TO ZERO TOGETHER

TOWARDS ZERO

Byron Shire's Integrated Waste Management and Resource Recovery Strategy 2019-2029

BE A GOOD SORT
ORGANICS • RECYCLING • GARBAGE

Byron Shire Council


LIFEGUARD
KEEP ME SMOKE FREE BY USING THE BINS PROVIDED.

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MESSAGE FROM THE MAYOR

'Waste' is a term with a use-by date; increasingly, products and materials are being viewed as resources to be returned to productive uses rather than thrown away after a single use. This is a global shift, but it has to be driven by local action – by Byron Shire residents, community groups, businesses and the Council.

The Byron community is one of the most environmentally conscious in Australia, an aspiration that underpins the Council's vision to establish Byron Shire as landfill free, and carbon neutral by 2025 as we face a growing climate emergency.

We have already achieved a great deal in reducing the amount of waste we send to landfill. By collecting our household food organics and garden organics (FOGO) in a single bin and producing high quality compost, we avoid Council's single largest source of greenhouse gas – methane from landfill.

There is more to do to achieve our ambitious vision and it is with great pleasure that I introduce the Byron Shire's Integrated Waste Management and Resource Recovery Strategy 2019-2029, titled Towards Zero. It lays out how we will collectively move towards sending zero waste to landfill through a suite of local and, potentially, regional initiatives over the next decade and beyond.

The strategy requires all of us to participate as we join the transition to a circular economy model, where product design, use and end-of-life management are all optimised for reuse and recovery.

For Council, that means ensuring the stewardship of our domestic waste streams and waste facilities remains best practice, but also exploring further options for household and commercial waste and working with the whole community to develop local options to avoid, reuse and recover other wastes.

For residents, it means being a good sort in the household, but also being aware of your broader waste footprint and stepping into the reduction opportunities outlined in this Strategy and emerging through our very active community.

For business, it means tapping into Council and other programs to understand and address the sources of your waste, including schemes to engage the high number of visitors we attract each year.

I am delighted to launch the Towards Zero strategy and encourage you all to join the journey to create a carbon neutral and landfill free Byron Shire.

Simon Richardson,
Byron Shire Council Mayor 2019

INTRODUCTION

Waste management in developed economies primarily occurs behind the scenes. Kerbside collections are seamless and efficient; disposal and recycling operations are located away from communities to minimise intrusion; and the end markets for our recycling streams are over the horizon. This historic lack of public visibility that has contributed to the rising challenge of waste, but that challenge is now catching the public eye.

Waste management in Australia is in transition. The Byron Shire community, like Australians everywhere, are ever-more aware of the impacts of waste and pollution on the environment, climate and health. They are tuning in to the downsides of single use products and packaging, and recognising the need to maximise the value of recovered materials. They are also recognising the importance of developing resilience and sustainability at the local scale, rather than over-relying on global supply chains to provide products and remove recyclables.

The Byron Integrated Waste Management and Resource Recovery Strategy 2019-2029 asks the key questions: where are we now, where do we want to be, and how do we get there? The answers are grounded in community priorities, council realities, regional discussions and state government waste policy, overlaid with the current and future waste context and the evolution of best practice in the waste industry.

The strategy builds on a strong foundation but also represents a step change in the way we manage waste as a community. It is titled Towards Zero because it delivers Byron Shire's transition to a Shire that is carbon neutral by 2025 and landfill-free. We aim to send zero waste to landfill by pursuing higher order outcomes and transitioning our infrastructure investment from landfill to innovative solutions that recover value from the waste we can't avoid.

This vision is given traction through four strategic objectives, which are in turn underpinned by a hierarchy of targets, tasks and timelines that are the engine room of the strategy. The objectives are:

1. **Empower the community to increase avoidance, reuse and recycling activities**
2. **Maintain and enhance solutions to recover/treat/dispose of residual waste**
3. **Work with the business and tourism sector to reduce waste to landfill**
4. **Support and lobby for NSW and Federal Government action to help reduce overall waste generation and disposal. The targets and integrated action plan supporting each objective is presented in pages 18-24.**

We hope the Byron Integrated Waste Management and Resource Recovery Strategy resonates with your needs and aspirations. Feel free to let us know: council@byron.nsw.gov.au

STRATEGIC VISION:

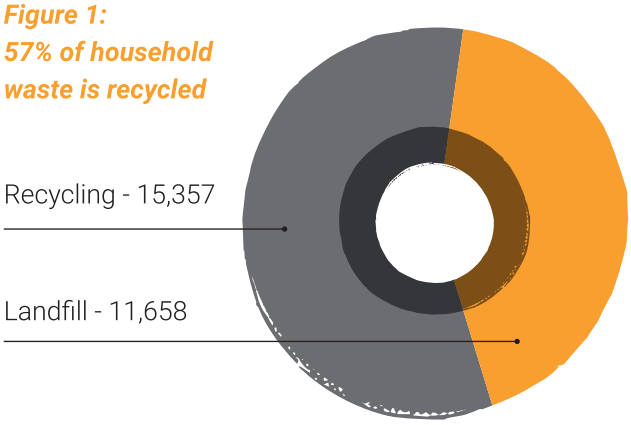
To support a landfill-free, zero net emissions shire through best practice in waste avoidance, recovery and treatment

BY THE NUMBERS

Located on the far north coast of NSW, the Byron Shire is characterised by a mix of residential areas spread across a number of towns and villages, tourist accommodation, agricultural and rural-residential areas, national parks, commercial and industrial land uses, and a steadily growing population of more than 33,000 people.

The 567 km2 shire is one of the state's premier tourist destinations with approximately 2 million visitors each year, driving up the volume and spikes of waste generation. This presents unique challenges in managing and reducing waste from the tourism industry and short-term rental, two key pillars in the local economy.

Figure 1:
57% of household waste is recycled



2012-2015 WASTE MANAGEMENT STRATEGY

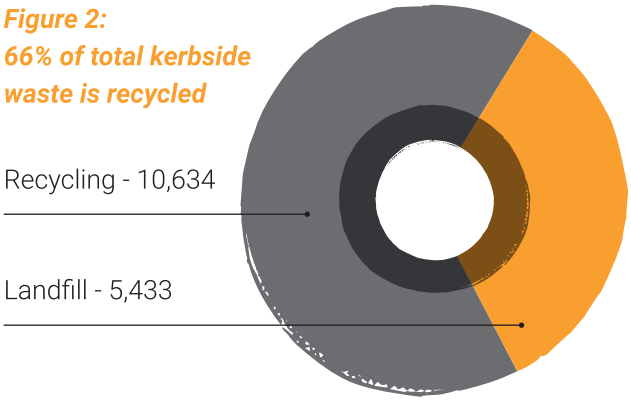
Substantial progress has been made in implementing the previous 2012-2015 Waste Management Strategy.

The headline result is that recycling of municipal solid waste (MSW) jumped from 45% in 2014/15 to 57% in 2017/18 ***(Figure 1)***. This includes household kerbside bins as well as the bulky waste collected at the kerb and dropped off to the Byron Resource Recovery Centre (BRRC).

The key change since the last strategy is the introduction of the household food organics and garden organics (FOGO) service in 2015. With the support of the community, this reform shifted a considerable volume of food waste out of the red bin into the weekly FOGO pick-up, for processing into high grade compost, and complemented the fortnightly recycling and waste services (as modified).

As part of the Council waste services, collection of waste from local businesses is also supported. Overall, recycling from our kerbside waste collections rose to 66%, a very positive result ***(Figure 2)***.

Figure 2:
66% of total kerbside waste is recycled



SATISFACTION: 2018 SURVEY

The community views waste services as second only in importance to local roads as an essential service provided by Council, and sees the Byron Resource Recovery Centre (BRRC) as a key strategic asset. The 2018 community survey indicated broad satisfaction with waste services overall, but noted there is some work to do on the BRRC.

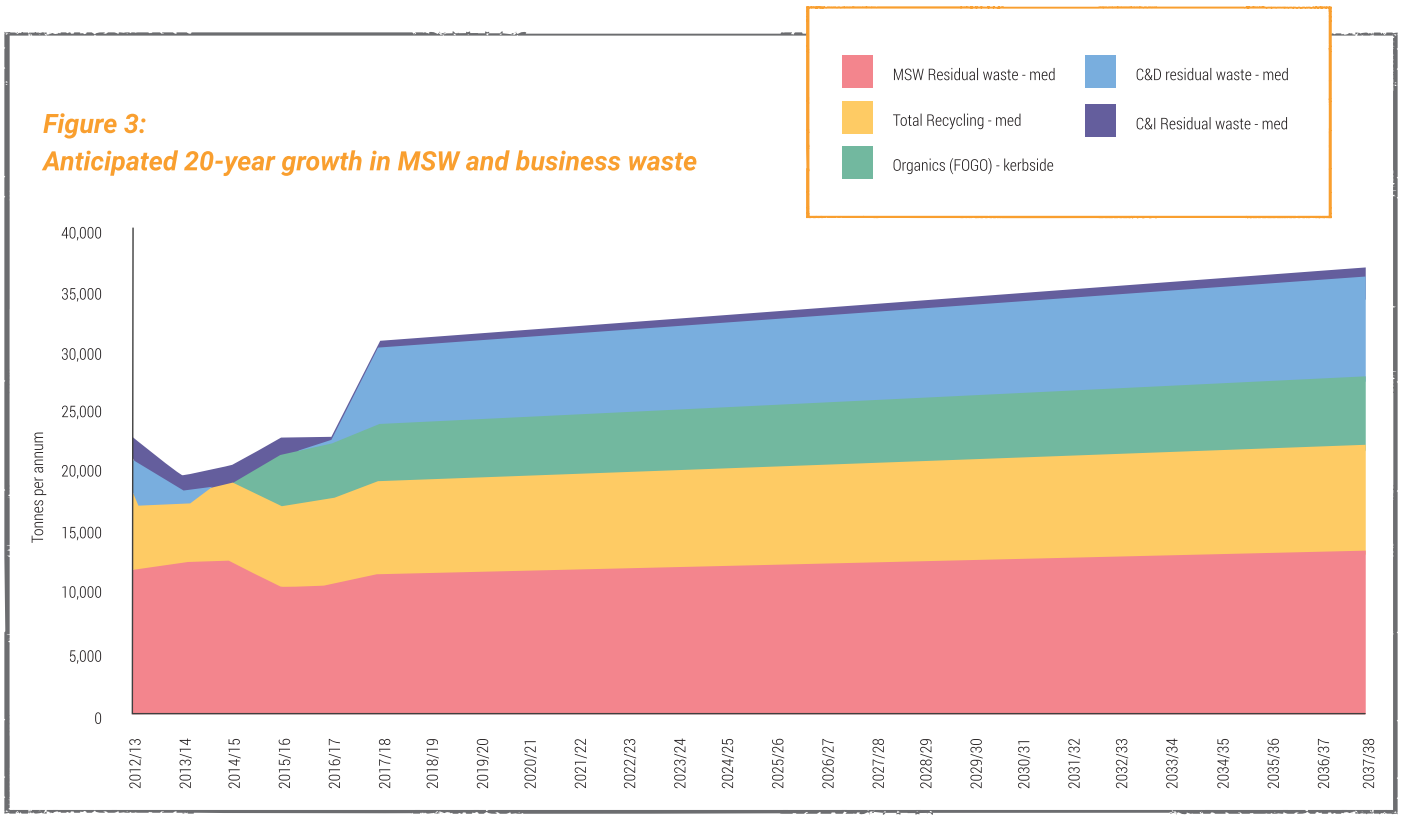
- ✔ Waste collection – High satisfaction
- ✔ Recycling – Moderately high satisfaction
- ✔ Resource Recovery Centre – Moderate satisfaction

The BRRC has been a key focus for development in recent years. The masterplan has been developed for the centre on the Myocum landfill site, which features a resource recovery centre with public drop-off areas, tip shop, composting facility, a Community Recycling Centre for household problem waste and transfer station to aggregate waste into bulk loads for transport to final facilities.

WASTE OUTLOOK

While waste to landfill has reduced the size of the task to manage Byron's waste has continued to expand, spurred in particular by growth in population and tourism. Unless changes are made waste generation is expected to grow by 20% to 35,000 tonnes by 2035/36, with a similar growth rate in the number of tonnes sent to landfill. This has been captured in ***Figure 3*** and explained further in Appendix A.

Figure 3:
Anticipated 20-year growth in MSW and business waste



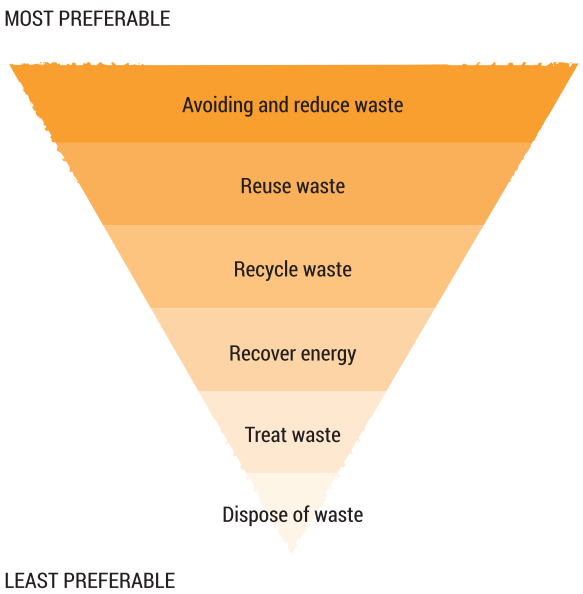
GUIDING PRINCIPLES

Planning for waste management does not occur in a vacuum. It is guided by both well established principles and emerging thinking as the challenges evolve. The waste hierarchy and the circular economy model are compatible frameworks that underpin the Towards Zero Strategy.

WASTE HIERARCHY

The waste hierarchy is the core conceptual framework behind waste policy at all levels ***(Figure 4)***. It establishes the priorities in managing waste, based on environmental impact and sustainability.

Figure 4: The waste hierarchy



- Avoiding waste, such as using reducing consumption or sharing community equipment, reduces the impact at every point in the supply chain.
- Reuse, such as reusable cups and bags and buying second hand, extends the life of a product.
- Recycling (and composting) retains the basic integrity of the recycled material to create a new product.
- Products and materials with no higher order uses can be converted to energy, offsetting greenhouse emissions from conventional electricity generation.
- Landfill disposal is an essential backstop, but should be the option of last resort.

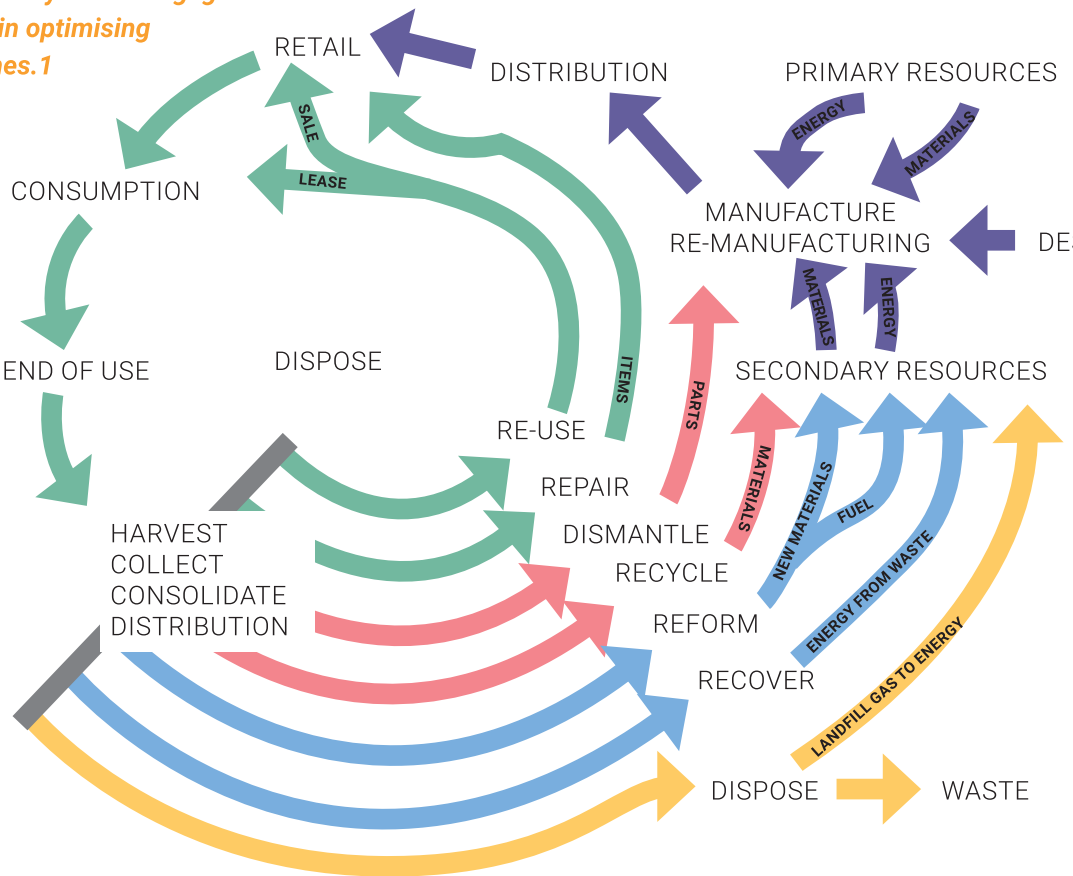
CIRCULAR ECONOMY

The circular economy model illustrates the actions and relationships that deliver the outcomes under the waste hierarchy.

The model ***(Figure 5)*** shows the supply chain as a network of pathways designed to circulate materials within their highest order uses, minimising waste and environmental impact.

- Manufacturer's design for disassembly and integrate virgin and secondary materials
- Retailers are open to sell second hand and remodelled items
- Consumers, including businesses and Council, buy recycled and select the optimal recovery pathway for end-of-life items
- Council optimises resource and energy recovery at its waste facilities.

Figure 5:
The circular economy model engaged all stakeholders in optimising resource outcomes.1



How traditional waste collections contractors can play a pivotal role in a new circular economy.

[1] Adapted by Waste Management Review (Feb 2019), original source unknown

THE POLICY CONTEXT

The *NSW Waste Avoidance and Resource Recovery Act* requires local government to adopt a Waste Strategy in order to achieve the objectives of the Act.

The policy framework sets the overall direction for waste management and cascades down through national, state and regional requirements, which collectively inform the scope for a waste strategy for Byron. The key settings are illustrated below.

National	National Waste Policy 2018	Primarily developed in response to challenging import restrictions introduced on mixed recyclables by China and others, it provides a high level direction to encourage the circular economy.
	2025 National Packaging Targets	Also developed in response to Chinese import restrictions, key targets are: • 100% of all Australia's packaging will be reusable, recyclable or compostable by 2025 or earlier • 70% of Australia's plastic packaging will be recycled or composted by 2025 • 30% average recycled content will be included across all packaging by 2025 • Phase out single-use plastic packaging through design, innovation or introduction of alternatives.
	Protection of the Environment Operations (POEO) Act 1997 – and Waste Regulation 2015	The state's principal environmental protection legislation, the POEO Act defines 'waste' for regulatory purposes, lays out management and licensing requirements for waste operations, and establishes offences. The associated Regulation includes Resource Recovery Exemptions and Orders to support the reuse of permitted waste for alternative purposes.
New South Wales	Waste Avoidance and Resource Recovery Strategy 2014-21	Establishes state-wide targets for 2021/22, including: • Divert 75% of total waste from landfill • Increase municipal waste recycling to 70% • Increase business waste to 70% • Increase building waste to 80%.
	Circular Economy Policy Statement – 'Too Good to Waste' discussion paper	The first step in establishing a Circular Economy Policy to decouple economic growth from resource consumption and create local opportunities to deliver higher order outcomes.
	Container Deposit Scheme	Introduced in 2018, the Container Deposit Scheme has established sites to take back eligible containers for a redeemable deposit, in order to reduce littering.
Regional	Northern Rivers Joint Organisation	Sustainable waste management is a priority, with investigation of a regional alternative waste treatment (AWT) facility identified as key action.
	North East Waste (NEWaste) Regional Waste Management Strategy 2017-2021	A high level strategy providing guidance on best practice for councils in the Northern Rivers region, including opportunities for collaboration.

THE STRATEGY SUITE

The NSW Government's Integrated Planning and Reporting framework ***(Figure 6)*** establishes the internal governance architecture that guides the strategic and operational direction of the Shire.

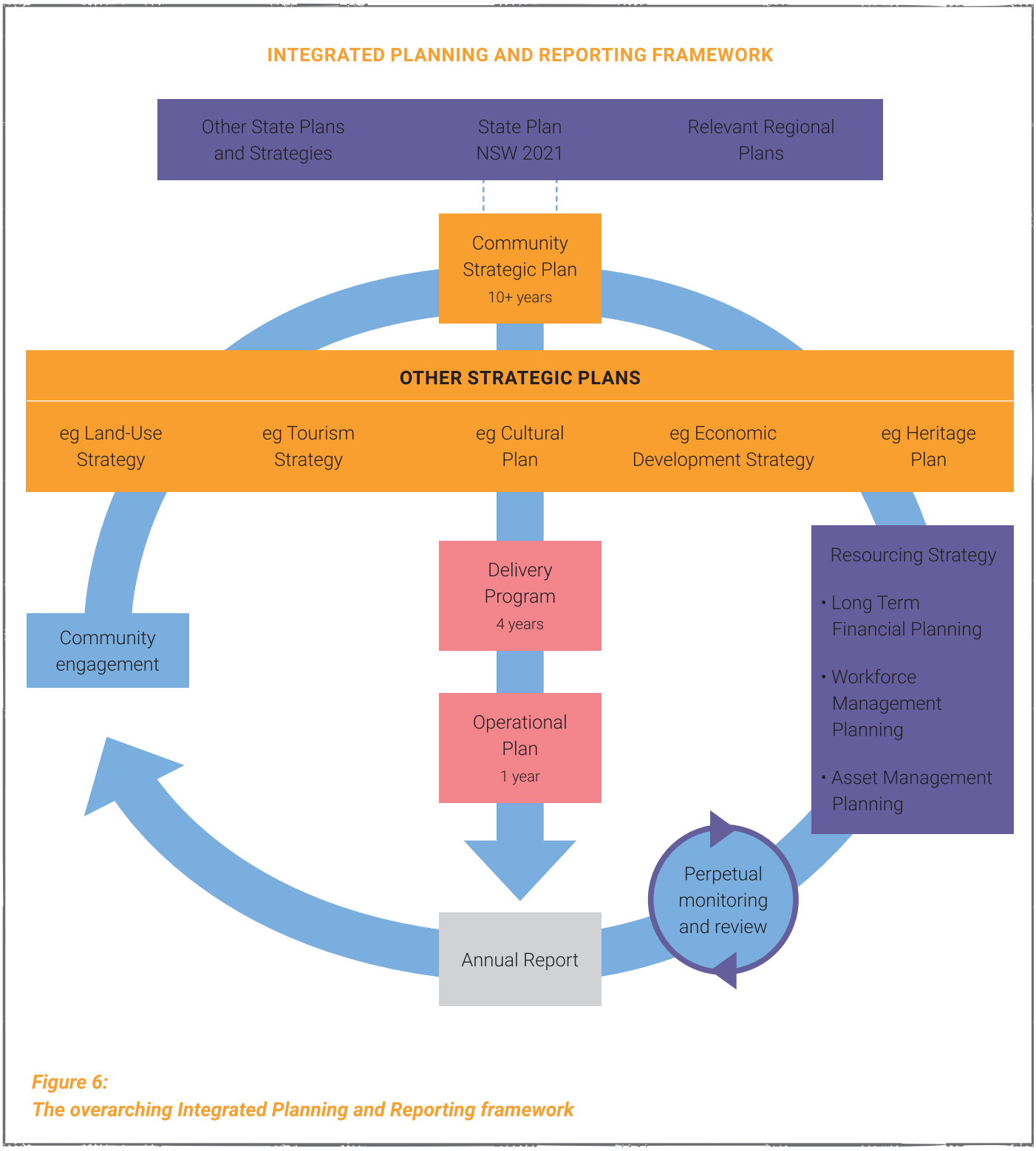


Figure 6:
The overarching Integrated Planning and Reporting framework

Towards Zero - Byron Shire's Integrated Waste Management and Resource Recovery Strategy sits within the suite of Strategic Plans. ***Figure 7*** identifies the specific strategies and plans that touch on waste, informing its priorities and shaping internal responsibilities.

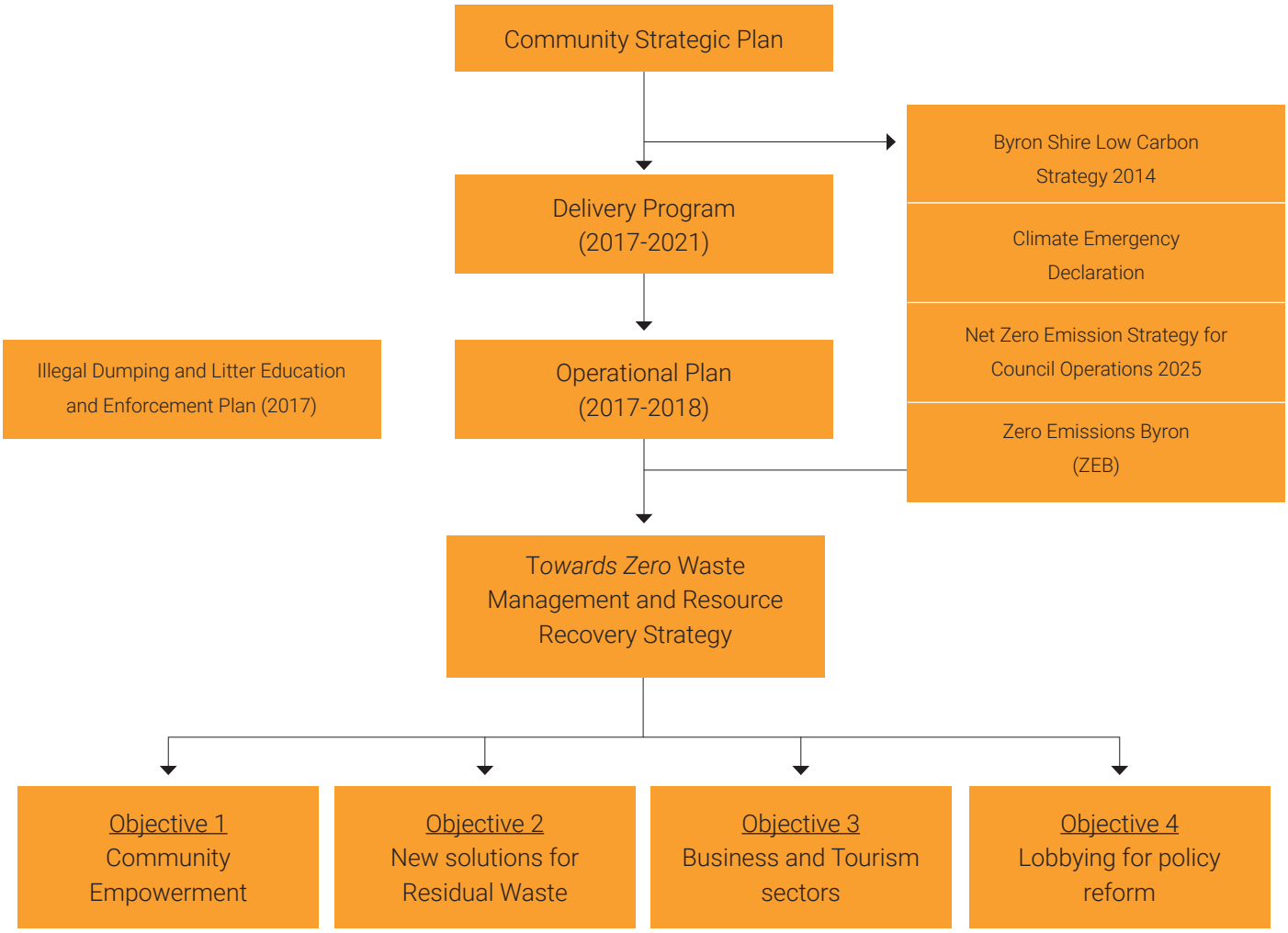


Figure 7:
The internal policy interface for the Waste Strategy.

KEY GOALS IN THE COMMUNITY STRATEGIC PLAN 2027

- Transition to a low carbon community, including waste minimisation and low consumption lifestyles
- Champion a 'no pollution' culture
- Improve the sustainability of the tourism sector
- Encourage local environmental and sustainable initiatives
- Long term planning for waste infrastructure and services
- Waste services to comply with environmental regulations and policy goals
- Participate in regional waste initiatives

THE WASTE CHALLENGE

The primary issues facing the Byron Shire and a snapshot of the key opportunities are captured below, framing the development of the Strategy's objectives and actions.

Challenge	Opportunity
Waste reduction	
One dimension of striving for zero waste to landfill is reducing the volume of waste generated, which is currently rising with population and economic growth.	Work with all groups in the community to develop smart, targeted programs to avoid and reduce waste, delivering environment and climate benefits.
Eliminating landfill	
The other key aspect of eliminating landfill is developing an alternative for the residual waste streams that cannot be avoided.	Alternative waste treatment (AWT) technologies will recover value from residual waste, but costs and operations are optimised when processing a significant volume of waste. Exploring opportunities for regional co-operation.
Markets for recyclables	
Recycling relies on end markets to close the loop and defray the costs, but local markets are limited and broader markets vulnerable to global changes.	Considering new reprocessing infrastructure in tandem with supporting applications for recovered materials within the Shire, including through Council procurement, will help secure recycling, create jobs and improve local resilience.
Tourism-related waste	
Tourim is the Shire's largest industry, but also a key waste and recycling challenge in terms of the behavioural tendencies of holiday makers, total waste volumes and sharp periodic peaks.	Targeted campaigns engaging tourists and the tourism sector may flatten the peaks and improve recycling behaviours.
Optimising infrastructure	
The Council owns one waste facility, the BRRC at Myocum, and must optimise it to provide secure and affordable waste and recycling services for the long-term.	The BRRC masterplan provides a clear site development strategy, while satellite drop-off facilities for key recyclable materials provide an option to optimise the waste network and public place bin infrastructure is being optimised to address litter.
Innovative services	
The introduction of the FOGO service has been a success, but other waste streams could also be targeted for recovery.	Improved recovery of kerbside and drop-off bulky waste and services to collect targeted waste streams such textiles could increase diversion from landfill.
Council-generated waste	
Council works and operations are significant generators of diverse waste streams.	A review of internal practices, additional employee engagement and identification of reuse opportunities will divert more waste from landfill to productive uses.
Land use planning	
New development must be waste-smart so that growth does not undermine the vision of a landfill-free, carbon neutral Shire.	Revised development controls could improve the requirements for waste and recycling in new buildings, including multi-use and medium to high density developments

WASTE INFRASTRUCTURE OPTIONS

The next step change in waste performance is likely to come from diverting more residual waste from landfill, and that is likely to mean some form of advanced processing or alternate waste treatment (AWT) technology solution.

The scale of investment required for an AWT requires more tonnes of waste than Byron generates each year, so the likely pathway is collaboration with neighbouring councils to develop a regional facility. No single council in the Northern Rivers generates adequate tonnes to proceed alone, so a joint approach makes sense for all.

Analysis of potential Northern Rivers regional feedstocks as part of this Strategy estimated there is around 70,000 tonnes per annum of Municipal Solid Waste (MSW), drop-off and Commercial and Industrial (C&I) waste, which are the primary streams suitable for an AWT. If the technology selected could only process kerbside MSW, feedstocks are reduced to 40,000 tonnes per annum. If waste is sourced beyond the region, the scale could be significantly greater.

The main technology types and their key characteristics are outlined in ***Table 1***.

Table 1: The principal AWT technology types

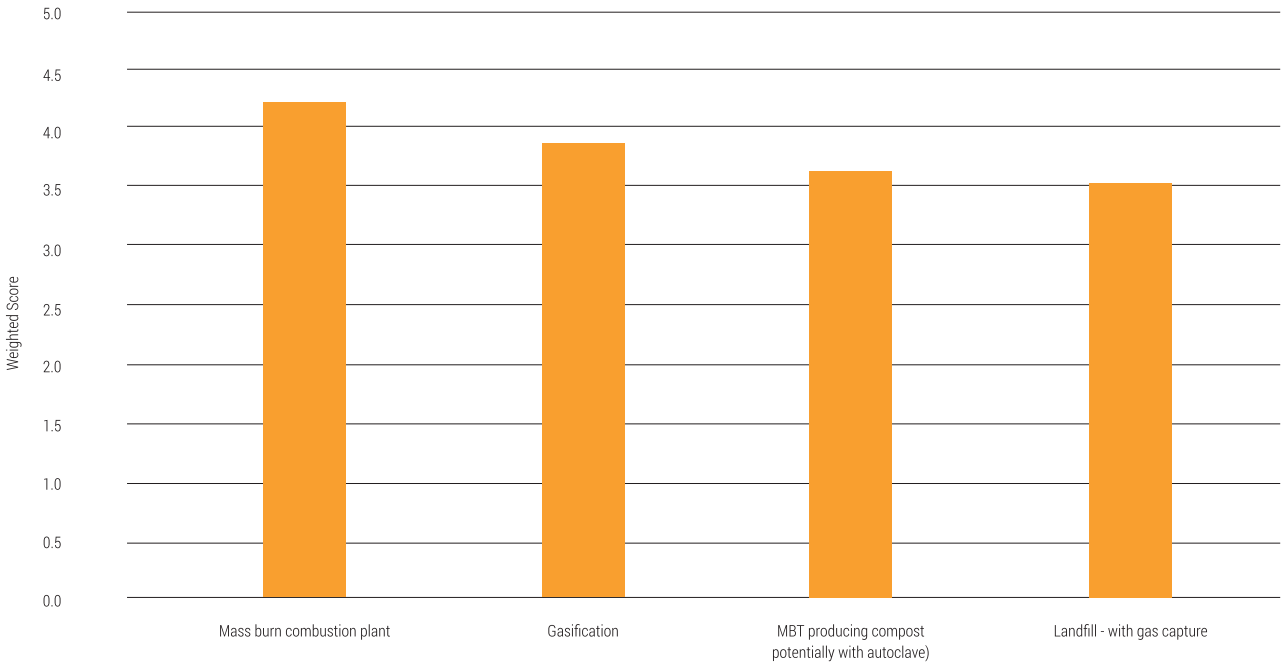
Technology Group	Process Description	Technology Group	Outputs
Combustion	Combustion completely burns the carbon-based components of the waste in a purpose-built furnace. The technology has been widely deployed across the globe and has the strongest technical and commercial track record of all AWT technologies.	• Landfill diversion of 75-80% • Untested in Australian • Requires large scale	• Electricity • Waste fly ash and bottom ash
Gasification	Gasification occurs in a limited oxygen environment so that waste is partially oxidised into a combustible synthetic gas (syngas). For close-coupled gasification, the most common approach, the syngas is immediately burned and the heat and energy recovered in a similar manner to combustion facilities.	• Landfill diversion of 75-80% • Untested in Australian • Requires medium to large scale	• Electricity • Waste bottom ash
Mechanical-Biological Treatment	MBT combines mechanical separation of dry and organic fractions, with further sorting of dry recyclables and biological processing of the organics into low-grade soil improver or a solid fuel. Mature technology.	• Landfill diversion of 40-50% • Successfully implemented within a similar regional context in the Coffs Harbour area	• Low grade soil improver / compost • Refuse derived fuel • Dry recyclable materials

To assess the suitability of various AWT technologies in the regional context, six technologies were evaluated against key performance criteria based on the context and the Council's objectives and constraints. The nine criteria were:

1. Suitability to process residual waste of the types generated in the region
2. Financial viability relative to benchmark costs, including a positive cost-benefit outcome relative to landfill as well as future cost security and stability
3. Capable of being implemented at the required scale as noted above
4. Landfill diversion performance
5. Local markets for key products / outputs
6. Ability to meet planning requirements and regulations
7. Likely community acceptance
8. Commercial track record, maturity and risk profile
9. Carbon performance.

As a benchmark, the three main technologies were compared with business as usual, which is landfill with gas capture. The assessment ***(Table 2)*** shows that all the AWT technologies are preferable to landfill, with combustion rating the highest.

Table 2: The results of a multi-criteria analysis of AWT technologies and business as usual (landfill)



Council will undertake further assessment and regional discussions to progress the assessment of AWT, including deepening the analysis of technologies (including additional emerging technologies), key risks, the business case, suitable sites and community sentiment. Procurement processes for medium- and large-scale waste processing facilities are carefully structured and take at least 2-3 years before construction even begins. Council is committed to investigating the opportunity.

THE STRATEGIC FRAMEWORK

VISION STATEMENT

To support a landfill free, zero net emissions shire through best practice in waste avoidance, recovery and management

OBJECTIVE A

Empower the community to increase avoidance, reuse and recycling

GOALS

- Maintain total waste disposal to landfill at 2010-11 levels in the medium term
- Reduce the percentage of recyclables in household waste bins, from 36% in 2016-17
- Reduce the disposal of bulky waste to landfill
- Support the 'Illegal Dumping and Litter Education and Enforcement Plan 2018' goal to meet the state target to reduce illegal dumping

KEY ACTIONS

1. Enhance contamination auditing, reporting and enforcement activity
2. Update household waste behaviour messaging
3. Continue FOGO communications campaign and build in food waste avoidance messaging
4. Investigate developing a Waste Education Centre
5. Develop a digital engagement strategy and alternative communication channels
6. Implement the Illegal Dumping and Litter Education and Enforcement Plan 2019

OBJECTIVE B

Optimise and enhance solutions to recover/treat/dispose of residual waste

GOALS

- By 2020, determine the feasibility of pursuing a regional AWT solution
- By 2025, exceed the state target for diversion of municipal waste from landfill
- Optimise and maintain waste and recycling infrastructure to meet current and future levels of service and cost, including customer satisfaction
- Comply with all statutory requirements for waste and resource recovery infrastructure and operations, including all safety, environmental, planning and local government legislation

KEY ACTIONS

1. Investigate a regional alternative waste treatment (AWT) facility
   - Establish Regional Working Group of councils
   - Detailed options analysis and business case
2. Investigate additional waste service options
3. Review demand for and configuration of bulky waste services
4. Improve management of Council waste
5. Explore collaboration opportunities with key stakeholders
6. Maintain existing asset and operational plans

OBJECTIVE C

Work with the business and tourism sector to reduce waste to landfill

GOALS

- By 2025, exceed the state target to reduce the number of litter items
- 80% of tourism / hospitality companies participating in a commercial waste reduction scheme by 2025
- Facilitate the expansion of commercial FOGO collection to suitable businesses

KEY ACTIONS

1. Support enhanced commercial waste collection services, with a focus on commercial food waste
2. Engage local business community, including a Waste Free Byron campaign
3. Develop a waste wise campaign targeting the tourism industry
4. Develop and implement measures to foster a local circular economy
5. Support the incoming Sustainable Eve nt Policy
6. Review and revise development control policies to align with strategic waste objectives

OBJECTIVE D

Support and lobby other tiers of government to facilitate a step change change in waste outcomes

GOALS

- Adopt and advocate aspirational principles, targets and solutions on waste at the NSW Government and regional level
- Actively participate in all relevant NJRO and NEWaste actions and consultations
- Lobby for clearly defined policy, sufficient funding and other support to develop an Australian-based recyclables processing industry

KEY ACTIONS

1. Engage the NSW and Federal governments to advocate broader policy review and reform, aligned with BSC strategic objectives

OBJECTIVE 1 – COMMUNITY EMPOWERMENT

Byron Shire is a hub of grassroots sustainability activity and the community is a key resource in the war on waste.

The most powerful ways to reduce our waste footprint are at the top of the waste hierarchy, to avoid waste and reuse materials in ways that make the most of their embodied value and energy. They are also the most challenging to motivate as they require a high level of engagement and participation.

Analysis of our performance (Appendix A) indicates there is also room to improve around household waste. Municipal solid waste generation per person has increased 16% over the last five years to 819 kg per year, including kerbside bins and bulky waste collections and drop-off.

Audits of red landfill bins also show that, on average, around 50% of the contents could be recycled, and up to 65% if a regional AWT facility is developed.

Empowering the community to avoid waste and improve bin performance promises major gains in environmental, economic and social terms. The actions under this objective aim to help the community activate its interest, knowledge and skills around sustainability to change consumption and waste behaviours.

KEY GOALS

- ✔ Maintain total waste disposal to landfill at 2010-11 levels in the medium term
- ✔ Reduce the percentage of recyclables in the household waste bin, from 36% in 2016-17
- ✔ Reduce the disposal of bulky waste to landfill
- ✔ Support the 'Illegal Dumping and Litter Education and Enforcement Plan 2018' goal to meet the statewide target to reduce illegal dumping

EMPOWER THE COMMUNITY TO INCREASE AVOIDANCE, REUSE AND RECYCLING		Timeframe (Years)		
		Short (1-3)	Medium (4-7)	Long (8-10)
1. Reduce contamination in kerbside residual waste and recycling				
1.1	Conduct ongoing kerbside bin campaign, audit and inspection programs, including: • Visual contamination audits • Enhance use of In-Vehicle Monitoring System by collection contractor • Composition audits every 3 years, or as required • Other campaign/program in response to evolving issues.			
1.2	Periodic review of communication collateral and branding around general household resource recovery behavior in response to evolving industry and community issues/ changes.			
2. Continue and expand FOGO communications campaign				
2.1	Ongoing communication / education around the weekly food organics and garden organics (FOGO) collection service to maximise capture and minimise contamination.			
2.2	Develop, adopt and communicate food waste avoidance programs that align with, and build on, existing FOGO behavioral program (e.g. 'Love Food Hate Waste' program by EPA NSW).			
3. Overarching community empowerment / education				
3.1	Develop a specific campaign every 3 months targeting a key issue, demographic or waste stream / type. Develop a digital strategy to use online/social media and expand communications channels to engage the community around broader waste and resource recovery programs and initiatives:			
3.2	• On-going innovation, upgrade and utilisation of the Council website • Promote, expand and utilise Recycle Coach mobile and on-line app • Develop a Council resource recovery social media account(s).			
3.3	On-going development and implementation of contemporary alternative waste behaviour engagement programs			
3.4	Develop and support community-based sustainability and circular economy initiatives, such as at expanded BRRC (Objective 2), share economy opportunities (e.g. a 'tool library' to borrow tools rather than buy them) and promotion of sustainable product choices through clearer messaging and targeted campaigns.			
3.5	Investigate development of a Waste Education Centre, potentially at the BRRC or Brunswick Valley Sustainability Centre, and consider synergies with education on solar energy, water/sewer and other topics.			
3.6	Develop innovative waste and sustainability education workshops aligned to Byron community needs: • Digital and face-to-face at the potential Waste Education Centre or other relevant facilities (e.g. Bioenergy Facility)			
3.7	Develop a targeted education campaign to rural households promoting home composting.			
3.8	Continue to advocate and expand local school campaigns, with programs covering preschool, primary school program and a more structured high school program.			
3.9	Develop and expand existing programs and information targeting the rental market.			
3.10	Promote problem waste drop-off to the CRC and the network of Specialty Recycling Stations (SRS)			
3.11	Continue community surveys to determine community awareness, behavioral patterns and satisfaction with Council's services.			
3.12	Implement the Illegal Dumping and Litter Education and Enforcement Plan 2019			

OBJECTIVE 2 – SOLUTIONS FOR RESIDUAL WASTE

Major reforms have already been implemented to reduce waste to landfill, such as the rollout of the FOGO kerbside service and masterplanning to optimise the BRRC. Recovering 57% of municipal solid waste is a good start, but there is more to become carbon neutral and landfill-free.

We intend to explore additional assets and services to continue improving the recovery rate of waste streams, diverting it from landfill into valuable uses. An AWT facility for residual waste is a key focus, as are options to recover bulky waste, which has been growing strongly in recent years (Appendix A).

In developing alternatives, we cannot lose sight of the fundamentals, which are to maintain our existing waste infrastructure in line with their strategic importance and to operate them in compliance with regulation.

Objective 2 consolidates the next steps in enhancing Byron Shire waste infrastructure and services.

KEY GOALS

- ✔ By 2020, determine the feasibility of pursuing a regional AWT solution
- ✔ By 2025, exceed the state target for diversion of municipal waste from landfill
- ✔ Optimise and maintain waste and recycling infrastructure to meet current and future levels of service and cost, including customer satisfaction levels
- ✔ Comply with all statutory requirements for waste and resource recovery infrastructure and operations, including WHS, Environmental, Planning and local government legislation

OPTIMISE AND ENHANCE SOLUTIONS FOR RESOURCE RECOVERY AND TO TREAT / DISPOSE OF RESIDUAL WASTE		Timeframe (Years)		
		Short (1-3)	Medium (4-7)	Long (8-10)
1. Reduce contamination in kerbside residual waste and recycling				
1.1	Conduct ongoing kerbside bin campaign, audit and inspection programs, including: • Visual contamination audits • Enhance use of In-Vehicle Monitoring System by collection contractor • Composition audits every 3 years, or as required • Other campaign/program in response to evolving issues.			
1.2	Periodic review of communication collateral and branding around general household resource recovery behavior in response to evolving industry and community issues/ changes.			
1.3	Consider synergies with the Byron BioEnergy project.			
2. Investigate additional waste service options				
2.1	Assess additional recovery options for self-hauled garden organics, including continuing to compost at the BRRC and synergies with the Byron BioEnergy project.			
2.2	Investigate and implement new waste services at the BRRC, including: • Bulky waste to increase recovery and reduce illegal dumping at the kerbside • Expansion of the tip-shop operation • Alternatives such as recycled/reuse markets, repair facilities, men's shed and waste-to-art projects.			
2.3	Consider new collection/recovery services (e.g. drop off clothing/textiles) and larger recycling bins (360L compared to 240L).			
2.4	Consider opportunities to collect and process waste streams from the agricultural sector at existing or potential waste facilities (e.g. dairy farming, sugar cane and fruit, nut and coffee growing).			
2.5	Investigate potential to install smaller satellite drop-off facilities for recyclable materials.			
3. Improve management of Council-generated waste				
3.1	Review internal waste management systems and performance and contract specifications for all relevant aspects of council operations.			
3.2	Develop a council employee education campaign which builds on the outcomes of the performance review above.			
4. Explore opportunities for collaboration				
4.1	Explore opportunities to build on the previous collaboration with Lismore University (around uses for FOGO-derived compost) to facilitate trials and research			
4.2	Explore the opportunity to engage social enterprise programs to assist in resource recovery actions at BRRC (e.g. labour for resource recovery operations).			
4.3	Engage local community groups and not-for-profits to jointly implement programs and campaigns.			
4.4	Continue membership of the North East Waste regional management group and active participation in programs and initiatives.			

5. Maintain existing waste assets and compliance				
5.1	Ongoing review of the public place bin network to maintain an effective and adequate public place bin network and service, including: • Number and location of waste and recycling bins • Contamination audits • Educational signage • Investigation and trial compactor bin in high traffic areas to reduce service frequency and improve amenity • Consider options to expand recycling further and for public place organics.			
5.2	Maintain existing waste and resource recovery assets to ensure there is no degradation in capacity and efficiency, particularly for the BRRC and the public place bin network.			
5.3	Comply with all statutory requirements around waste infrastructure and operations, including EPA licenses, EPA regulations and DA consents.			
5.4	Develop and implement a detailed Asbestos Management Plan to inform waste management operations.			
5.5	Investigate and progress the conversion of Myocum quarry (at closure) into a resource recovery facility for composting and C&D waste recovery.			
5.6	Implement a closure plan for the Myocum landfill.			
6. Planning for best practice kerbside collection				
6.1	Develop a plan and the information base required to procure new kerbside collection contracts (residual waste, FOGO, recycling).			

OBJECTIVE 3 – BUSINESS & TOURISM

Tourism is the main driver of economic activity in the Byron Shire, which is the fourth most visited NSW destination among international visitors, and the 11th most visited place overall in NSW. It is also a key focus of community concern in terms of managing environmental impacts, which include waste generation and littering our natural environment.

While Council offers commercial and industrial (C&I) waste collection, it is mostly pick-up by private waste collectors. However, much of the C&I waste stream is aggregated at BRRC before transport to final facilities, and analysis of this flow suggests there is more value to be recovered.

Accommodation and food service account for 49% of the Shire's business waste (Appendix A), which also results food accounting to 42% of commercial and industrial (C&I) waste. However, retail, manufacturing, health care and construction also generate relatively large volumes of waste, including significant fractions of paper/cardboard, plastic and wood.

Increased recycling of food organics and packaging would lift the recovery rate and replace even more virgin materials, while any remaining mixed wastes are likely to be suitable for processing through an AWT facility to recover a secondary level of value.

The Strategy proposes targeted initiatives for key sectors and new services and infrastructure to incentivise and support local businesses to reduce waste and increase recycling.

KEY GOALS

- ✔ By 2025, exceed the state target around reducing the number of litter items
- ✔ 80% of tourism / hospitality operators participating in a commercial waste reduction scheme by 2025
- ✔ Facilitate the expansion of FOGO collection to suitable businesses

WORK WITH BUSINESS AND TOURISM SECTOR TO REDUCE WASTE TO LANDFILL		Timeframe (Years)		
		Short (1-3)	Medium (4-7)	Long (8-10)
1. Commercial waste collection				
1.1	Conduct ongoing kerbside bin campaign, audit and inspection programs, including: • Visual contamination audits • Enhance use of In-Vehicle Monitoring System by collection contractor • Composition audits every 3 years, or as required • Other campaign/program in response to evolving issues.			
1.2	Engage commercial waste service providers on opportunities to improve scope and coverage of recycling services, in particular recovery of commercial organic waste.			

2. Engage local business community				
2.1	Engage with generators of C&I waste and others involved in the supply chain to: • Adopt 'Waste Free Byron' campaign, including logos/marketing • Continue 'Plastic Free Byron' program for businesses (focused on single use plastic products) and consider expanding to other streams • Continue to support NSW Bin Trim audits and engagement • Participate in NEWaste 'Waste Warriors'.			
3. Tourism industry campaign				
3.1	Develop additional education campaigns where necessary and promote current campaigns.			
3.2	Develop targeted anti-littering and waste avoidance campaign as part of the overall digital communications strategy, supported by messaging at hotels and Tourist Information Offices.			
3.3	Expand / enhance public place signage.			
4. Tourist / rental household waste				
4.1	Develop an education campaign to reduce the contamination of tourism waste in the domestic waste stream.			
4.2	Explore options to enforce recycling requirements at house-based accommodation, such as a mandatory waste management plan or additional commercial collection.			
5. Sustainable Events				
5.2	Extend the Boomerang Alliance 'Communities Taking Control' program to events where necessary.			
5.3	Improve event waste management infrastructure e.g. wash up stations and cup exchanges.			
5.4	Promote the container deposit scheme (CDS).			
6. Circular Economy				
6.1	Promote and preference (where viable) local recyclers for Council-generated waste, in particular from Council construction projects.			
6.2	Promote and preference (where viable) local processors and manufacturers for procurement of recycled material.			
6.3	Consider an industrial ecology platform for a materials exchange among local businesses.			
6.4	Encourage local innovation and investment in the resource recovery and recycling processing industry.			
6.5	Update the sustainable procurement plan to provide a broader framework to assess Council purchases.			
6.6	Investigate purchasing glass sand back from Northern Rivers Waste to close the loop on local recycled glass.			
7. Development controls				
7.1	Review Council's relevant Development Control policies and legislation – including for multi-use, medium-to-high density and tourism-related developments – to legislate best practice resource recovery and waste management practices, including adequate recycling capacity.			
7.2	Consider options to improve compliance with the approved construction and on-going operations for commercial development.			

OBJECTIVE 4 – LOBBYING FOR POLICY REFORM

Byron Shire's waste activities operate within the context of regional, state and national policy. Broader reform is required to support more ambitious improvements in waste outcomes, such as opportunities around the circular economy and AWT infrastructure. Council will be an active supporter of these reforms, both directly and through the regional forums of the Northern Rivers Joint Organisation (NJRO) and NEWaste.

KEY GOALS

- ✔ Adopt and advocate aspirational principles, targets and solutions on waste at the NSW Government and regional level
- ✔ Actively participate in all relevant NJRO and NEWaste actions and consultations
- ✔ Lobby for clearly defined policy, sufficient funding and other support to develop an Australian-based recyclables processing industry

SUPPORT AND LOBBY OTHER TIERS OF GOVERNMENT TO HELP REDUCE WASTE GENERATION AND DISPOSAL		Timeframe (Years)		
		Short (1-3)	Medium (4-7)	Long (8-10)
1. Engage the NSW and Federal governments to advocate bigger picture policy review and reform, aligned with BSC strategic objectives				
1.1	Key areas for attention include, but are not limited to: • On-going funding and grant support, particularly for recycling infrastructure and education and awareness programs • Policies and programs to reduce waste generation • Robust packaging covenants and programs to reduce the volume of packaging and increase its recyclability • Clear policy and guidelines on Energy-from-Waste developments • Long-term planning and streamlined approvals for strategic waste infrastructure projects • Any general waste regulation, policy and standards that have implications for Byron Shire strategic objectives.			

APPENDIX A KEY WASTE DATA

HISTORIC WASTE VOLUMES

To understand Bryon Shire's historical waste trends waste profile, Arcadis has assessed available historical data on all wastes received at BRRC from 2012-13 to 2017-18, which includes household kerbside, bulky waste (collected and dropped off), a proportion of commercial and industrial (C&I) waste and minor volumes of construction and demolition (C&D) waste.

A summary of waste generation, recovery and landfill is provided in ***Table 3***, with monthly data graphed in ***Figure 8*** to highlight the composition and trends in waste generation.

Table 3: BRRC waste receival over the last five years (tonnes)

Summary	2012-13	2013-14	2014-15	2015-16	2016-17	2017- 18
Total waste received	28,310	23,705	24,649	26,420	26,406	31,602
Total material recycled	11,832	9,789	10,454	14,458	15,015	15,470
Total waste to landfill	16,478	13,916	14,195	11,962	11,392	16,131
All streams Diversion Rate (%)	42%	41%	42%	55%	57%	49%

The overall recycling rate for materials received at BRRC fell in 2017-18 due to a significant increase in private sector C&I waste received at the site and transferred elsewhere, as illustrated in *Figure 8* below. It does not impact the MSW kerbside recovery rate, which was 57% in 2017-18.

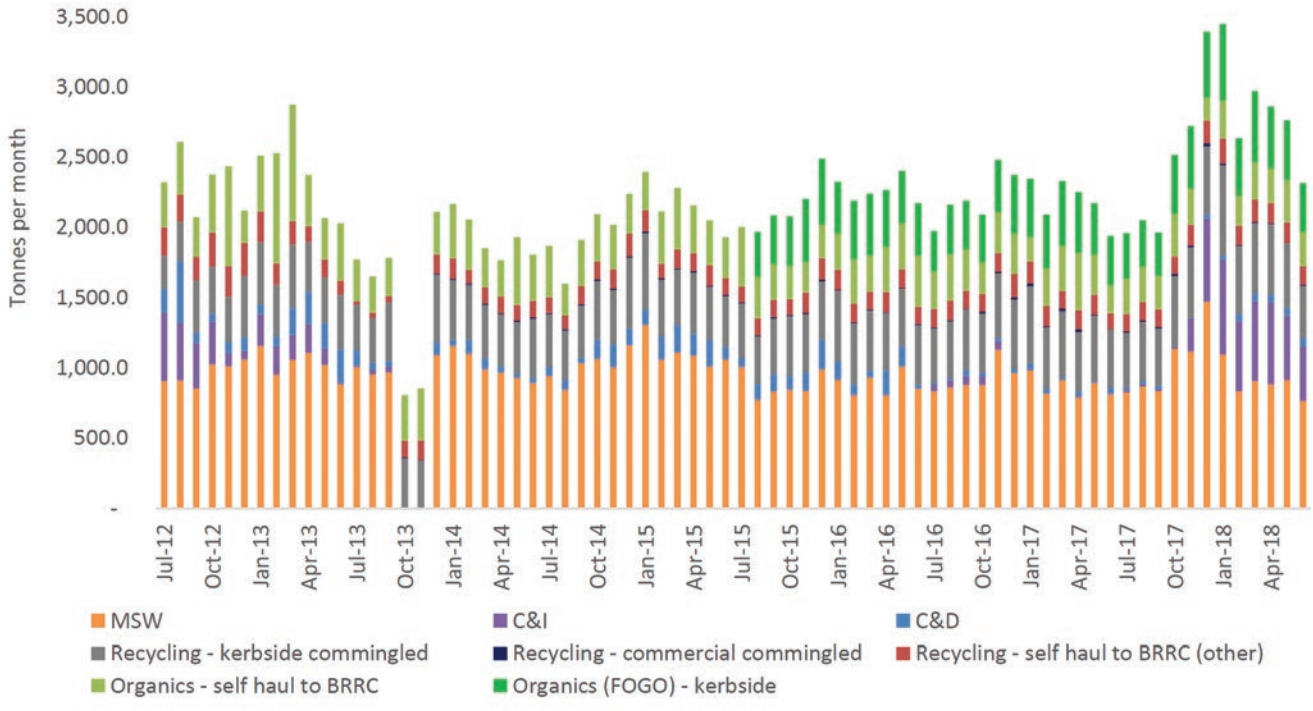


Figure 8: Total waste managed by Council
(October 2013 data missing due to change from Myocum to external landfills

The review of historical data highlight the following trends:

- The total volume of MSW landfilled stepped down with the implementation of the FOGO collection system in August 2015, however it has risen since then due to a significant increase in the volume of bulky waste, which is a key focus in the strategy.
- Kerbside MSW to landfill has continued to decline since the FOGO service. The quantities of FOGO collected since August 2015 have grown slightly year-on-year since commencement in August 2015 but it is difficult to identify clear trends in a relatively short period of time and given the season impacts on this stream
- There are clear seasonal trends in both waste generation and recycling rates, which is particularly apparent in the kerbside collection tonnages. This is partly attributed to the impact of waste from tourists and temporary residents. For example, peaks in January each year reflect the summer holiday period when tourism is at its most active, with the waste from short-term rental accommodation collected as part of the municipal stream.

HOUSEHOLD WASTE PER PERSON

Waste generation is primarily influenced by changes in population but also economic activity (consumption and production), policy drivers, market trends and consumer behaviours. There is a close correlation between the volume of MSW generated by each resident and the economic performance of the Shire ***(Figure 9)***.

Per capita generation has been growing steadily, with the exception of a temporary drop in 2013-14 due to a brief decline in the local economy.

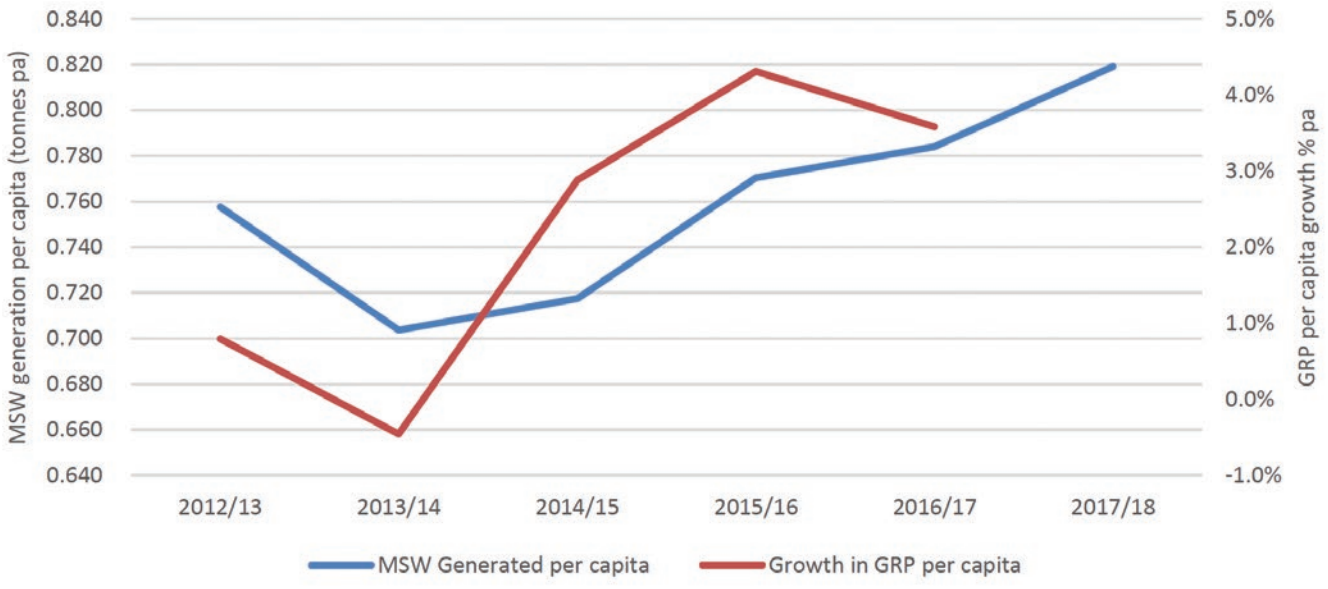


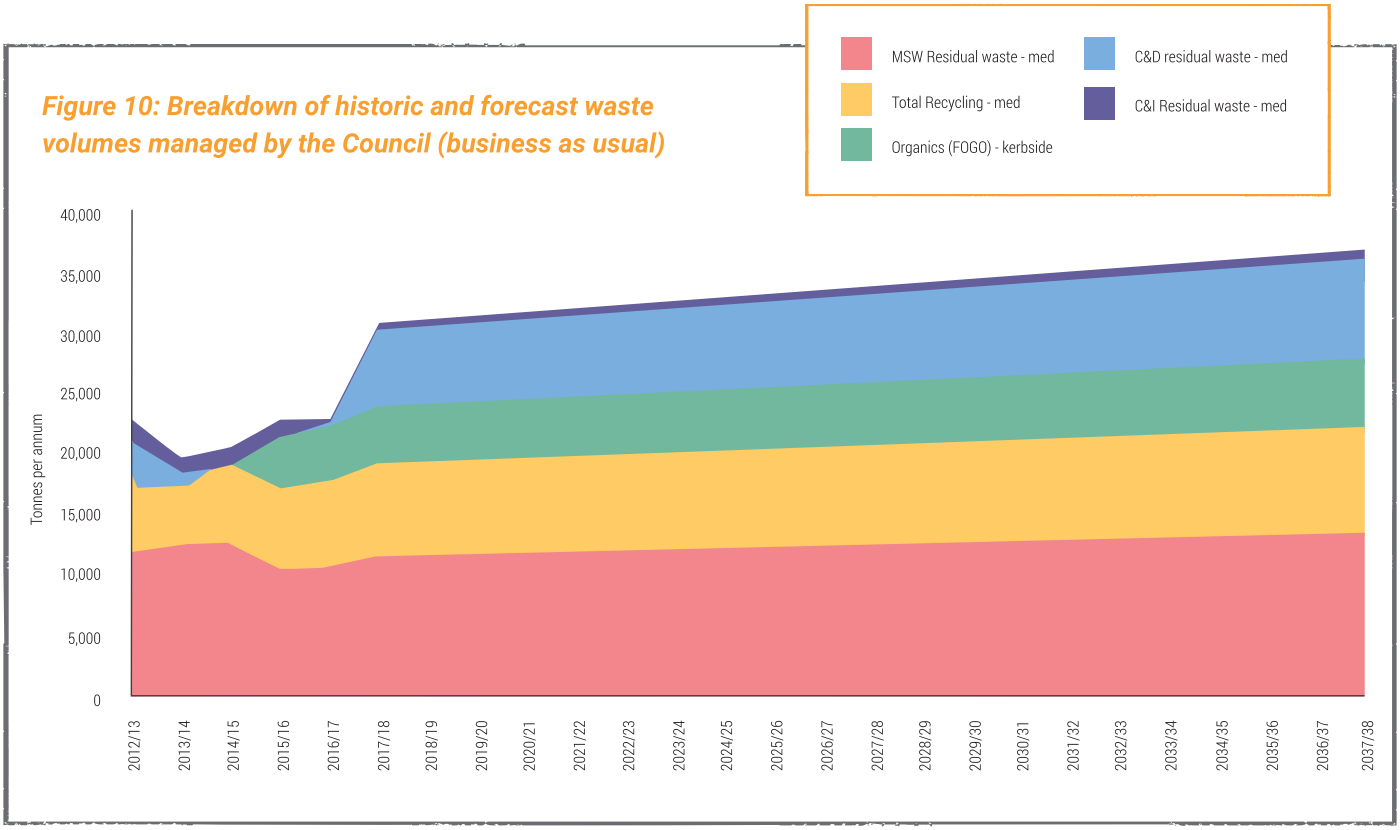
Figure 9: MSW generation per capita versus growth in Gross Regional Product (GRP) per capital

FUTURE WASTE PROJECTIONS

The historical data was used to form the baseline for projections of future waste generation. The business-as-usual (BAU) projections assume no change in terms of current recovery rates of recyclables or organics, while broader trends at the national and state level were used to refine landfill and recovery rates in the alternate scenarios.

A breakdown of all major streams managed by BSC is illustrated in ***Figure 10***, assuming a medium growth scenario based on population growth and estimates of expansion in business waste, with is also closely linked to the economy but more difficult to predict..

Figure 10: Breakdown of historic and forecast waste volumes managed by the Council (business as usual)



The medium growth scenario produces the following forecasts over 20 years to 2037-38:

- Total MSW grows from 27,000 tonnes to around 31,500 tonnes
- Of this, the residual, red bin waste rises from 18,500 tonnes currently to around 22,500 tonnes
- C&I waste managed by Council rises from 6,500 tonnes to 8,500 tonnes, with negligible recycling
- C&D waste volumes are held constant, but this stream is difficult to forecast as Council only received 433 tonnes in 2017-18 and it is likely the majority of what is anticipated to be a significant volume is currently managed outside the region.

COMPOSITION OF MSW KERBSIDE

A 2018 audit of the Municipal Solid Waste (MSW) kerbside stream determined residual waste generation was 5.8 kg per household per week, with people in detached housing generating 44% more (on average) than those in multi-unit apartments.

The average composition of residual waste is illustrated in ***Figure 11***, with waste types condensed in an indicative categorisation to help identify recovery potential and pathways.

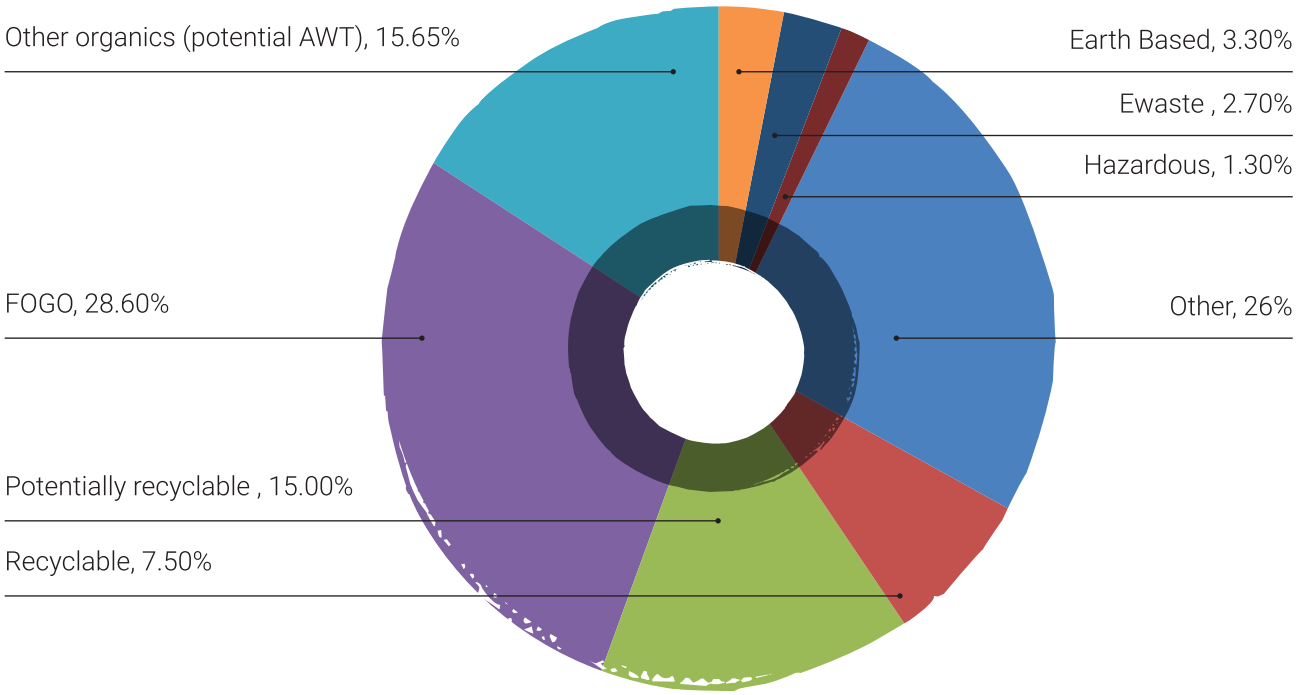


Figure 11: Composition of MSW kerbside residual waste to landfill stream (2016 audit).

Despite the introduction of the FOGO service in 2015, there remains considerable recoverable material in the red bin, including food scraps, recyclable items and other organics that, while not clean enough to compost within the FOGO stream, could be recovered through other AWT processes. It also shows that not all food waste is put in the FOGO bin, with a significant proportion still in the red bin.

This demonstrates a significant opportunity to improve diversion of the residual stream by improving existing systems and introducing alternative recovery efforts. The composition of the FOGO fraction remaining in the waste bin and the 'other organics' stream is broken down in ***Figure 12.***

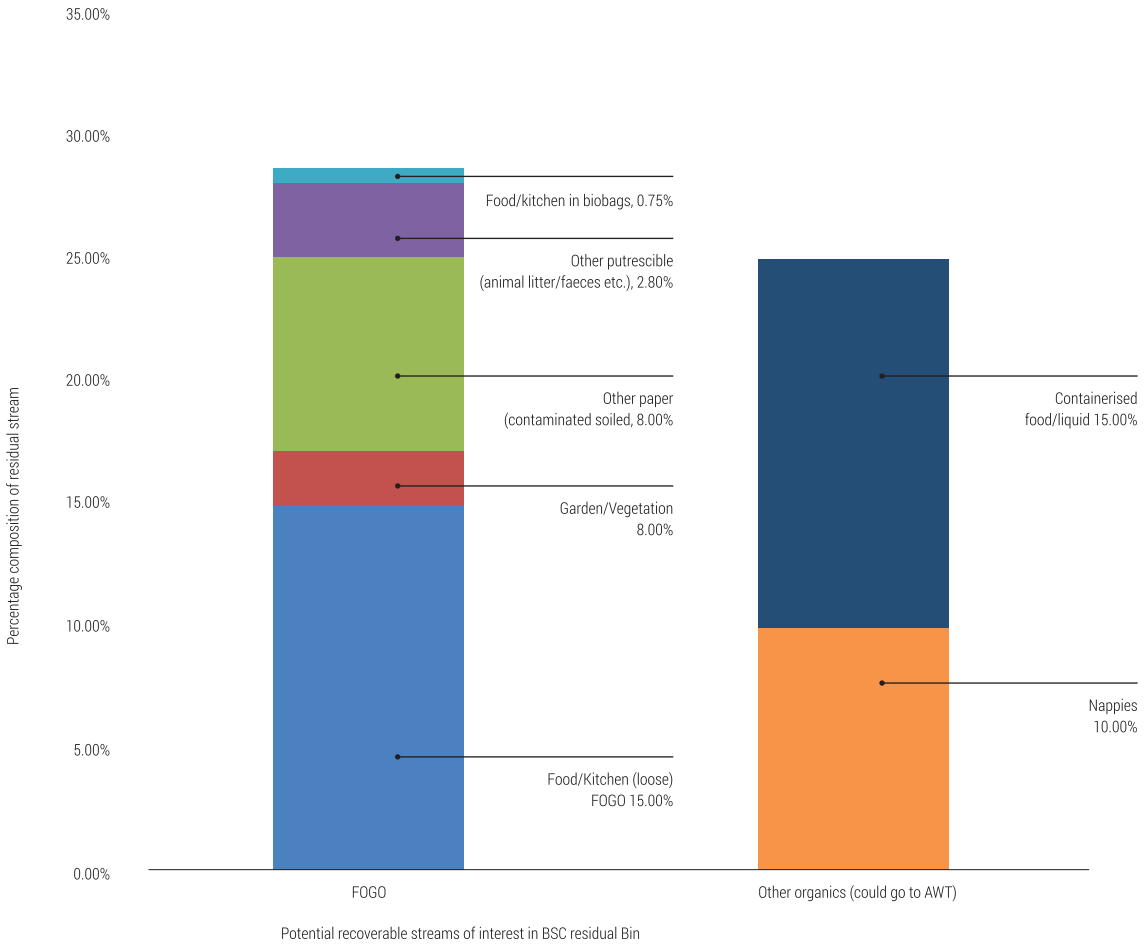


Figure 12: Composition of organics streams of interest in the Council kerbside residual stream

The key conclusions relevant to future organics recovery efforts are:

- Approximately 29% of the residual stream is comprised of food and garden organics, presenting an opportunity to tailor messaging within FOGO education campaigns
- An AWT solution would target the full stream of organics, including the 25% of the residual waste stream, such as nappies, which are useful feedstocks for AWT technologies.

SOURCES OF BUSINESS WASTE

The tourism industry plays a vital role in the Shire's economy and is a significant source of waste, most of which goes into the commercial stream but with a significant volume collected from short-term rentals appearing in the MSW stream.

Figure 13 estimates the break down of C&I waste by source, with major volumes through accommodation, food services and retail. Manufacturing and healthcare are also key contributors.

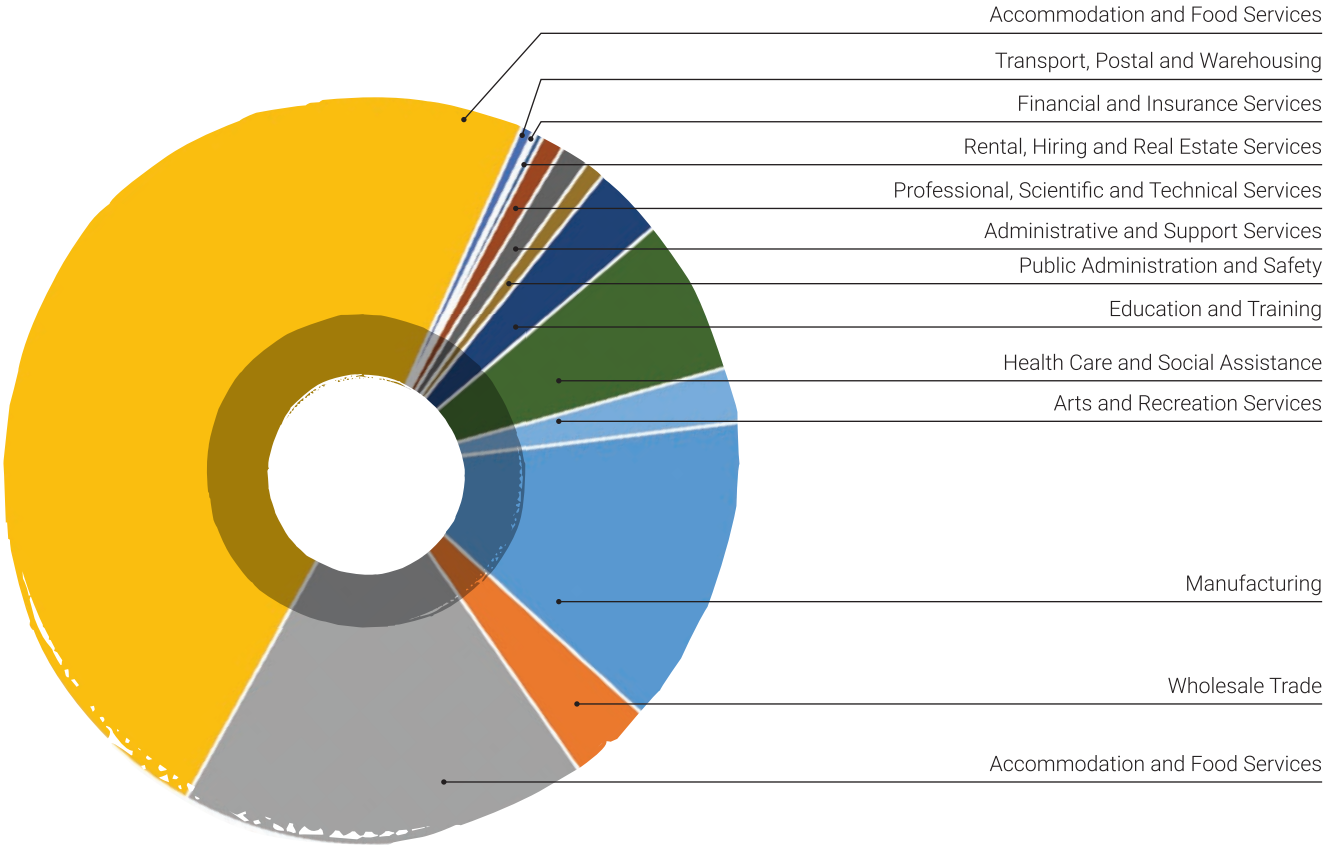
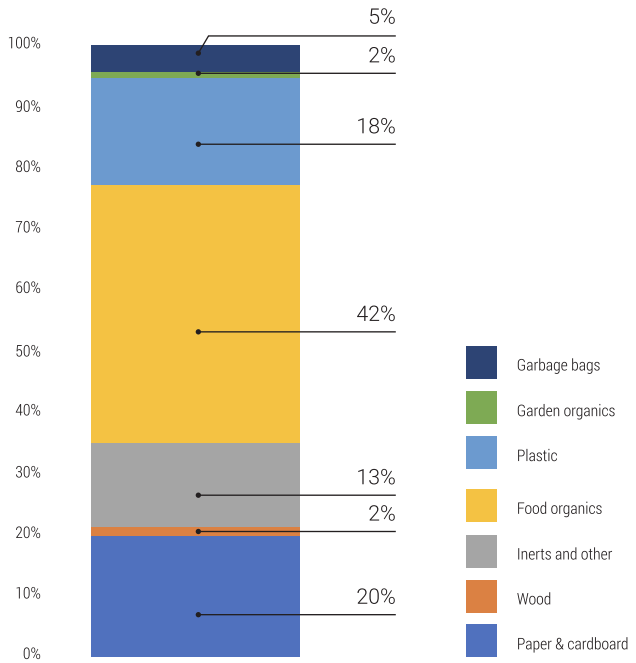


Figure 13: Anticipated key sources of waste, based on typical waste generation in each sector.

An indicative compositional breakdown of the residual waste stream from the business sector is illustrated in ***Figure 13***. This data is modelled for the entire Byron business community, based on the economic mix in the Shire and indicative waste generation for each industry type, based on NSW state-wide C&I residual waste stream audit data.

The significant volume of food waste going to landfill is evident, and is not surprising given the large scale of the accommodation, food services and retail sectors in Byron.



CARBON IMPACTS

Council carbon emissions studies estimate the waste sector accounts for 3% of the annual greenhouse gas emissions generated by the entire Byron Shire's community. When considered just as a proportion of Council's carbon emissions footprint, it is the largest source at 41%, largely through the generation of methane gas in landfill ***(Table 2)***. If we want to be carbon neutral as a community, the imperative to address waste to landfill is clear.

Table 4: Council greenhouse gases by source (Net Zero Emissions Strategy for Council Operations 2025)

Sector	Description	Emissions (tonnes CO2e)	% of Council	% of Community
Landfill Fugitive Emissions	Fugitive emissions from solid waste disposal on land. (Note, fuel and electricity usage emissions encapsulated in other sectors).	10,744	41%	3%
Sewage Treatment Plants Fugitive Emissions	Fugitive emissions from organic waste water decomposing in the ponds as it is being treated.	8,955	34%	1%
General Electricity	From generation and distribution of baseload electricity	4,865	19%	66%
Transportation	Diesel and petrol consumption. Council estimate based on Council fleet.	1,128	4%	30%
Street Lights	Electricity used by streetlights	635	2%	-
Bottled Gas	LPG bottled gas used at Council assets.	39	0.1%	-

TOWARDS ZERO
Byron Shire's Integrated Waste and Resource Recovery Strategy 2019-2029

Byron Shire Council