



CENTRAL COAST
WASTE RESOURCE
MANAGEMENT
STRATEGY
2020-2030



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GLOSSARY

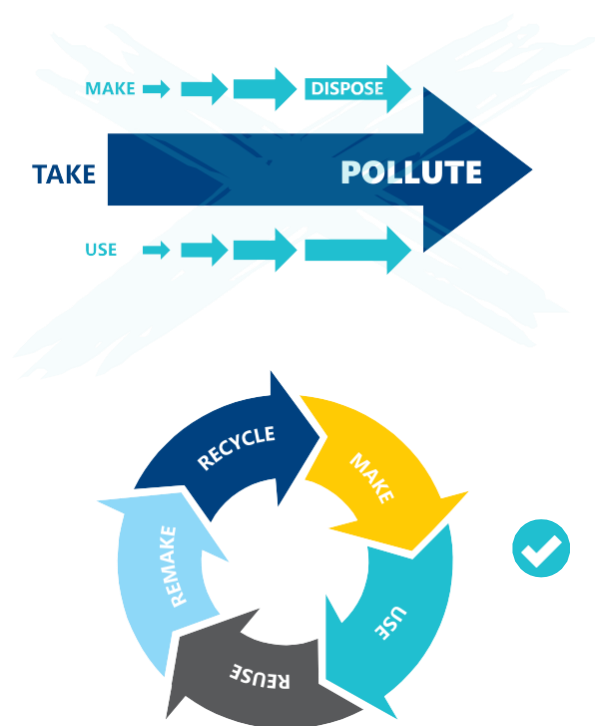
Acronym	Meaning
AWT	Alternative Waste Technologies
C&D	Construction and Demolition
C&I	Commercial and Industrial
CDS	Container Deposit Scheme
CPP	Cities Power Partnership
CRC	Community Recycling Centre
DCP	Development Control Plan
DPIE	NSW Department of Planning, Industry and Environment
EfW	Energy from Waste
EPA	Environment Protection Authority
FOGO	Food Organics and Garden Organics
MLA	Metropolitan Levy Area
MSW	Municipal Solid Waste
MRF	Materials Recovery Facility
MUDs	Multi-Unit Dwellings
POEO Act	Protection of the Environment Operations Act 1997
RDF	Refuse Derived Fuel
ROCs	Regional Organisation of Councils
RVM	Reverse vending machine
SUDs	Single Unit Dwellings
VWMGs	Voluntary Waste Management Groups
WARR	Waste Avoidance and Resource Recovery

1 INTRODUCING OUR STRATEGY

A century ago, in 1920, Frederick Talbot in his book 'Millions From Waste' wrote that "Waste is merely raw material in the wrong place". Our Central Coast 2030 Strategy is underpinned by the modern view of that same philosophy from 100 years ago – "waste is a resource to be managed and not a problem to be rid of".

The key drivers and actions identified in this Strategy have been developed from extensive community feedback and reflect a modern community's needs and aspirations for a sustainable circular economy.

Throughout the world there is an increased understanding of the negative impacts that waste and wasteful behaviours have on our environment and available resources. It has been well documented that the current linear (take – make – use – throw) use of valuable resources is unsustainable in the long term and society needs to move to the circular economy.



In addition to the positive environmental impacts associated with the principles of a circular economy, there are significant local economic benefits gained by transitioning to resource recovery.

The National Waste Policy 2018 noted the waste management and resource recovery industry is no longer just an essential service; it is now a significant contributor to Australia's economy, with an annual turnover of \$15 billion and 50,000 full time equivalent employees across the country.

Modelling by the Centre for International Economics (2017) suggests that a 5% increase in the recycling rate could add \$1 billion to Australia's Gross Domestic Product (GDP). If we look only at the domestic waste stream and aspire to the higher performance levels being achieved by some councils in Australia, there is the potential to add \$4 billion to the Australian GDP just by all councils achieving the same levels of Resource Management.



The National Waste Policy 2018 also noted that just over 9 jobs are created for each 10,000 tonnes of waste recycled. If we apply that to the additional 3 million tonnes that could be recovered by all councils achieving the same as the best performers, we have the potential to create almost 3,000 new jobs in the recycling industry and even more if we utilised those recycled materials by developing the circular economy within Australia instead of export. That's at least 1 new job for each 3,000 households that could be created locally.

It is this feedback, together with society's increased interest and desire to mitigate our negative environmental impacts, that has underpinned our Resource Management Strategy and objectives.

The vision guiding the Central Coast Waste Resource Recovery Strategy is:

Promote the Central Coast as a creative environment for developing a local circular economy that values the recovery of resources and advocates prevention of waste

Overarching priorities:

- Reduce the waste generated on the Central Coast
- Reduce waste landfilled on the Central Coast
- Increase recycling options available on the Central Coast
- Explore funding opportunities to facilitate waste avoidance and diversion.

These overarching priorities are oriented around four objectives, which work together to provide waste services that are safe, secure, cost-effective and deliver the recovery outcomes desired by the Central Coast community. These four objectives are supported by a suite of actions that are to be delivered over the life of the Strategy. They are summarised below and presented more fully in Section 5.

OBJECTIVES

ACTIONS

01.

Drive waste avoidance

- 1.1** Enhance community awareness and action around waste avoidance and reuse through targeted education campaigns
- 1.2** Engage local businesses to support uptake of opportunities for avoidance of waste and increased recycling
- 1.3** Identify avoidable Council waste streams and improve waste management behaviours
- 1.4** Enhance the sustainability focus in Council procurement to close the local loop

02.

Deliver a step change in diversion from landfill and build a circular economy

- 2.1** Investigate and plan for a large-scale waste processing solution for Food Organics and Garden Organics (FOGO)
- 2.2** Explore the viability of an integrated resource recovery precinct(s) to maximise recovery of resources from a wide range of local waste streams
- 2.3** Assess targeted recovery options for a broader range of household items, including salvage from kerbside collection and waste dropped off at landfills, and the viability of a resale or hire shop
- 2.4** Optimise existing waste management facilities to better sort, extract and recycle dry wastes
- 2.5** Improve and expand community recycling practices through education and promotion
- 2.6** Facilitate and utilise local end markets for recycled products and materials

03.

Strengthen triple bottom line outcomes

- 3.1** Collaborate with social enterprises and not-for-profit groups in mutually beneficial partnerships
- 3.2** Develop an ongoing dialogue with the community, business and other stakeholders with regards to waste management
- 3.3** Work with other levels of government, stakeholders and NGOs, to advocate for policies and programs that support Council's waste strategy
- 3.4** Continue to optimise waste facilities and services through delivery of efficient and cost-reflective operations

04.

Enhance street and open space appeal

- 4.1** Improve public place waste and recycling services
- 4.2** Explore smart city technology to enhance waste processes
- 4.3** Audit kerbside bins, bulky waste and public place bins to target opportunities to improve recovery
- 4.4** Review best practice bulky waste collection services, including service delivery and education
- 4.5** Review best practice waste storage design and service delivery for residential development, commercial / industrial development and subdivisions



2 KEY DRIVERS

The challenges and opportunities

With the NSW Waste and Resource Recovery (WARR) Strategy coming to an end in 2021-22 and rapid evolution in the global challenge around recycling, the State Government has embarked on development of a 20-year Waste Strategy to generate a long-term direction, integrate new thinking and facilitate new technology. Given NSW is already well short of its 2021 resource recovery goals – currently recovering 41% of municipal solid waste (MSW) against a target of 70% – it may well embrace concepts such as the circular economy, the co-collection of food organics and garden organics (FOGO) and a new framework to consider technologies such as energy from waste and small-scale reprocessing of kerbside recyclables and other streams.

Wasted resources are not just an operational issue for Council to manage. It has many direct and indirect impacts on the sustainability of our lifestyles and environment as landfills are Australia's seventh largest source of greenhouse gases with clear linkages to climate change, which is a focus area in our own Community Strategic Plan 2018-2028.

In July 2019, Council adopted its Climate Change Policy to accelerate actions to reduce greenhouse emission from Council operations to support the transition towards a net zero emissions region by 2050. The outcomes from implementing the Objectives and Actions in this strategy will significantly contribute towards achieving our Zero emissions target

There are clear social benefits too. Transforming so called wastes into secondary resources with additional life not only cleans our community and protects the environment, import replacement helps our balance of trade and builds local resilience. Council understands that transitioning to new skills is of vital importance to keep up with the new technology and processes that will emerge in the evolving waste and resource recovery industry. Council will support the upskilling of the industry, as well as ensuring Council staff receive the training required to remain innovative.

The need and the opportunity are clear. Building on the foundations of our waste system with new approaches, views and principles that avoid, reuse, recycle or recover resources from waste delivers benefits across the triple bottom line.



Community aspirations

The Central Coast community is very clear in its views about the goals and issues around managing Resources and Waste. Almost 90% of surveyed residents rated reducing waste to landfill as 'very important'. To inform this Strategy, Council undertook extensive consultation in mid-2019, engaging the community via workshops, pop-up information sessions, surveys, online quizzes and promotion through both traditional and social media.

With more than 1,300 surveys completed and 151 residents attending the four workshops, the outcome is a clear picture of community priorities, pressures and aspirations.

Changing household behaviours

- More than 75% of survey respondents are likely to change the way they manage waste at home to reduce waste going to landfill. The top suggestions to do this were:
 - Improving recycling rates through the yellow lid recycling bin:

- Consistently using the green lid garden organics bin for garden organics; and
- Taking advantage of the opportunities to recycle through the Return and Earn Container Deposit Scheme (CDS).
- A need for more education to promote waste avoidance, diversion and bin usage was identified as a top priority. Council websites and social media should be supported by community-based education campaigns, such as at schools, libraries and community events. Information should target specific audiences and highlight the relevant short term and long-term benefits.
- Encourage behavioural change through bin inspections and rewarding correct use.

Drop-off opportunities

- Almost half of survey respondents would consider dropping off and buying used household items from a resale shop, while the online discussion forum also elicited strong support for a tip shop or resale shop. There was particularly strong support from residents under 25 years old, who identified this as the highest priority for managing bulky waste.
- A very high 75% of people said they would drop off soft plastic packaging at Council facilities, such as libraries, customer service centres and waste management facilities.
- Drop off opportunities and collection events for household hazardous wastes were also identified as high value in terms of promoting recycling and managing problem waste. Key opportunities include:
 - 71% supported Chemical CleanOut events.
 - 56% supported light globe, battery and mobile phone recycling, which are common problem household wastes.
 - 50% supported e-waste recycling in general, which includes computers, lighting equipment, electronic tools, telecommunication equipment and small appliances, etc.

Improve kerbside recycling

- The following ideas from the community aim to reduce red lid general waste going to landfill:
 - Reduce the size of the red lid general waste bin to help residents think about the amount of waste they generate and encourage avoidance.
 - Change collection frequency to once a fortnight to promote waste avoidance
 - Introduce a separate collection for compostable (FOGO) material.
- The following ideas from the community address the yellow lid recycling bin:
 - Consider additional services to help manage materials that are potentially recoverable but not currently collected through the kerbside system, such as e-waste, light bulbs, solar panels and polystyrene. These are examples of materials that can be recycled through tailored systems. Unfortunately, the current yellow lid recycling bin kerbside collection doesn't have a system that can efficiently and safely manage and sort these materials to ensure the material is recycled and repurposed responsibly.
 - Provide more educational material to help reduce contamination through better sorting.
- The key green waste solutions identified by the community were:
 - Introduce a FOGO collection.
 - Develop or commission a compost or mulch service / facility, to improve conversion of the FOGO material into a beneficial product.
 - Promote composting, which could include introducing a community compost service or provide workshops on how to compost at home.

Perspectives on technology

- The following criteria were identified by the community as the highest priority in assessing potential waste processing technologies:
 - Certainty of diversion from landfill
 - Minimal greenhouse gas emissions to minimise environmental impact
 - Produce an output material with sufficient local market scale and appetite.
- Almost 60% of respondents would be prepared to pay an additional \$50 per year on their household rates to reduce waste going to landfill through new technologies or processes.



93%
would either buy or drop off household items from a resale shop or do both



87%
think it is very important to reduce the amount of waste that households generate and landfill



75%
are likely to change the way they manage waste at home to reduce landfill



71%
consider Chemical CleanOut events as very helpful



55%
support food and garden organic (FOGO) collection



50%
want additional services to help with items that cannot be collected through the kerbside system



40%
of respondents want more waste education



40%
donated to charity the last household item they no longer needed and was in reasonable condition

Waste policy and principles

Waste policies are ever evolving and adapt to reflect the changing industry. Planning for waste management should consider both well-established principles and emerging trends. Governing bodies will be required to be responsive and agile as waste management becomes more challenging and the community becomes more alert to issues and impacts of waste.

Waste Governance

All levels of government throughout Australia have a role in appropriately managing waste and encouraging resource recovery, with a collective framework of responsibilities that cascades from the Commonwealth through to the states and on to regional council groups and local government. These roles are evolving as waste becomes increasingly viewed as a fully domestic responsibility (with no exports) and a valued resource that can be reinjected into the Australian economy.

In terms of waste management, the Commonwealth has been active in international treaties related to hazardous wastes and a small number of national programs, including carbon emissions programs and product stewardship schemes for targeted products including electronic waste.

However, there is growing pressure for more direct national leadership on the strategic challenges and common issues that affect all states and territories.

Historically, state and territory regulators have led the way in defining the opportunities and constraints for waste management. The NSW Environment Protection Authority (EPA) sets the long-term direction via the state Waste and Resource Recovery (WARR) Strategy, while as the regulator it significantly influences the present industry operating environment. The economic drivers for resource recovery have been driven through the Waste Levy, which is set by the State Government.

Local government operates within this state context to provide the on-the-ground operations and waste services to the community. Waste management services are one of the most significant financial commitments Councils make on behalf of the community. Council must ensure that these services are fit for purpose and offer the ratepayer value for money.

Table 1 summarises the roles and responsibilities of Commonwealth, State, Regional and Local Government.

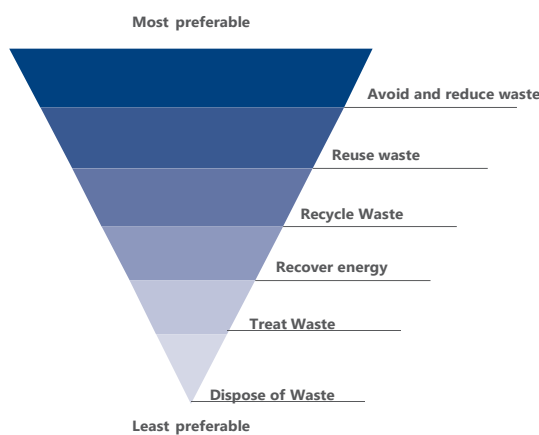
Table 1: The hierarchy of responsibility for waste management

Government level	Responsibility
Commonwealth	<ul style="list-style-type: none"> National Waste Policy 2018 National Packaging Covenant National Packaging Targets National Food Waste Strategy National Television and Computer Recycling Scheme
State	<ul style="list-style-type: none"> Protection of the Environment Operations (POEO) Act 1997 and Waste Regulation 2015 NSW Waste Avoidance and Resource Recovery (WARR) Strategy and 2020-21 targets NSW 20 Year Waste Strategy 2020 (currently in development) Energy from Waste Policy Statement NSW Circular Economy Policy Statement Return and Earn Container Deposit Scheme (CDS)
Regional	<ul style="list-style-type: none"> Local governments may join an urban Regional Organisation of Councils (ROCs) or non-urban Voluntary Waste Management Groups (VWMGs) In early 2017, Central Coast Council participated with the Hunter Joint Organisation of Councils, to develop the Hunter / Central Coast Regional Waste Avoidance & Resource Recovery Strategy 2017-2021
Local	<ul style="list-style-type: none"> Local government provides waste education to the community to inform waste behaviours and ensure residents know how to use the waste systems provided Councils are responsible for collection, treatment and disposal of municipal waste (through in-house operations or contracted services), including kerbside, council generated and illegally dumped or littered waste Councils are encouraged to meet state targets (with some state funding for waste programs), however each councils' appetite to meet these targets is usually a function of their politics and priorities and the available infrastructure and services Central Coast Community Strategic Plan (CSP) 2018-2028 – Maintaining our natural assets is a core community value. Keys to our approach are: ongoing education (such as reducing litter and minimising waste); inviting the community to take a hands-on role in environmental conservation, protection and remediation; and championing renewable energy in our future design and planning to minimise the impacts of climate change in our region. Green objectives – Two CSP objectives have specifically informed the Waste Strategy: Reduce littering, minimise waste to landfill and educate to strengthen positive environmental behaviours (E3); and Improve enforcement for all types of environmental non-compliance, including littering and illegal dumping, and encourage excellence in industry practices to protect and enhance environmental health (F3).

Waste Hierarchy

The waste hierarchy is the core guide used globally to prioritise approaches to waste management on the basis of environmental impacts and sustainability (Figure 2). The hierarchy is the core conceptual framework behind the NSW WARR Strategy and helps to inform this Strategy. It recognises the benefits across the supply chain of avoiding consumption and reuse, the materials benefits in recycling waste back into new products and the energy value when all other recovery is exhausted.

Figure 2: The waste hierarchy guides preferred outcomes



Typically, local governments have more control over the lower portion of the waste hierarchy as the responsible entity for providing waste collection, processing and disposal services for municipal waste. However, councils are starting to consider how they can address the higher order options in response to the emerging challenges in managing waste. As a result, the first objective within this Strategy is to drive waste avoidance.

Circular Economy

Recognition of the need for a less linear approach to materials flowing through the economy has led to development of the circular economy model, which aligns with the hierarchy but seeks to present a more active indication of pathways and priorities (Figure 3).

To establish a more self-sustaining circular economy, all aspects of the economy need to be considered, from the extraction of resources, to design and manufacturing all the way through to the consumers who use these products and end of life management.

The concept is based on seven principles outlined in the NSW Circular Economy Policy Statement;

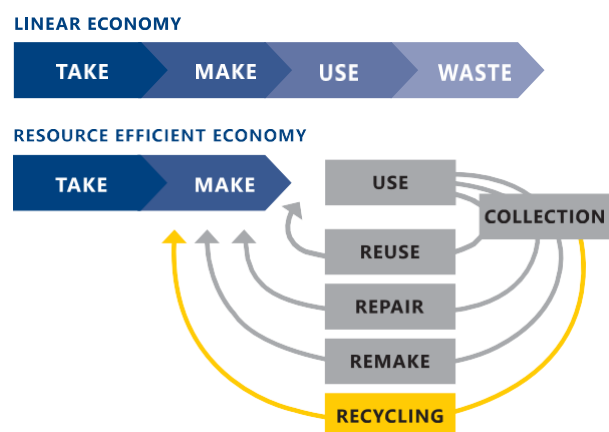
1. Sustainable management of all resources
2. Valuing resource productivity
3. Design out waste and pollution
4. Maintain the value of products and materials
5. Innovate new solutions for resource efficiency
6. Create new circular economy jobs
7. Foster behaviour change through education and engagement.

In general, the earlier in the circle the more effective the intervention, with 90% of the lifecycle impact of many products determined at the design stage. While Council has limited influence on how products are designed and manufactured, it has a key role in providing the capability to reuse or recycle materials and keep them 'circulating' in the productive economy for as long as possible.

Practical examples of initiatives at each stage of the circle are outlined below:

- Manufacturers use recycled materials in their processes and design products for disassembly to further promote product repair and material recycling, extending their lifetimes.
- Retailers advocate for, and are open to, new business models, whether selling second hand and refashioned items or selling a service rather than the product.
- Consumers, including businesses and Council, consider sustainability in their procurement and for unwanted items pursue the highest feasible outcomes in the waste hierarchy.
- Council prioritises resource and energy recovery through the waste services it contracts on behalf of the community.

Figure 3: A circular economy retains materials in their highest productive use





3 WHERE ARE WE NOW?

The Central Coast in profile

The Central Coast Council area is approximately 1,681 km², over half of which is classified as national park or protected areas.

It has 80km of coastline and neighbours the local government areas Lake Macquarie and Cessnock to the north, Hawkesbury to the west and Hornsby to the south.

The area is easily accessible by the M1 (Pacific Motorway) and the Central Coast and Newcastle Line of intercity rail. The largest population centres are Gosford, Tuggerah-Wyong, Erina, Woy Woy and The Entrance, all of which are located in the eastern region.

West of the M1 is low density and primarily classified as natural asset, productive land and rural lifestyle and National Park and Reserve / State Forest.

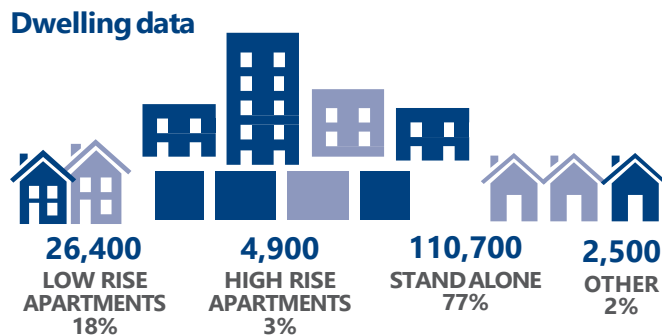
The Central Coast population is 342,047¹ and mostly English speaking. Some 35.8% speak a language other than English at home, including Mandarin, Arabic, Cantonese, Greek, Spanish, Italian and Filipino.

Growth has been steady over the last decade at an average 0.914% per year. There are more than 130,000 residential premises in the council area, predominately comprised of stand-alone houses (76.6%), followed by medium density homes (18.3%) and a small proportion of high-density dwellings (3.4%). Reference: <https://profile.id.com.au/>

¹ <https://economy.id.com.au/central-coast-nsw>, June 2018

However, density is growing. By 2036 the population is expected to grow by 19.67% to 414,615 people (Figure 5), with an additional 41,500 dwellings needed to meet this new demand, including a higher proportion of residents living in multi-unit dwellings (MUDs).

The 2016 census showed that there are around 22,000 registered businesses on the Central Coast, creating 115,443 jobs. The top three industries within the local government area are health care & social assistance, retail and accommodation & food services, which are key waste generating sectors. There were more than 7.8 million visitors to the local government in 2017/18, accounting for 3.07% of all visitors to the state and around 9% of total tourism expenditure in regional NSW.



Central Coast Council area

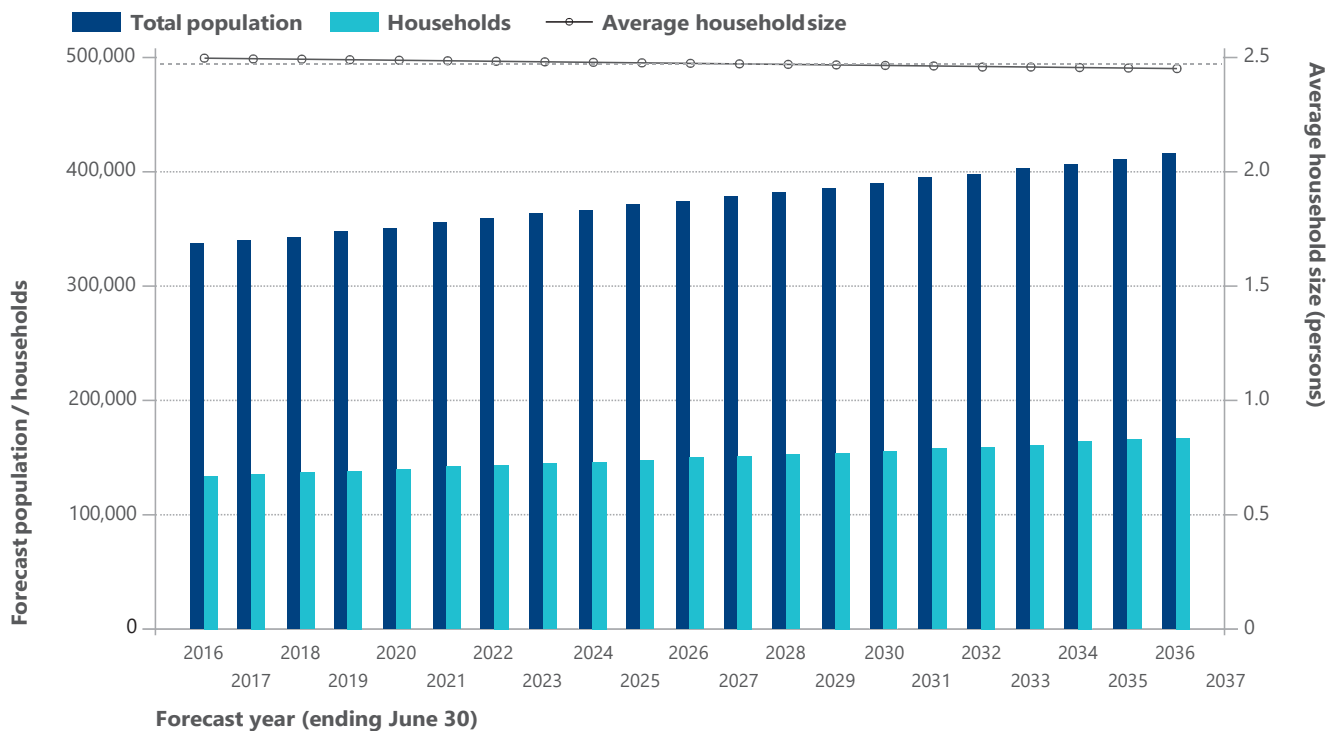


Figure 5: Population and household forecasts, 2016 to 2036



Figure 6: The standard bin configuration for stand-alone houses east of the M1

Our waste services

Household waste collection

Collection of waste and recyclables from households is a core local government responsibility. Waste collection contracts are long-term commitments due to the significant investment by the contractor in vehicles, facilities and staff. A collection contract commenced in 2018 covering all household waste streams and the entire Central Coast region, one of the largest waste collection systems in Australia.

The services are tailored to the diverse needs of the region, with different bin configurations in urban and rural locations. The higher density areas east of the M1 contain stand-alone single unit dwellings and multi-unit dwellings (MUDs) that include townhouses and apartment blocks.

The standard service offers the following collections:

- One 140 litre red lid general waste bin, collected weekly
- One 240 litre yellow lid recycling bin, collected fortnightly
- One 240 litre green lid garden organics bin, collected fortnightly
- On-call bulky waste collections, six (6) per year.

The rural areas west of the M1 are characterised by single unit dwellings and often larger block sizes. The standard services are:

- One 140 litre red lid general waste bin, collected weekly
- One 240 litre yellow lid recycling bin, collected fortnightly
- On-call bulky waste collections, six (6) per year.

Variations to the standard bin services are offered to suit the wide diversity of residential areas and individual needs within the Central Coast region. For a small additional fee, residents can increase the frequency of, or upsize their red lid general waste bin to 240L and 360L. Residents can also increase the frequency or size of their yellow lid recycling or green lid garden organics bin service (360L). In addition, MUDs may also share larger bulk bins for their waste and recycling.

Commercial waste collection

Council waste services are offered to some small businesses, including restaurants, cafes, food outlets, retailers and offices, as well as schools, pre-schools and surf lifesaving clubs.

Collection is available as part of the household waste collection run and only picks up kerbside wheelie bins.

However, most commercial and construction waste on the Central Coast is collected by private operators directly contracted by the waste generator. Commercial and construction generators and their operators make the decisions on the collection, transport, and ultimate destinations for their waste. It does not fall within Council responsibilities and there is no local data on these waste streams.



Additional services

- Litter bin services – Council operates an extensive network of nearly 2,500 public place litter bins for waste and recycling across the region, with a primary focus on high-use public areas such as retail, recreational, sporting, tourist and transport sites
- E-waste recycling program – Each year residents can drop off major e-waste items for free at the Council waste management facilities, including computers, keyboards, photocopiers, TVs and microwaves
- Household chemical collection – Residents can make use of four free chemical clean out events per year, covering items such as paint, pesticides, motor oils, gas bottles, pool chemicals, fluorescent tubes and unwanted medical items
- A Community Recycling Centre (CRC) – A CRC is under construction at Buttonderry Waste Management Facility and when open will accept wastes such as paint, motor oils, cylinders, lead acid batteries, household batteries, fluorescent tubes and globes
- Waste education – While not a conventional service, waste education is a critical Council function to avoid waste and optimise recovery. Council operates popular waste education centres at Woy Woy and Buttonderry Waste Management facilities, but this Strategy will expand these education programs through new channels and across numerous demographic groups
- Scrap metal drop off – Residents and businesses can drop-off scrap metals for free at Council waste management facilities, including ferrous and nonferrous metals, car bodies, white goods and all other primarily metal containing products such as barbeques, trampoline frames and bikes.



Planning approvals for waste services

Increasing building density in our urban centres influences the design and amenity impact of waste services. An important control over new apartment development is Council's control over the configuration of waste services for the building through the Development Approval process.

The Development Control Plan (DCP) stipulates aspects such as waste storage area and collection regime, depending on the scale of the building. Each development proposal is subject to detailed review of its adequacy for waste services, support for recycling, impact on streetscapes and mitigation of safety risks.

A revised DCP currently under development will update controls for the modern Central Coast and support Council's ability to mandate and monitor building development.

Closing the loop on mattresses

In 2018-19, Central Coast Council implemented a mattress recycling program allowing residents to either include mattresses in their booked kerbside collection (free of charge), or drop them off at the Council waste facilities (fee charged). In the last 12 months, more than 22,000 mattresses from the Central Coast area have been recycled, diverting this bulky waste stream away from landfill into new products.

Recently, some of these mattresses have been processed by a social enterprise in country NSW, which has provided valuable work experience and skills to people with indigenous backgrounds, including school leavers and long term unemployed. The mattresses are deconstructed and components such as metal, foam, wood, plastic and textile flocking are recycled. The metals go into new train wheels, the foam becomes carpet underlay and the remaining components are used as biofuel.



Where does your waste go?

Current infrastructure

The Central Coast is well supplied with household waste and recycling infrastructure. Council operates three major waste management facilities across the local government area to cater for household and commercial waste. All are open to the public seven days a week, except for Christmas, New Year's Day and Good Friday.

Garden organics are collected and processed at a composting facility located at Councils Buttonderry Waste Management Facility.

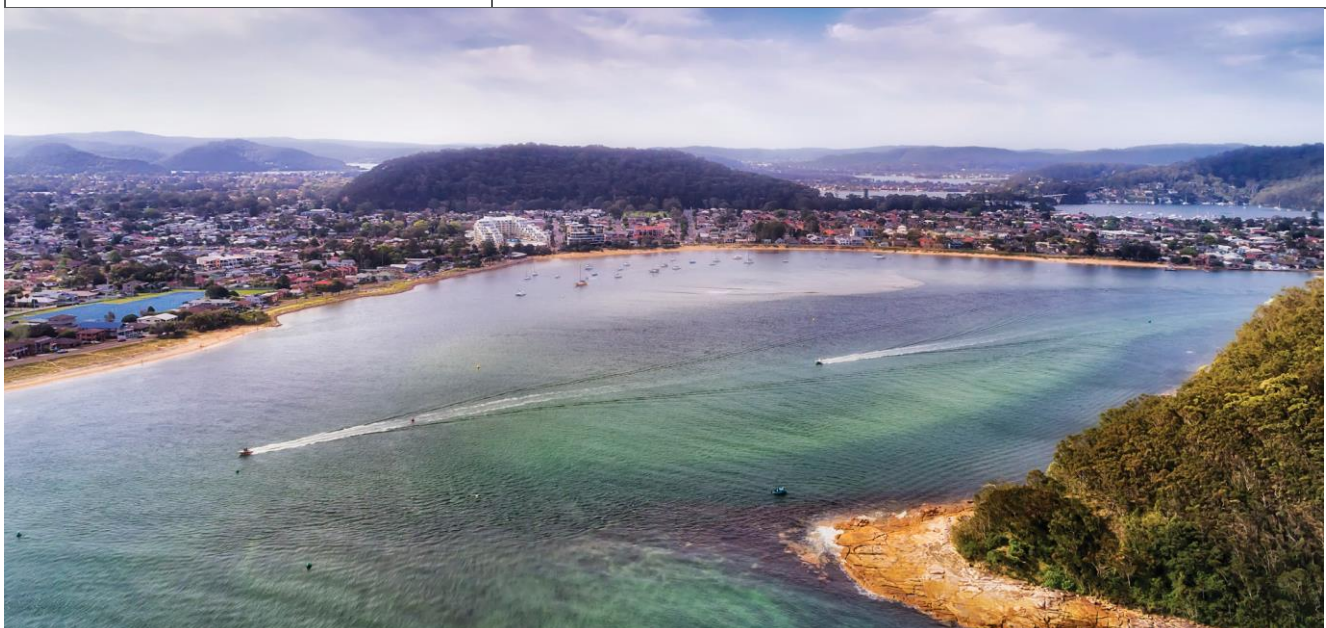
Recyclables are processed locally under contract at a Materials Recovery Facility (MRF) located at Somersby, which accepts both household and commercial recyclables.

There are also a limited number of privately-operated waste facilities, primarily smaller sites focused on construction waste. There are no other facilities licenced to accept putrescible household residual waste in the local government area. There are however a number of commercial operators who transport commercial, construction and putrescible waste for disposal at facilities outside of the local government area.

Buttonderry	
Type of Facility	<p>Integrated Waste Management Facility encompassing:</p> <ul style="list-style-type: none"> • Landfill • Green waste processing facility • Drop-off facility for batteries, motor oil, tyres and other specific types of waste including e-waste • Sorting and recycling area for scrap metal waste • Materials recovery area for sorting and recovery of concrete, bricks and tiles • Biosolids processing • Waste education centre and garden • Community Recycling Centre for problem household wastes due to open in 2020
Capacity	Licensed to receive 250,000 tonnes per annum (140,000 tonnes to landfill and 110,000 tonnes to recovery)
Primary Wastes Accepted (see website for more)	<ul style="list-style-type: none"> • Putrescible waste • Non-putrescible waste • Asbestos • Tyres
Primary Direct Users	Residents and businesses in the northern part of the LGA, and potential to service Sydney and the Hunter region due to proximity to the M1
Remaining Life	Approximately 30 years in the current operational area (at current disposal rates), with the potential for further expansion within the site
Opportunities for Future Development	Approved landfill capacity extension and resource recovery expansion potential
Landfill Gas	Landfill gas extraction, flaring and electricity generation activities undertaken. Two 1.1 MW generators currently annually generate around 18,000 MWh's of electricity per delivering to the grid the equivalent power needs of around 3200 homes and the abatement of 114,000 tonnes of CO ₂ equivalent.

Woy Woy

Type of Facility	<p>Integrated Waste Management Facility encompassing:</p> <ul style="list-style-type: none"> • Putrescible landfill • Garden organics sorting and transfer • Drop-off facility for recyclables and specific waste types, including e-waste • Sorting and recycling area for scrap metal waste • Materials recovery area for sorting and recovery of concrete, bricks and tiles • Biosolids processing • Waste education centre
Capacity	Licensed to receive 100,000 tonnes per annum
Primary Wastes Accepted (see website for more)	<ul style="list-style-type: none"> • Putrescible waste • Non-putrescible waste • Asbestos • Tyres
Primary Direct Users	Residents and businesses in the southern end of the LGA
Remaining Life	14 years at current disposal rates
Opportunities for Future Development	<ul style="list-style-type: none"> • Development Approval to develop an alternative waste treatment facility on-site with the potential to process up to 115,000 tonnes per annum • Near-term relocation of the garden organics facility • Expansion of the current landfill cell to extend the landfill design by up to 10 years
Landfill Gas	Landfill gas extraction, flaring and electricity generation activities undertaken. A 1.1 MW generator annually generates around 7,200 MWh's of electricity delivering to the grid the equivalent power needs of around 1,200 homes and the abatement of 34,000 tonnes of CO ₂ equivalent

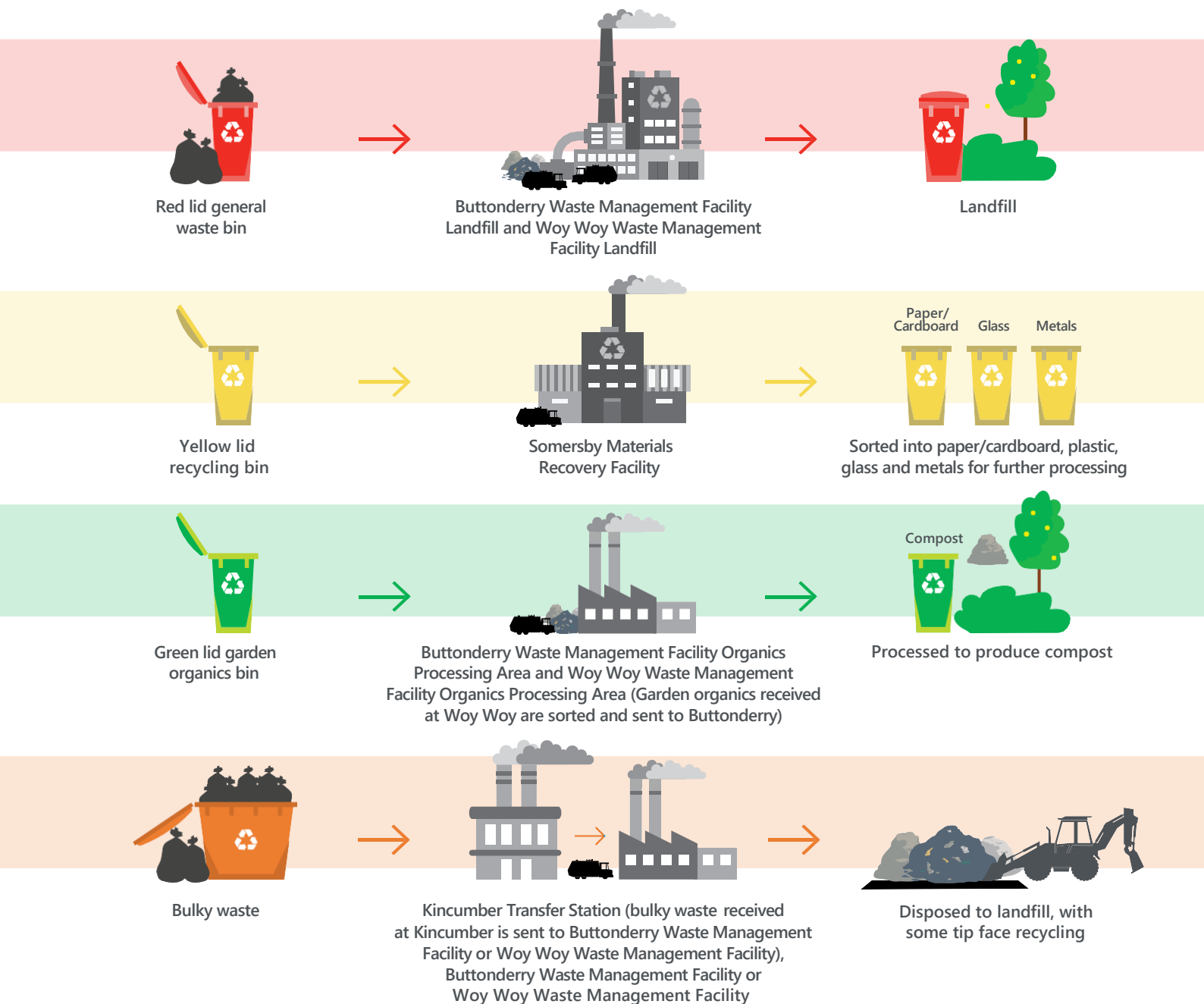




Kincumber

Type of Facility	Transfer Station (public and commercial drop-off). The site also retains contingency landfill airspace and its landfill licence.
Capacity	Licensed to receive 100,000 tonnes per annum
Primary Wastes Accepted (see website for more)	<ul style="list-style-type: none"> • Dry inert waste • Green waste
Primary Direct Users	Residents and businesses in the eastern part of the LGA
Remaining Life	Not applicable for a transfer station. The site has approximately 600,000 m ³ of contingency landfill space.
Opportunities for Future Development	Potential to develop an enclosed facility to process dry waste streams, subject to viable volumes.
Landfill Gas	Landfill gas extraction, flaring and electricity generation activities undertaken. A 1.1 MW generator annually generates around 1,900 MWh's of electricity delivering to the grid the equivalent power needs of around 320 homes and the abatement of 12,000 tonnes of CO ₂ equivalent.

The waste management pathways for household waste.



Waste and recycling performance

Municipal waste flows

Across all household collections on the Central Coast, residents generated 168,243 tonnes of waste in 2018-19, of which 59% (98,511 tonnes) was sent to landfill and 41% (69,732 tonnes) was recovered. Another 106,763 tonnes of drop-off material was received at our three waste facilities.

Total waste generation fluctuated between 2011-12 and 2017-18, with a peak in 2014-15 due to a spike in bulky and garden waste after severe storms caused extensive property damage and tree loss. Residual waste in the red lid general waste bin has remained relatively constant over the last five years while recycling volumes have declined, reducing our overall landfill diversion rate by 3% over the last five years from nearly 44%.

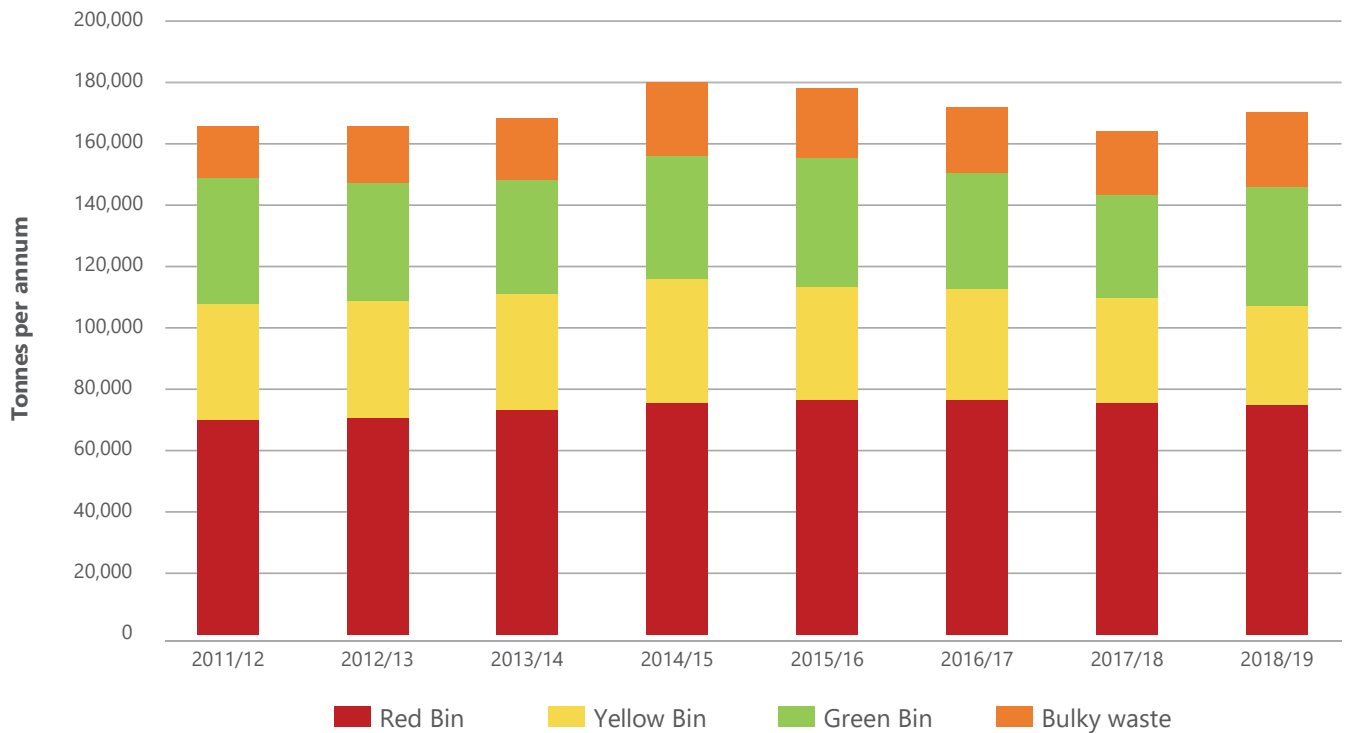


Figure 7 Total waste and recycling collected by Council

To achieve the current state-wide 70% landfill diversion target for municipal waste by 2021-22, the Central Coast will need to recover an additional 48,038 tonnes from the 98,511 tonnes a year that are currently sent to landfill. There are real opportunities to extract value from the red lid general waste bin and to improve recovery from bulky and drop-off waste.

Central Coast households on average generated nearly 20 kg per week of waste and recycling, in addition to 12 bulky waste items per year.

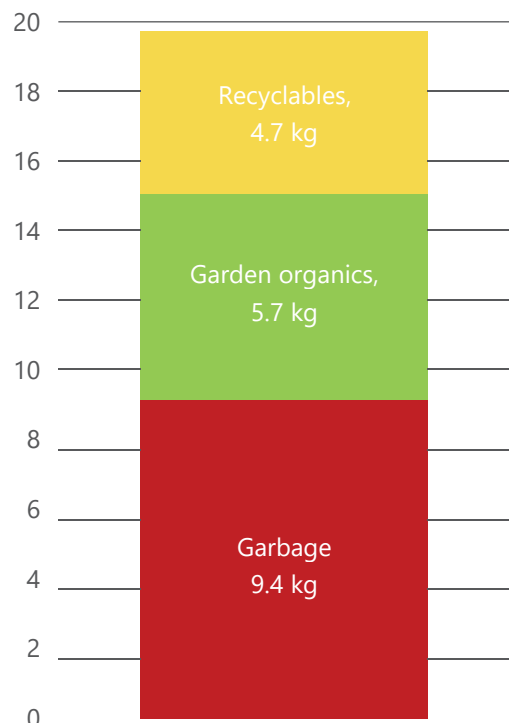


Figure 8: Typical kilograms of kerbside waste per household per week

Household bins

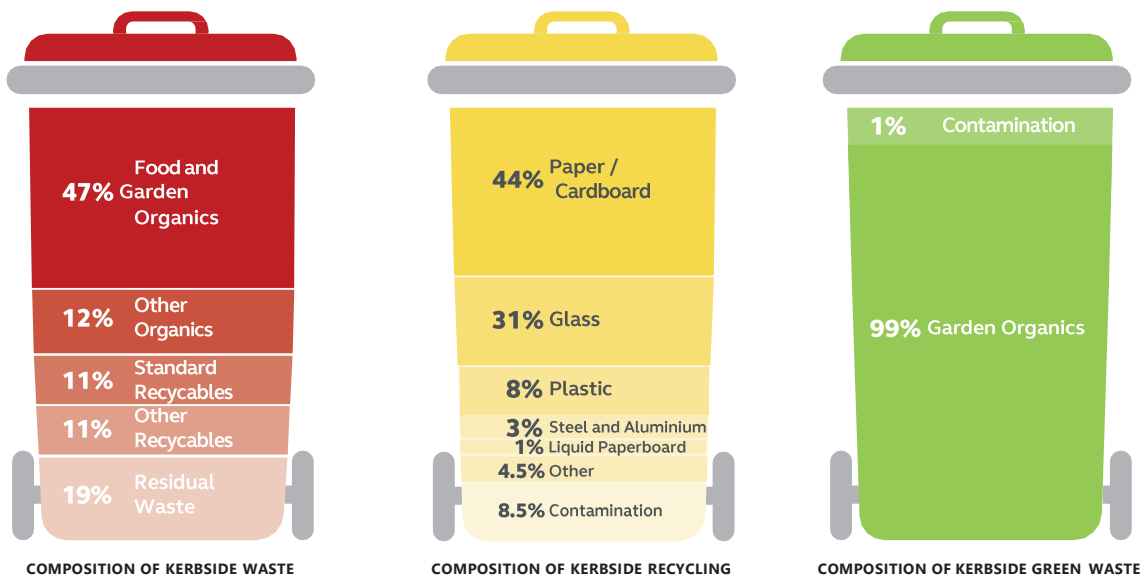


Figure 9: The typical composition of Central Coast red lid general waste bins, yellow lid recycling bins and green lid garden organic bins(2018)

Assessment of the composition of our kerbside waste and recycling streams helps to zero in on opportunities to improve recovery and reduce contamination.

A significant 22% of material in our red lid general waste bins (by weight) was recyclable items that should be captured in yellow lid recycling bins or other existing recycling services.

A further 59% is organic, including food waste and other organic wastes. A variety of alternative waste treatment options could recover some value from this organic fraction, whether through a dedicated collection service or extracted from the mixed waste stream (see Section 4 for more on waste processing technologies).

Altogether, there is potential to recover more than 61,000 tonnes of additional resources from the general waste stream by improving capture rates and expanding waste services (Table 2). Detailed analysis is required to assess the viability of new service options (Section 4).

Table 2: Recovery potential in Central Coast bins.

Material	Items Per Household	Recovery Potential
Standard recyclables	Divert standard recyclables still in our red lid general waste bin into the yellow lid recycling bin.	8,300
Other recyclables	Target soft plastics, expanded polystyrene (EPS) and similar plastics in the red lid general waste bin.	8,300
Food and garden organics	Target food and garden organics in the red lid general waste bin by introducing a FOGO collection.	35,500
Other organics	Target other organics in red bin by sending to a mixed waste AWT processing plant.	9,000
Total		61,100

In terms of the yellow lid recycling bin, 8.5% of its content is contamination, including soiled paper, non-recyclable glass (mixed glass and glass fines), non-recyclable plastic, plastic film and containerised food. While marginally better than the NSW average, contamination with non-recyclable items can lead to rejection of valuable recyclables by the recycler, increasing community costs and reducing our recovery rate. Further education and community support is required to support Council in minimising contamination.

The green lid garden organics bin has low contamination at 1%, with the main contaminants including treated timber, glass containers, food, textiles, ceramics and earth-based materials. Ongoing education will continue to drive contamination performance.



Bulky waste

Household items that are too large or too heavy for regular kerbside bin collection are defined as bulky waste, which is collected through an individually booked service (Section 3.2).

The audit indicated 44% of the items in our bulky waste stream could be reused, equivalent to 5.2 reusable items per pile. The most common items with reuse potential were kitchenware, furniture, carpet, building materials, clothing and toys. It also revealed that 7% of items were not acceptable within bulky waste and should not have been placed on the kerbside for disposal.



Drop-off waste

In addition to kerbside collections, residents and businesses dropped off more than 106,000 tonnes of waste materials in 2018/19. Of this, 13% (13,500 tonnes) was salvaged and sent to recovery, a baseline performance from which Council aims to improve.

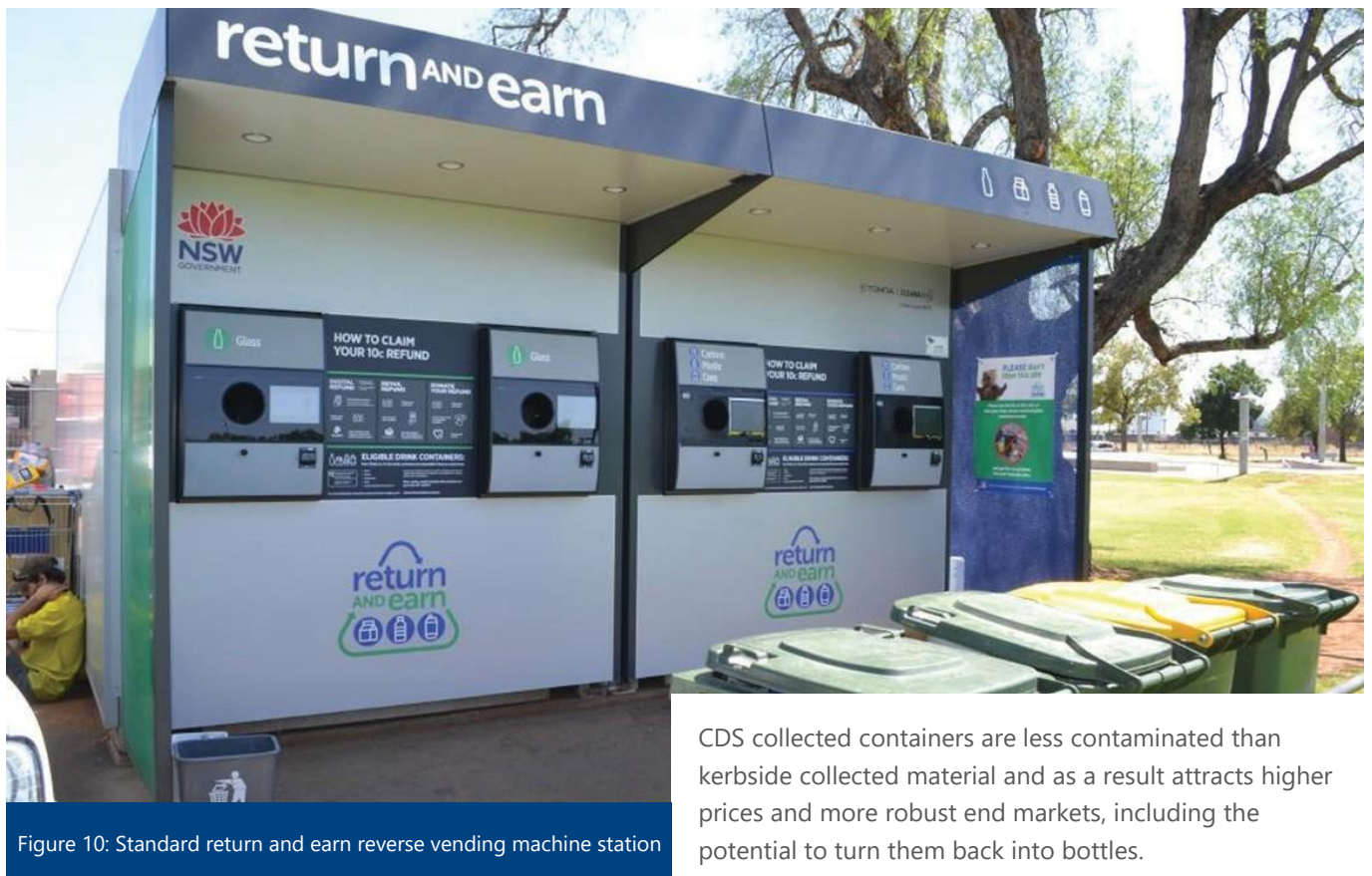


Figure 10: Standard return and earn reverse vending machine station

Container deposit scheme soars

In 2017, the NSW Government introduced a state-wide Container Deposit Scheme (CDS) to reduce littering of beverage containers, which had made up 44% of the volume of litter and cost more than \$162 million a year to manage.

The scheme, which refunds a 10 cent deposit paid on each eligible container returned at an approved collection depot or reverse vending machine (RVM), has been popular across NSW and on the Coast.

There are multiple RVMs and automated depots across the Central Coast, including in Wyong, Tuggerah, Lake Haven, Gosford, Umina, Toukley, Charmhaven and Kincumber. The volume of the commingled recycling stream dropped 25% in 2018, almost certainly due to the impact of the CDS. While a very positive outcome, a perverse impact is the reduction in Council's waste diversion performance by reducing recovery through the kerbside system.

In the first half of 2019, more than 43 million containers were recovered, either returned by Central Coast residents through these facilities or collected in kerbside recycling. This is the second largest number of any local government area in NSW, after Blacktown in Western Sydney.

CDS collected containers are less contaminated than kerbside collected material and as a result attracts higher prices and more robust end markets, including the potential to turn them back into bottles.

Commercial waste flows

Council also provides an essential disposal option for both commercial and industrial (C&I) and construction and demolition (C&D) waste streams in the region.

Commercial waste is generated by more than 22,000 businesses on the Central Coast and disposed at the owner's discretion, with 8,500 tonnes taken to Council-run facilities in 2018-19. Council also collects waste from small businesses as part of the household waste collection run.

Some 13,500 tonnes of C&D waste was delivered by private contractors to the Council waste facilities in 2018-19, of which 99% was landfilled and 1% recovered.

Traditionally, C&I and C&D waste streams have a low recovery rate, presenting opportunities to divert the waste currently deposited at Council facilities and to create an attractive recovery solution for wastes currently disposed outside the LGA. Additionally, large waste generators and transporters outside the Central Coast have expressed interest in utilising Council facilities, which could provide the volumes required to support innovative resource recovery infrastructure.



4 RESOURCE RECOVERY OPPORTUNITIES

Growth in waste generation, the limited remaining life of landfilling at Woy Woy and the community and Council objective to increase resource recovery, drives the need to explore resource recovery opportunities.

Analysis of our waste data clearly indicates that the key opportunity to deliver a step-change in waste outcomes on the Coast is to:

1. Recover value from the red lid general bin waste, which is the largest waste stream and currently goes directly to landfill; and
2. Enhance the bulky waste processes to avoid and divert more waste from landfill.

Recovery options for general waste

The two broad approaches to diverting more material from the red lid general waste bin are some variety of alternative waste treatment (AWT) facility that extracts viable value from mixed waste, or to separate food waste for collection and processing with garden organics.

The primary technology options are:

- Mechanical Biological Treatment: A process that 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 (compost) and/or Refuse Derived Fuel (RDF)

- EfW (Energy from Waste): The primary options are combustion, which burns the carbon-based components of the waste in a purpose-built furnace to generate electricity (and heat), and gasification by burning the waste in a limited oxygen environment so that it is partially oxidised into a combustible synthetic gas (syngas).

- Food Organics and Garden Organics (FOGO): A modification to the current kerbside garden organics service offered east of the M1, by establishing a co-collected food and garden organics service for processing into high value compost.

To understand the costs and diversion rate implications of these options within the Central Coast context, these technologies and their associated collection scenarios have been modelled to provide an indicative assessment of impacts and benefits.

Options

Business as Usual (BAU)

The standard BAU service provided by Council consists of:

- Weekly collection and disposal of a 140L red lid general waste bin
- Fortnightly collection and processing of a 240L yellow lid recycling bin
- Fortnightly collection and processing of a 240L green lid garden organics bin, provided to the eastern area only
- Landfilling at Woy Woy and Buttonderry

Food Organics and Garden Organics Collection and Processing (FOGO)

Introduction of a weekly FOGO service to co-collect food and garden organics, with a fortnightly red lid general waste bin collection, and development of a FOGO processing facility.

Introduction of a weekly FOGO service, with a weekly red lid general waste bin collection, and development of a FOGO processing facility.

A mixed waste processing energy from waste (EfW) facility

Residual waste is directed to an EfW facility that employs conventional combustion (mass burn) of residual waste.

Residual waste is directed to an EfW facility that employs gasification with at least a basic level of pre-treatment.

A mixed waste processing mechanical biological treatment (MBT) facility

Residual waste is directed to an MBT facility, with mixed waste compost as the primary product

Residual waste is directed to an MBT facility producing RDF and compost as products.

Note: All options continue to use a fortnightly 240L yellow lid recycling bin and bulky waste collection

Comparing results

To inform discussion of long-term waste management, the four waste service scenarios were defined and modelled to compare the costs and outcomes that each might deliver. For each option, the cost to Council and diversion rate potential between 2020 and 2045 were compared in net present value terms. There are several models to investigate which include Council either investing Capital to construct required facilities, or seeking a third party contractor to build and operate the facilities.

Business as Usual

Landfill is the most expensive option due to the significant costs associated with the landfill levy. If Council keeps the current services, costs will increase in line with levy increases, with no benefits in terms of improved resource recovery.

FOGO System

The current 10-year collection contract allows Council to establish a FOGO service, with food and garden organics co-collected weekly in the current green lid garden organics bin, with the service rolled out to all residents across the LGA.

FOGO delivers the lowest diversion given it only targets the organic fraction, resulting in landfill diversion rates of between 14-26%. It is the second most costly alternative scenario given collection costs increase and a significant volume is still sent to landfill, where it incurs the waste levy.

In addition, Council will need to determine whether to collect the organics-depleted red lid general waste bin either weekly or fortnightly. FOGO is most successful (high capture, low contamination rate) when the red lid bin is collected fortnightly, however community acceptance may be a challenge.

Mixed Waste to EfW

Another option is to process general waste in some type of alternative waste treatment facility, including at Woy Woy Waste Management Facility or another location. Of these options, energy-from-waste treatment technologies offer the lowest cost per tonne and accept the widest range of wastes, including bulky waste.

Technical diversion rates are 80-90%, although the NSW Energy from Waste Policy sets a 40% limit on the proportion of red bin general waste allowed to go to EfW where a council runs a 3-bin system that includes garden organics (as on the Coast). The modelling has also captured the above FOGO scenario, in which case there is no limit on residual waste to EfW.

Mixed Waste to MBT

MBT for processing mixed waste delivers competitive outcomes compared to EfW scenarios in cost and diversion (55-85%). However, this is dependent on securing a market for the lower grade compost, which is set to be permanently prevented by the EPA from 2020, effectively eliminating this option.

Diversion rates

Table 4 provides the indicative recovery rates of each scenario.

Table 4: Diversion rates under various service scenarios for red-lid general waste and overall domestic waste.

Description	Red Lid General Waste Diversion Rate	Overall Diversion
Business as usual	0%	41%
FOGO with fortnightly red bin	26%	54%
FOGO with weekly red bin	14%	49%
MBT producing compost	55%	67%
MBT producing RDF	85%	81%
EfW Combustion	34%	58%
EfW Combustion - FOGO, fortnightly red	90%	82%
EfW Combustion - FOGO, weekly red	88%	82%
EfW Gasification	32%	57%
EfW Gasification - FOGO, fortnightly red	86%	80%
EfW Gasification - FOGO, weekly red	84%	80%

An aerial photograph of a waste processing facility. The ground is covered with large piles of waste, including plastic, paper, and other debris. Several excavators are visible, working on the waste. One excavator is orange, another is red, and another is yellow. The scene is brightly lit, suggesting a sunny day. The text is overlaid on the right side of the image.

AWT vs FOGO

While the scenario modelling provides some guidance on preferred pathways, other factors need to be considered. For example, thermally-based energy recovery solutions are untested in Australia, MBT-derived compost is currently under regulatory review and MBT to produce a refuse derived fuel (RDF) is challenging in terms of local applications for the fuel.

Each approach has advantages and disadvantages. The key issues have been captured over, but detailed analysis and market testing with the waste industry is required to make a final determination of the preferred options.

	Advantages	Disadvantages
Business as Usual	No change to existing household waste practices.	Costs will increase over time due to the rising cost of landfill, including the landfill levy
	A proven service with high community acceptance	No improvement in resource recovery
		Maintains different services provided east and west of the M1
FOGO (Food and Garden Organics)	Leverages the existing garden organics bin and collection service (for those east of the M1)	Separated food waste can be contaminated by plastics from packaging, kitchen caddy liners and other plastics
	The concept of closing the loop on organics back into soil fertility is powerful and easy to understand	Average capture rates of food (into the FOGO bin) are currently only 35% among NSW councils, reducing diversion from landfill
	Targets food waste within the general waste bin, which is the largest single fraction (14-26%) and generates greenhouse gas and liquid leachate in landfill	High impact on the garden organics stream, with higher collection costs and contamination rates from the merged service
	Creates nutrient-rich compost, which expands the range of end use options and increases revenue	Higher overall costs, especially if general waste service remains weekly
	Extracting the primary degradable waste type from the red lid bin service allows consideration of switching to fortnightly general waste collection to reduce service costs	Potential for high community sensitivity if the general waste service is reduced in frequency
	Mature, low risk technology	
Mechanical Biological Treatment (MBT)	No change to household waste practices as it uses the current collection system	MBT composted product is lower quality due to contamination from the red lid bin materials
	Can be provided to all residents equally (east and west of the M1) without change	Recent regulatory changes have effectively eliminated the end markets for MBT composted product, resulting in uncertainty about overall viability
	Achieves a medium recovery rate (40-85%) by targeting all recyclable materials in the general waste bin, including compostable organics and conventional recyclables incorrectly disposed	The end market for the alternative refuse derived fuel (RDF) product is not mature
	Protects clean, low-cost garden organics compost by avoiding contamination with plastics from FOGO	
	There are existing facilities	
	Relatively low cost due to avoidance of the landfill levy	
	Mature, low risk technology	
Energy from Waste	No change to household waste practices as it uses the current collection system	High community and regulator sensitivity, particularly around air emissions
	Can be provided to all residents equally (east and west of the M1) without change	Not proven in Australia
	Achieves a high recovery rate (up to 90%) by targeting all material with energy value in the general waste bin	May require partnering with other councils to achieve minimum tonnes for viability
	Protects clean, low-cost garden organics compost by avoiding contamination with plastics from FOGO	Potential for longer approval and development timeframes
	Could work in tandem with a FOGO system, processing only the non-organic residual waste	
	Relatively low cost due to avoidance of the landfill levy	
	Combustion is a mature technology globally; gasification is less mature	



Bulky waste resource recovery

Nearly 25,000 tonnes of bulky waste was generated in 2018/19. With a recovery rate of 17% (4,300 tonnes), there is significant scope to improve performance. The Strategy has identified a range of options to lift the bar, including:

- A tip shop, hire shop and / or repair shop to give new life to unwanted products
- Repair workshops
- Education
- Provide alternative collection options for specific items, such as electronics, to divert such waste streams from kerbside collections
- Explore additional recycling avenues and then energy from waste.

Any configuration of these options could be combined to amplify diversion performance.

5 THE ACTION PLAN

KEY OBJECTIVES AND ACTIONS

OBJECTIVES

ACTIONS

01.

Drive waste avoidance

- 1.1** Enhance community awareness and action around waste avoidance and reuse through targeted education campaigns
- 1.2** Engage local businesses to support uptake of opportunities for avoidance of waste and increased recycling
- 1.3** Identify avoidable Council waste streams and improve waste management behaviours
- 1.4** Enhance the sustainability focus in Council procurement to close the local loop

02.

Deliver a step change in diversion from landfill and build a circular economy

- 2.1** Investigate and plan for a large-scale waste processing solution for FOGO
- 2.2** Explore the viability of an integrated resource recovery precinct(s) to maximise recovery of resources from a wide range of local waste streams
- 2.3** Assess targeted recovery options for a broader range of household items, including salvage from kerbside collection and waste dropped off at landfills, and the viability of a resale or hire shop
- 2.4** Optimise existing waste management facilities to better sort, extract and recycle dry wastes
- 2.5** Improve and expand community recycling practices through education and promotion
- 2.6** Facilitate and utilise local end markets for recycled products and materials

03.

Strengthen triple bottom line outcomes

- 3.1** Collaborate with social enterprises and not-for-profit groups in mutually beneficial partnerships
- 3.2** Develop an ongoing dialogue with the community, business and other stakeholders with regards to waste management
- 3.3** Work with other levels of government, stakeholders and NGOs, to advocate for policies and programs that support Council's waste strategy
- 3.4** Continue to optimise waste facilities and services through delivery of efficient and cost-reflective operations

04.

Enhance street and open space appeal

- 4.1** Improve public place waste and recycling services
- 4.2** Explore smart city technology to enhance waste processes
- 4.3** Audit kerbside bins, bulky waste and public place bins to target opportunities to improve recovery
- 4.4** Review best practice bulky waste collection services, including service delivery and education
- 4.5** Review best practice waste storage design and service delivery for residential development, commercial / industrial development and subdivisions



OBJECTIVE 1 – DRIVE WASTE AVOIDANCE

The Central Coast community is environmentally conscious and aware of waste management issues. Almost 90% of those who participated in the survey said that it is very important to reduce the amount of waste that households generate and landfill.

A convenience lifestyle and 'throw-away' mindset has led to an increasing volume of unnecessary, single-use waste. Some common materials that make up a large proportion of avoidable waste are coffee cups, plastic bags, plastic foodware, single portion packets (e.g. sugar) and junk mail.

Our first priority is to drive a higher level of waste avoidance. This aligns with the Waste Hierarchy as avoiding waste in the first instance addresses the life cycle impacts of consumption, from supply chain to end of life.

Where product consumption cannot be avoided, Council and the community should explore reusable options and consider repurposing materials. Council intends to lead by example by addressing its own single use footprint, such as reviewing single use items at Council run events, and work with other stakeholders to help them embrace a similar change.



“Together, we can move away from being a society of convenience and begin to create a culture of reuse”



KEY ACTIONS

1.1 Enhance community awareness and action around waste avoidance and reuse through targeted education campaigns

Council will promote waste avoidance through multiple avenues, including online campaigns, community groups and direct messages to household and businesses. Online initiatives will include leveraging the existing online footprint, including more than 35,500 'likes' of the Council Facebook page and 7,000 followers of the Instagram account. Community outreach will target community and church groups, sports clubs, aged care residences, industry groups and the like.

1.1.1 Develop and deliver waste avoidance education campaigns with residents and businesses to support behavioural change.

1.1.2 Target education in schools to reach the region's 29,200 primary school students and 24,130 secondary school students, establishing long-term behaviours and recognising the influence of our younger residents in transferring knowledge and facilitating change.

1.1.3 Promote the reuse, repair, repurposing of household items.

1.2 Engage local businesses to support uptake of opportunities for avoidance of waste and increased recycling

Council will work with local businesses including key waste generators and influencers within the community to encourage them to identify, support and implement waste reduction, as well as establishing a local focus on waste solutions.

1.2.1 Engage with large waste generators, such as the fast food, supermarket and health care industries, to keep them accountable and encourage them to minimise waste that can be avoided, in particular the generation of unnecessary waste streams.

1.2.2 Work with smaller businesses to help identify collective waste solutions and consider opportunities to leverage the work of bigger businesses.

1.2.3 Identify particular problematic and unnecessary waste streams and work with the industry to identify alternative products and materials.

1.2.4 Encourage and support, where appropriate, local businesses in undertaking waste audits, as an ongoing activity, to identify waste reduction opportunities and continuous improvement.

KEY ACTIONS

1.3 Identify avoidable Council waste streams and improve waste management behaviours

Council has committed to assessing the waste streams generated through its day-to-day activities and the practices that drive that waste, to identify opportunities to avoid waste. This will reduce Council's lifecycle impact, reduce waste generation on the Central Coast, support local solution providers and build capacity around waste wise behaviours and promote that to the community. Council will enforce its event waste policy across all Council-run events to avoid waste, where possible, and maximise the diversion of unavoidable waste.

1.3.1 Undertake a 12 month program of waste audits in Council buildings to establish a baseline understanding of the streams that are potentially avoidable. The portfolio of buildings is likely to encompass libraries, childcare centres, depots and administration buildings.

1.3.2 Prioritise waste avoidance within Council buildings, projects and Council-run events, where possible, by identifying key internal stakeholders and solutions that improve waste practices and support a circular economy. Key departments within Council will be engaged to identify and implement solutions tailored to their individual operating context, barriers, scale, material inputs and waste outputs.

1.3.3 Where Council waste cannot be avoided, explore local solutions that support reuse, repair and recycling.

1.3.4 Council will lead by example to advocate for sustainable events. Where Council has control or influence over waste-generating aspects, such as use of single-use plastics, it will promote avoidance.

1.3.5 Improve event waste management infrastructure e.g. wash up stations and cup exchanges.

1.4 Enhance the sustainability focus in Council procurement to close the local loop

Sustainability is already a criterion in the Council procurement policy. Council will work across departments to raise the profile of sustainable procurement opportunities within its own operations and projects.

1.4.1 Enhance implementation of the sustainability assessment in the existing procurement policy within Council.

1.4.2 Promote and preference (where viable) local recyclers, reprocessors and end users when managing Council-generated waste.

OBJECTIVE 2 – DELIVER A STEP CHANGE IN DIVERSION FROM LANDFILL AND BUILD A CIRCULAR ECONOMY

With 59% of our kerbside waste sent to landfill in 2018-19, increased diversion to higher value outcomes is a critical step in reducing the waste footprint of the Central Coast community.

The community consultation demonstrated a high level of interest in diverting waste from landfill, including a willingness to pay more for processing of red bin waste and, among other things, to drop-off household items at a resale shop to be given another useful life.

Council need to operate at varying scales, from major infrastructure through to targeted solutions to divert and recover value from key streams going to landfill. A key barrier to resource recovery is finding viable end markets for the recycled products or materials.

Increasing local demand for recovered materials will not only support a sustainable circular economy but generate flow-on effects such as new jobs and stimulate development of innovative solutions.



KEY ACTIONS

2.1 Investigate and plan for a large-scale waste processing solution for FOGO

Processing of red bin general waste is the biggest opportunity to deliver a step change in the Central Coast landfill diversion rate. While Council will prioritise initiatives higher in the waste hierarchy, such as improved waste behaviours and investigating recycling solutions for specific streams, there will always be a significant volume of waste that cannot be conventionally recycled back into new materials.

2.1.1 Council will investigate waste technology options, and the associated collection requirements, that can deliver safe, secure and cost-effective processing of FOGO into beneficial use.

2.1.2 Council will investigate the suitability of Council-owned facilities for potential development of a FOGO waste processing facility, noting that other sites both inside and outside the LGA may also offer value.

2.2 Explore the viability of an integrated resource recovery precinct(s) to maximise recovery of resources from a wide range of local waste streams

Another option to increase recycling is through an integrated, one-stop recycling park or precinct(s) to expand the suite of recycling services on the Central Coast.

2.2.1 Co-locating recycling and reprocessing facilities for different material types in a recycling park, or in clusters of facilities, may create synergies that increase viability and expand the range of services on offer. Consider the potential to develop an integrated resource recovery park at an existing Council waste facility to take advantage of its existing use, or the merits of facilitating development of a strategically located industrial estate(s).

2.2.2 Investigate drop-off solutions for problem household wastes such as chemicals, light globes, batteries and mobile phones.

2.3 Assess targeted recovery options for a broader range of household items, including salvage from kerbside collection and the viability of a resale or hire shop

There is a high level of community support for an outlet to resell or hire out second-hand goods in order to provide another life for valuable products and reduce demand for new products, together with their associated supply chain impacts. In addition to drop-off at a second hand goods shop, there is considerable recyclable material in kerbside bulky waste that could be salvaged for recovery. While some recovery already occurs when loads are tipped at the landfill, this is less efficient and has a greater likelihood of contamination.

2.3.1 Investigate the viability of establishing a second hand goods shop, such as a tip shop at one of the Council waste facilities, to accept items in good condition that can be resold. This may include a repair room to undertake minor repairs, and potentially conduct education workshops to engage and re-skill the community in repairs.

2.3.2 Consider introducing a bookable pick-up service to collect reusable products, in tandem with any reuse shop.

2.3.3 Trial a service to recover recyclable materials from kerbside bulky waste before it is collected, focusing on traditional recyclables rather than items that can be repurposed at a tip shop (e.g. furniture). The standard collection run would be preceded by a dedicated recovery run to separate cardboard, metals and other recyclable materials.

2.3.4 Consider viable options to ban specific products from disposal via bulky waste collection where they can be managed in a more sustainable manner, such as e-waste and suitable recoverable resources.

2.4 Optimise existing waste management facilities to better sort, extract and recycle various dry wastes

With significant volumes of waste dropped off at Council facilities and high value components in the bulky waste stream, recovery of dry wastes represents a key opportunity as it is easier to sort and less likely to be soiled.

2.4.1 Investigate equipment, infrastructure and resources required at Council's waste management facilities to increase resource recovery of dry wastes including domestic kerbside and self-hauled wastes, Commercial & Industrial (C&I) waste and Construction and Demolition (C&D) waste.

2.5 Improve and expand community recycling practices through education

Council has one of the largest collection contracts in Australia and has the potential to reach a broad range of people to educate them to correctly use waste management services.

2.5.1 Educate community on source-separation and move towards a standardised approach to ensure a level of understanding is maintained throughout the region.

2.5.2 Investigate how to decrease contamination in kerbside bins through ongoing audits and using the data to determine what materials should be targeted in education campaigns.

2.5.3 Provide all residents with educational materials on existing Council services, including kerbside collection, bulky waste pick-up and waste management facilities to improve resource recovery and reduce contamination rates.

2.5.4 Maintain a clear understanding of the challenges in Multi-Unit Dwellings (MUDs) to increase participation in correct waste management and therefore improving waste behaviours

2.6 Facilitate and utilise local end markets for recycled products and materials

Investment in recycling infrastructure requires end market applications for the recovered materials to create market demand, underpinning both materials flow and the economics of recycling. End markets on the Central Coast, where sensible, foster a local circular economy that supports local businesses, reduces transport costs and boosts resilience.

2.6.1 Council will look to support viable local end markets for recycled materials by exploring procurement of locally recycled products for use in local amenities, such as in playgrounds, benches and roads.

2.6.2 Council will support and facilitate trials of local applications for products and materials, particularly those managed or generated by Council, to encourage innovation in local recycling, reprocessing and reuse.

2.6.3 Work with and support local businesses to develop local markets for recovered materials and in turn, consider developing initiatives to attract new business to the region.



Constructing roads from plastic bags and recycled glass

In 2019, Council produced an alternative road surfacing material made from processed soft plastics such as shopping bags and chip wrappers, crushed glass and waste toner from printer cartridges.

Every kilometre of two-lane road made from recycled materials contains the following waste products:

- 530,000 plastic bags
- 168,000 glass bottles
- 12,500 cartridges worth of waste toner.

Rather than sending these materials to landfill or long term stockpiling (in the case of glass), these waste products are added to bitumen. Results have shown that the alternative road surfacing product has the strength and resistance to deformation that is equal or superior to traditional asphalt, which improves its longevity and capacity to handle heavy vehicle traffic.

Figure 12: First road being laid in the Central Coast comprised of soft plastics

Council's first major projects to be delivered using this alternative product were:

- Wards Hill Road, Empire Bay – to stabilise and seal a 260 metre section of road
- Boomerang Road, Long Jetty – installation of a cul-de-sac road and road upgrade

Due to the success of this product, Council is keen to expand the collection of these wastes. Given 75% of surveyed residents said they would drop off soft plastics to a convenient collection point, Council support for an innovative application on the Central Coast could help close the loop on a recognised problem waste stream.



OBJECTIVE 3 – STRENGTHEN TRIPLE BOTTOM LINE OUTCOMES

Solutions are strengthened when developed and delivered by multiple parties, bringing high levels of commitment and participation. Council also recognises that recycling and reuse projects offer opportunities for local engagement, delivering economic and social benefits while continuing to act as a steward for the environment.

Empowering the community to drive waste avoidance and improve diversion will enhance the effectiveness of Council initiatives.

Council is committed to working with stakeholders within and outside of Council, including the formation of mutually beneficial partnerships, to achieve triple bottom line outcomes. The actions under this objective focus on strengthening relationships with stakeholders to improve efficiencies and to benefit all parties involved.

“To create a vibrant, inclusive and sustainable community, we must encourage innovation and value individual forms of creativity”

KEY ACTIONS

3.1 Collaborate with social enterprises and not-for-profit groups in mutually beneficial partnerships

Social enterprises have long been involved in the resource recovery sector, improving recovery rates while providing a pathway to engage people with a disability or long-term disadvantage in meaningful work. Council will seek to facilitate this win-win scenario. Council will also explore programs developed by environment and community groups to engage business and the community in waste reduction behaviours.

3.1.1 Consider opportunities to work with social enterprises such as disability groups, correctional centres and women / men's shed groups to recover resources from targeted waste streams and create local jobs and wellbeing.

3.1.2 Explore opportunities to partner with interest groups to encourage community engagement, such as the Plastic Free Places program, Take 3 for the Sea, community gardens and other groups.

3.1.3 Engage and support local community groups to implement programs and campaigns that align with this Waste Strategy.

3.2 Develop an ongoing dialogue with the community, businesses and other stakeholders with regards to waste management

The strong community response to the consultation (Section 2.2) highlights an appetite for an ongoing dialogue around waste management practices and processes. Council will continue to engage with the community around the broad agenda of waste and resource management.

3.2.1 Support community-based sustainability and circular economy initiatives that are in line with this Strategy.

3.2.2 Continue community engagement to assess and enhance waste awareness, behavioral patterns and satisfaction with Council's direction.

3.2.3 Capture the required data to report on internally and also to the community, to demonstrate how the targets have been met and to promote transparency.

3.3 Work with other levels of government to advocate for policies and programs that support Council's waste strategy

Council will work with other levels of government, key waste generators and influencers within the community to encourage them to identify, support and implement waste reduction, as well as establishing a local focus on waste solutions.

3.3.1 Advocate for the Commonwealth and NSW government to develop policies and programs that support this Strategy.



3.4 Continue to optimise waste facilities and services through delivery of efficient and cost-reflective operations

Council will continue to focus on efficient operations of waste management facilities, services and new opportunities in order to reduce costs and optimise ratepayer value.

3.4.1 Council will continue to pursue best practice, operational efficiencies and regulatory compliance at all waste facilities.

3.4.2 Council is committed to ensuring that future initiatives achieve value for money and take into consideration the triple bottom line outcomes of all decisions and actively seek grant funding opportunities.

3.4.3 Raise awareness and promote existing initiatives such as the Container Deposit Scheme (CDS).

3.4.4 Consider reviews in current pricing models for waste management facilities and in rates, taking into consideration dwelling type (e.g. SUDs vs MUDs)



OBJECTIVE 4 – ENHANCE STREET AND OPEN SPACE APPEAL

Waste management is an essential service that, at its core, is designed to support neighbourhoods that are healthy, safe and attractive. Council are adding smart technology and a focus on public places to shape and improve the experience of waste management for the local community.

This includes maintaining clean streetscapes that foster pride and encourage inclusive behaviours. Council also aim to optimise the servicing of public place bins and bulky waste and improve convenience to support resource recovery.

New solutions will emerge as technology and practices evolve. Council aims to lead by being open to new solutions through active review and trials of smart city technologies, supported by a detailed understanding of the waste context, challenges and opportunities on the Central Coast.

KEY ACTIONS

4.1 Enhance public place waste and recycling services

Council will investigate ways to improve the capacity and convenience of public place waste and recycling bins through enhancing public waste infrastructure, to increase diversion of public waste from landfill.

4.1.1 Increase the number of public place recycling bins to increase capture rates.

4.1.2 Strategically reconfigure the current network and location of public place waste and recycling bins, where appropriate, to increase capture rates.

4.2 Explore smart city technology to enhance waste processes

As part of a broader commitment to exploring smart city technologies, Council will assess the potential application of relevant technologies across all its waste practices, installing them where and when they offer the greatest value and effectiveness.

4.2.1 Evaluate the current trial of smart sensors monitoring the capacity of conventional public place bins for consideration of further roll-out.

4.2.2 Pilot the use of solar-powered public place bins to reduce the frequency, cost and amenity impact of collection.

4.2.3 Consider the suitability of other smart technologies and models as they emerge, including benefits, barriers, risks and community appetite.

4.2.4 Develop an open access digital platform to collect, verify and publish waste and recycling data in real time.

4.3 Audit kerbside bins, bulky waste and public place bins to target opportunities to improve recovery

Household 'wheelie' bins and public waste bins are essential features of waste services in modern society. Along with the rest of the waste system, this collection infrastructure needs to be optimised to meet the needs of the Central Coast community. Bulky waste is collected from each household on a scheduled basis, six times per year. While the value of the service is recognised by Council and the community, there is an opportunity to assess its efficiency and effectiveness in maintaining street appeal and supporting recovery.

4.3.1 Audit the composition of the kerbside and public waste bins to identify opportunities to improve service delivery and recycling and implement the opportunities as determined.

4.3.2 Ongoing review of the public place bin network to maintain an effective and adequate network and service that reduces litter across the council area, particularly in high traffic areas and litter hot spots such as parks and beaches.

4.3.3 Audit the composition of the bulky waste stream to identify opportunities to improve service and recycling performance.

4.3.4 Where relevant, consider collection/recovery options to optimise servicing and recycling of kerbside bulky waste.

KEY ACTIONS

4.4 Review best practice bulky waste collection services, including service delivery and education

Council will actively promote information sharing and feedback from various sources, including; other local councils, industry and the community, in order to deliver best practice bulky waste collection services.

4.4.1 Review collection servicing options around bulk waste at the kerbside to identify opportunities to move towards best practice

4.4.2 Consider drop-off events and locations for specific household products (e.g. e-waste and mattresses).

4.4.3 An education campaign, including targeted information around problem locations and for tenants (through real estate agents).

4.5 Review best practice waste storage design and service delivery for residential development, commercial / industrial development and subdivisions

Delivery of waste services in an increasingly urbanised community requires active influence over the design of waste storage and collection in new buildings to protect streetscapes, ensure safety, optimise recycling and minimise waste to landfill.

4.5.1 Council will finalise and implement a new Development Control Plan (DCP) and associated Waste Control Guidelines for new buildings to support Council's ability to mandate and monitor the design and development of new buildings.



Smarter litter bins

Council has rolled out new generation public place waste and recycling bins which will use compaction and networked technology to deliver an optimised collection solution.

Big Belly bins are fitted with compaction technology that condenses the waste they receive down to 20% of its original volume, on average. The integrated solar cell on the top side of the bin powers the compaction equipment, as well as sensors that signal when the bin is 85% full and ready for collection. The bins will deliver a significant pay-off in terms of reduced collection frequency.

Council are also pursuing a sensor-based public place bin network, with the intent to retrofit 20 conventional public place bins with sensors that send alerts when the bin requires emptying.

This initiative contributes to the achievement of Action 4.2, expanding smart city technology to enhance waste processes.

6 IMPLEMENTATION PLAN

Action	1-3 years	4-6 years	7-10 years
1 Drive waste avoidance			
1.1 Enhance community awareness and action around waste avoidance and reuse through targeted education campaigns	Plan/Implement	Maintain	Maintain
1.2 Engage local businesses to support uptake of opportunities for avoidance of waste and increased recycling	Plan/Implement	Maintain	Maintain
1.3 Identify avoidable Council waste streams and improve waste behaviours, including at Council run events	Investigate	Potential timeframe to implement if investigation is positive	Potential timeframe to implement if investigation is positive
1.4 Enhance the sustainability focus in Council procurement to close the local loop	Plan/Implement	Maintain	Maintain
2 Deliver a step change in diversion from landfill and build a circular economy			
2.1 Investigate and plan for a large-scale waste processing solution for FOGO	Investigate	Potential timeframe to implement if investigation is positive	Potential timeframe to implement if investigation is positive
2.2 Explore the viability of an integrated Regional Resource Recovery Park to maximise recovery of resources from a wide range of local waste streams	Investigate	Potential timeframe to implement if investigation is positive	Potential timeframe to implement if investigation is positive
2.3 Investigate opportunities at Council waste management facilities to increase recovery of dry wastes	Plan/Implement	Maintain	Maintain
2.4 Assess targeted recovery options for a broader range of household items, including salvage from kerbside collection and the viability of a resale or hire shop	Investigate	Potential timeframe to implement if investigation is positive	Maintain
2.5 Improve and expand community recycling practices through education	Plan/Implement	Maintain	Maintain
2.6 Facilitate and utilise local end markets for recycled products and materials	Plan/Implement	Maintain	Maintain
3 Strengthen triple bottom line outcomes			
3.1 Collaborate with social enterprises and not-for-profit groups in mutually beneficial partnerships	Investigate	Potential timeframe to implement if investigation is positive	Maintain
3.2 Develop an ongoing dialogue with the community, business and other stakeholders with regards to waste management	Plan/Implement	Maintain	Maintain
3.3 Work with other levels of government to advocate for policies and programs that support Council's waste strategy	Plan/Implement	Maintain	Maintain
3.4 Continue to optimise waste facilities and services through delivery of efficient and cost-reflective operations	Plan/Implement	Maintain	Maintain
4 Enhance street and open space appeal			
4.1 Enhance public place waste and recycling services	Investigate	Potential timeframe to implement if investigation is positive	Maintain
4.2 Explore smart city technology to enhance waste processes	Investigate	Potential timeframe to implement if investigation is positive	Maintain
4.3 Audit kerbside bins, bulky waste and public place bins to target opportunities to improve recovery	Plan/Implement	Maintain	Maintain
4.4 Review collection servicing options around bulk waste at the kerbside to identify opportunities to move towards best practice	Investigate	Potential timeframe to implement if investigation is positive	Maintain
4.5 Use the Development Control Plan (DCP) and associated WasteControl Guidelines for all developments	Plan/Implement	Maintain	Maintain

■ Plan/Implement
 ■ Investigate
 ■ Potential timeframe to implement if investigation is positive
 ■ Maintain

7 WHAT DOES SUCCESS LOOK LIKE?

Vision

Promote the Central Coast as a creative environment for developing a local circular economy that values the recovery of resources and advocates prevention of waste.

Priorities

- Reduce the waste generated on the Central Coast
- Reduce the waste landfilled on the Central Coast
- Increase recycling options available on the Central Coast
- Explore funding opportunities to assist with achieving waste avoidance and diversion.

The Central Coast Resource Recovery Strategy sets a 10-year direction for the Central Coast in optimising resource use and recovery, evolving our waste facilities, managing our residual waste and continuing to facilitate a clean and healthy environment. This is captured in the Strategy's overarching vision:

Promote the Central Coast as a creative environment for developing a local circular economy that values the recovery of resources and advocates prevention of waste

Over the life of the Strategy, we strive to deliver the following achievements:

- Clean culture – Residents, businesses and Council eliminate the concept of waste by recognising that products and materials are valuable resources by making conscious choices about their consumption, use, recovery and end-of-life treatment
- Sustainable services – Our waste management facilities and services are fit for purpose in terms of service offerings, recovery performance, cost, longevity and overall satisfaction
- Recycling revolution – Opportunities to reuse products and recycle materials are maximised, including development of facilities and end markets on the Central Coast that build local industry and support the resilience of Australian recycling
- Red bin recovery – We have secured a solution to divert a significant portion of red lid general waste from landfill to higher value use
- Liveable lifestyle – The Central Coast retains its status as a healthy, attractive and liveable region.
- Active leadership – Council will continue to monitor, pursue and advocate for best practice in waste and resource management.

To track the progress against these objectives and the specific goals of the Waste Strategy, Council will release a report each year.

8 ONLINE RESOURCES

Local initiatives and services

- Local waste and recycling service information - www.centralcoast.nsw.gov.au/residents/waste-and-recycling and <https://1coast.com.au/>
- Our Coast, Our Waste - www.yourvoiceourcoast.com/our-coast-our-waste
- Council operated waste facilities in the LGA - www.centralcoast.nsw.gov.au/residents/waste-and-recycling/find-waste-facility
- Return and Earn (container deposit scheme) - <https://returnandearn.org.au/return-points/>
- The Hunter / Central Coast Waste Avoidance and Resource Recovery Strategy 2017-21 - www.hccrems.com.au/product/2017-hunter-central-coast-waste-avoidance-resource-recovery-strategy-2017-21/

State initiatives and programs

- Love Food Hate Waste program - www.lovefoodhatewaste.nsw.gov.au
- Sustainable events - www.lgnsw.org.au/events-training/event-sustainability
- NSW EPA BinTrim program (for business audits) - www.epa.nsw.gov.au/your-environment/recycling-and-reuse/business-government-recycling/bin-trim
- NSW OEH Sustainability Advantage program - www.environment.nsw.gov.au/sustainabilityadvantage/
- NSW EPA Circulate industrial ecology program - www.epa.nsw.gov.au/your-environment/recycling-and-reuse/business-government-recycling/circulate-business

National initiatives and services

- Recycling Near You - <https://recyclingnearyou.com.au/>
- Planet Ark business recycling tool – <https://businessrecycling.com.au/>
- Plastic free July - www.plasticfreejuly.org/
- Buy Nothing New Month - www.buynothingnew.com.au/
- Garage Sale Trail - www.garagesaletrail.com.au/
- War on Waste television series - www.abc.net.au/tv/programs/war-on-waste/
- Take 3 for the Sea - www.take3.org/
- Plastic Free Places - <https://www.plasticfreeplaces.org/>

Litter and illegal dumping

- RIDOnline (Report Illegal Dumping) - <https://ridonline.epa.nsw.gov.au/#/home>
- Keep Australia Beautiful NSW - www.kabnsw.org.au/
- Clean Up Australia Day - www.cleanup.org.au/

Education

- Getting started with Sustainability in schools - sustainabilityinschools.edu.au/
- Sustainable schools NSW - www.sustainableschoolsnsw.org.au/
- Cool Australia learning resources - www.coolaustralia.org/
- Schools Recycle Right challenge - <https://schoolsrecycle.planetark.org/>
- 'Waste Not' film and educational tools (for schools and adult education) - www.wastenot.org.au/

Circular economy

- Ellen MacArthur circular economy foundation - www.ellenmacarthurfoundation.org/
- European Union 2018 circular economy package - <http://ec.europa.eu/environment/circular-economy/>
- NSW EPA Circular Economy discussion paper - www.epa.nsw.gov.au/publications/recyclereuse/18p1061-too-good-to-waste-circular-economy-discussion-paper





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