reedy Creek Landfill (Burleigh, Gold Coast Council) 	Not visible to contractor
Tweed Coast Demolitions	Tweed, Byron, Ballina, Lismore,	C&D source separated recycling (metals, concrete, timber, garden organics, asbestos)	<20,000	Various – depending on location, type and quantity. Mostly dispose of waste at Ipswich Landfill and Reedy Creek Landfill	Not visible to contractor

	Southern Gold Coast				
All Clear Demolitions*	Bellingen, Dorrigo, Grafton, Glen Innes, Port Macquarie etc.	C&D mixed waste C&D source separated recycling	<20,000	Will take to nearest tip depending on location (except Bellingen, as they do not have a weighbridge and therefore charge per sqm, which usually ends up being dearer)	Not visible to contractor
JR Richards*	MidCoast, Kempsey, Port Macquarie, Clarence Valley, Coffs Harbour	Multiple streams including C&I and C&D mixed waste	<20,000	MidCoast: Residual waste goes to the Taree WMF (Bucketts Way) and recycling goes to the Great Lakes MRF Port Macquarie: Residual waste goes to Cairncross Landfill, recycling to Cairncross MRF Clarence Valley: Residual waste goes to Armidale Landfill, recycling to Armidale MRF Kempsey: Residual waste goes to the Kempsey WMF, recycling to Cairncross MRF	Cardboard and Paper go to Visy, Orora or follow the market Glass is used in Tuncurry where it is manufactured into 6 different products including swimming pool filter. Organics are converted to compost in the Armidale/Grafton tunnel composting facility.
North Coast Recycling / Bens Skip Bins / Bobcat Ballina Pumping Service	Lismore, Ballina, Byron Lismore, Ballina, Byron	C&D mixed waste C&D source separated recycling (steel, timber, concrete) C&D mixed waste	<20,000	Steel is taken to Burleigh Tip General waste is taken to Ipswich Landfill, Qld (including plastics and cardboard where difficult to separate) Timber and concrete are transported to Qld All goes to Qld (three different locations, depending on composition)	Steel is exported. Timber is mulched and sold. Concrete is crushed and sold. Timber is used as a fuel at Rocky Point. No visibility as to where the rest of the material goes.
All Clean Skips	Nambucca	C&D mixed waste	<20,000	All disposal occurs at Nambucca Landfill	Not visible to contractor

		C&D source separated recycling (bricks, metal, masonry, gyprock, tin)			
				General waste: either Bellingen or Coffs Harbour Landfill (asbestos to Grafton)	
		C&D mixed waste		Concrete: Golden Sand	Garden organics: Mulched and sold in
John Lacey Earthmoving	Bellingen	C&D source separated recycling (concrete,	<20,000	Garden organics: Bellingen or Coffs Harbour facilities, occasionally MI Organics	landscaping shops Timber: If in reasonable condition, it is de-nailed
		garden organics , timber, metals, general waste)		Timber: Resurrection Recyclers (part of the John Lacey organisation)	
				Metal: Resurrection Recyclers or to Sell and Parker	
Kompsoy		C&D mixed waste		Mixed waste: Kempsey Landfill	Clean timber: Mulching, then either sold or given away
Skips and	Kempsey	C&D source separated recycling (concrete, timber, garden organics)	<20,000	Clean timber: Kempsey Landfill for mulching, then either sold or given away	Concrete/bricks: Crushed and sold or used on
Ourapo				Concrete/bricks: Cairncross facility	
					Metals are sent by OneSteel to Sydney.
		C&D mixed waste	<20,000	Kempsey landfill	Garden organics contractor shreds the mulch for sale or give away
Bins on Rims	Kempsey				Concrete contractor crushes the material for Council use (for road construction) or sold to the local market
					No visibility for the other materials.
Cleanaway*^	Kempsey, Port Macquarie	C&D mixed waste	<20,000	Not fully established	N/A

Golden Sands	Coffs Harbour	C&D source separated recycling (concrete, bricks)	3,000	Crush and screen then sell to local customers	Not visible to contractor
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* Handles both C&I and C&D waste

^ Only covers the Kempsey and Port Macquarie region, unable to contact a representative from other regions.

6.3 C&I waste contractors

Company	Region/s	Waste	Collection (tpa	a) Primary Destination(s)	End Markets
Tweed Skips*	Tweed (also operates in SEQ)	C&I mixed waste	<20,000	 Stott's Creek Landfill (Tweed Council) Reedy Creek Landfill (Burleigh, Gold Coast Council) 	No visibility
All Clear Demolitions*	Bellingen, Dorrigo, Grafton, Glen Innes, Port Macquarie etc.	C&I mixed waste C&I commingled recycling	<20,000	Nearest landfill (excluding Bellingen due to gate fee charge per sqm rather than weight)	No visibility
Total Waste Solutions	Coffs Harbour and Nambucca	C&I residual waste	<20,000	Biomass Solutions AWT, Coffs Harbour	No visibility
				MidCoast: Residual waste goes to the Taree WMF (Bucketts Way) and recycling goes to the Great Lakes MRF	
Mid Ker Por JR Richards* Ma Cla Val Har	MidCoast, Kempsey, Port	C&I residual waste C&I commingled recycling (paper and cardboard)	<20,000	Port Macquarie: All residual waste goes to Cairncross landfill and recyclables go to Cairncross MRF	No vicibility
	Clarence Valley, Coffs Harbour			Clarence Valley: All residual waste goes to the Armidale landfill and recyclables go to the Armidale MRF	The visibility
				Kempsey: Residual waste goes to the Kempsey WMF and recyclables go to the Cairncross MRF	
Kompooy Skipo		C&I residual waste		Mixed waste: Kempsey Landfill	Clean timber: Mulahad and either acid ar
and Scraps*	Kempsey	C&I commingled recycling	<20,000	Clean timber: Kempsey Landfill	given away

		C&I source separated recycling		Concrete/bricks: Cairncross facility	Concrete/bricks: Crushed and sold or used onsite
Ezy Waste	Kempsey	C&I residual waste C&I commingled recycling	<20,000	Mixed waste: Primarily Kempsey Landfill Cardboard: Consolidated for transport to Sydney	Cardboard: Orora, Cardboard King or Oatley Resources
Cleanaway*	Kempsey, Port Macquarie	C&I residual waste C&I commingled recycling C&I source separated recycling	<20,000	Mixed waste: Cairncross facility and Kempsey Landfill Cardboard / commingled: Cairncross MRF Garden organics: Cairncross facility and Port Macquarie-Hastings Council Organics: Cairncross Organics Resource Recovery Facility	Cardboard: Orora Commingled: Separated plastics are most likely exported; glass is either exported or taken to Victoria

* Handles both C&I and C&D waste

7 KEY FINDINGS

The key findings from the Stocktake report are captured below:

- Total Municipal Solid Waste (MSW): In 2018-19, the North Coast region generated nearly 340,000 tonnes of MSW, with a recovery rate of 57%, well above the state-wide MSW recovery performance of 42% in 2017-18. By 2039-40, generation is forecast to increase to almost 373,000 tonnes, a 10% increase over 20 years.
- **MSW residual waste:** Disposal to landfill in 2018-19 totalled over 145,000 tonnes, with 48% generated by NEWaste Councils in the north of the study area (70,000 tonnes) and 52% generated by MidWaste councils in the south (75,000 tonnes). By 2039-40, total residual waste generation is forecast to marginally increase, to nearly 157,000 tonnes.

This represents the baseline Council-managed feedstock for a potential energy-from-waste (EfW) facility. Thermal EfW facilities of the sort suitable to process mixed waste streams are generally optimised at more than 250,000 tonnes per annum, but could operate in a regional context at a scale of 60,000-120,000 tonnes per annum, particularly if co-located with industry with good offtake prices for both electricity and heat, and a recovery option for the bottom ash.

As expected, consultation with private contractors in the region did not yield quantitative information to support an estimate of C&I and C&D waste generation. Some 90,000 tonnes of residual waste disposal/processing contracts are due for renewal by 2025, excluding Councils with their own landfills (Section 3.5.3).

Remaining approved lifetime landfill capacity in the region totals 9.5 million tonnes, although there is another 4.3 million tonnes in expansion potential in existing and new sites.

- **Dry recycling:** In 2018-19, over 92,000 tonnes was recycled, primarily kerbside commingled (55,000 tonnes), drop-off materials (32,000 tonnes) and CDS containers (4,500 tonnes). Generation was evenly distributed between NEWaste and MidWaste regions, although the MidWaste mix was slightly more weighted to drop-off compared to kerbside collection. Residual waste bin audits in most Councils in recent years showed on average across the North Coast they contain 14% conventional recyclables (Section 3.4.2). Total MRF capacity in the region, either licenced approval or estimated throughput, is estimated at 112,500 tonnes per annum (Section 4.3.1), although this may be overstated as not all facilities will be able to operate at their approved capacity.
- **Organics:** Nearly 100,000 tonnes of organics was generated across the region in 2018-19, with 48% from NEWaste councils (47,000 tonnes) and 52% from MidWaste councils (51,000 tonnes). Of that, 78,000 tonnes was kerbside collected and 20,000 was drop-off.
- **Potential for a regional facility(s):** Seven councils identified potential sites for regional facilities. These were Ballina Waste Management Facility (Ballina), The Myocum Quarry (Byron), Grafton Regional Landfill (Clarence Valley), Three Chain Road Quarry (Lismore), Cairncross industrial waste precinct (Port Macquarie-Hastings), Bora Ridge Greenfield site and industrial land at Casino (Richmond Valley) and Taree Waste Management Centre (MidCoast). Five are located in the northern half of the region and two in the south, which could together provide coverage across the entire North Coast if multiple facilities are supported.

Other comments from Council surveys

- Allow each Council to specialise in one opportunity type

- Develop a regional resource recovery precinct, which could be co-located with the proposed AWT, to support recovery and reprocessing (if viable) or consolidation for transport to further reprocessing
- A strategically located, large-scale specialised facility has the potential to deliver optimal solutions and appropriate governance to minimise the exposure and risk to individual councils.
- Value-adding to recovered resources would reduce reliance on external markets and support local jobs and economy, although added volume may need to be sourced to supplement regional volumes.
- Need to support new local industries / manufacturing to provide a long-term viable market for the resources that are to be recovered and beneficiated.

8 NEXT STEPS

The Infrastructure and Data Stocktake and associated waste flow model has captured the current waste status and background across the NSW North Coast, along with a forecast of volumes under business as usual. It is intended to inform the subsequent identification and development of options to secure the region's waste services and improve diversion from landfill, with a key focus on MSW residual waste but also broader opportunities to establish local end markets and circular flows.

The next step is to validate or update this analysis of the current context, in particular sanity checking the waste data and findings of the consultation with Councils and private contractors. There are notable data gaps and uncertainties, including expanding the information on MidCoast Council, clarification of the 2018-19 recovery performance of the Coffs Harbour AWT facility and long-term potential for reconfiguration, and the continuing need for greater visibility around end markets.

A teleconference workshop with Councils will focus on two issues. One is to provide an opportunity to directly discuss the report and waste flow model, with a view to refining the analysis based on local knowledge. Workshop and written feedback will be integrated into a final Stocktake Report and waste flow model.

The second is using the report to inform a wide-ranging discussion of potential waste infrastructure opportunities, and in particular the options that will be assessed in phase 2. As per the RfQ, three scenarios are to be further defined and assessed, with sub-options under each: business as usual (BAU); options to manage residual waste on a regional basis, such as energy from waste; and development of a regional circular economy addressing a broader range of waste and recycling streams.

For each of the above scenarios and sub-options, the more detailed assessment will include:

- An assessment against best practice.
- An assessment of current and future carbon liabilities that will arise for each participating local government area, with a focus on landfill emissions, transport, renewable energy impacts and direct emissions from thermal treatment.
- A desktop infrastructure audit and analysis of supply chains required to support the regional solutions, highlighting where upgrades would be needed. This will include a high level (mostly qualitative) consideration of transport routes, modes and infrastructure; constraints in existing transfer infrastructure; and siting considerations for future infrastructure.
- A high level financial and economic benefit assessment for each option based on the data collated in phase 1 and estimated costs for new solutions.
- A sensitivity analysis for each option considering the potential impact of a reduction in waste volumes below future projections due to better than expected waste avoidance and recycling performance.

This Options Analysis report will be presented to Councils in a subsequent workshop to allow the analysis, assumptions and conclusions to be tested and refined.

The Stocktake and Options Analysis will be integrated into a single, coherent and usable project report.

APPENDIX A: REGIONAL POPULATION PROJECTION

Projected Population, NSW 2019

ASGS 2019 LGA	2016	2021	2026	2031	2036	2041
Ballina	42,993	44,237	45,364	46,248	46,835	47,092
Bellingen	12,951	13,069	13,138	13,139	13,071	12,938
Byron	33,399	34,869	36,050	36,946	37,572	37,955
Clarence Valley	51,622	52,320	53,215	52,638	51,681	50,377
Coffs Harbour	74,670	79,085	82,291	84,839	86,889	88,448
Kempsey	29,431	29,462	29,446	29,298	28,986	28,511
Kyogle	9,114	8,831	8,518	8,145	7,710	7,231
Lismore	44,122	45,954	45,724	45,149	44,213	42,944
MidCoast	91,801	94,941	97,621	99,162	99,962	100,087
Nambucca	19,580	19,873	20,182	20,442	20,622	20,705
Port Macquarie - Hastings	80,073	84,871	88,859	93,397	96,446	98,941
Richmond Valley	23,256	23,536	23,780	23,896	23,862	23,677
Tweed	93,742	99,552	103,414	106,728	109,444	111,531
TOTAL	606,754	630,600	647,602	660,027	667,293	670,437

APPENDIX B: MSW PROCESSING / DISPOSAL CONTRACT EXPIRY

The processing / disposal contracts or internal management for MSW are outlined below, including incumbent and contract expiry dates where relevant.

Council	Stream	Processing / Disposal Facility	Contract Expiry	Collection Service Provider	Notes
Ballina	Recycling	Polytrade Chinderah	2022	Council	-
	Organics	Phoenix Power Recyclers	-	Solo Resource Recovery (Richards Enterprises)	Interim arrangement due to fire at Lismore composting facility.
	Residual	Veolia Ti Tree	2020	Council	Currently extended on a month to month basis. Will be going to the market in early 2020 for a 2-3 year transport and disposal contract.
Bellingen				See Coffs Harbour	
– Byron	Recycling	Polytrade Chinderah	2022	Solo Resource Recovery (Richards Enterprises)	-
	Organics	Phoenix Power Recyclers	-	Solo Resource Recovery (Richards Enterprises)	Interim arrangement due to fire at Lismore composting facility. Long term options currently being investigated.
	Residual	Veolia Ti Tree	2020	Solo Resource Recovery (Richards Enterprises)	Currently into second extension period. New tender to be called prior to end of contract September 2020.
	Recycling	JR Richards	2022	JR Richards and Sons	Facility owned by Council, operated under contract
Clarence Valley	Organics	JR Richards	2022	JR Richards and Sons	Facility owned by Council, operated under contract
	Residual	Grafton Landfill (council)	N/A	Council	-
	Recycling	Coffs Harbour MRF	2027	Handybin Waste Services	Covers Coffs Harbour, Bellingen and Nambucca
Coffs	Organics	Biomass Solutions	2027	Handybin Waste Services	Covers Coffs Harbour, Bellingen and Nambucca
Harbour	Residual processing	AWT - Biomass Solutions	2027	Handybin Waste Services	Covers Coffs Harbour, Bellingen and Nambucca
	Residual disposal	England Road Landfill (council)	2022	Handybin Waste Services	Based on expected year of closure
Kempsey	Recycling	JR Richards	-	Cleanaway	Facility owned by PMHC, operated under contract

	Organics	Remondis Cairncross composting facility	-	Cleanaway	Facility owned by PMHC, operated under contract
	Residual	No data provided			
	Recycling	Solo Resource Recovery	2023	Solo Resource Recovery	-
Kyogle	Organics	MI Organics	On needs basis	N/A	No kerbside organics collection
	Residual disposal	Solo Resource Recovery	-	Council	-
Lismore				No data provided	
MidCoast				No data provided	
Nambucca				See Coffs Harbour	
	Recycling	JR Richards	2022	JR Richards	Already extended by 2 years
Port	Organics	Remondis Cairncross Composting Facility	2024	JR Richards	-
Macquarie- Hastings	Residual processing	AWT - Remondis	2024	JR Richards	-
	Residual disposal	Cairncross Landfill (Council)	-	-	-
	Recycling	Polytrade Chinderah	-	Council	Interim arrangement due to fire at Lismore.
Richmond Valley	Organics	ТВС	-	Council	Developing new facility and agreement due to fire at Lismore.
	Residual	Veolia Ti Tree	2020	Council	-
Tweed	Recycling	Solo Resource Recovery	2022	Solo Resource Recovery	-

Organics	Phoenix Power Recyclers	2020	Solo Resource Recovery	Soilco awarded contract for Design, Construct and Operate of FOGO processing facility to be located at Stotts Creek Resource Recovery Centre. Expected to be operational mid-2021.
Residual	Stotts Creek Resource Recovery Centre or Veolia Ti Tree	-	-	-