REGIONAL WASTE & RESOURCE RECOVERY PLAN

Wide Bay-Burnett Region

Prepared for:

Local Government Association of Queensland
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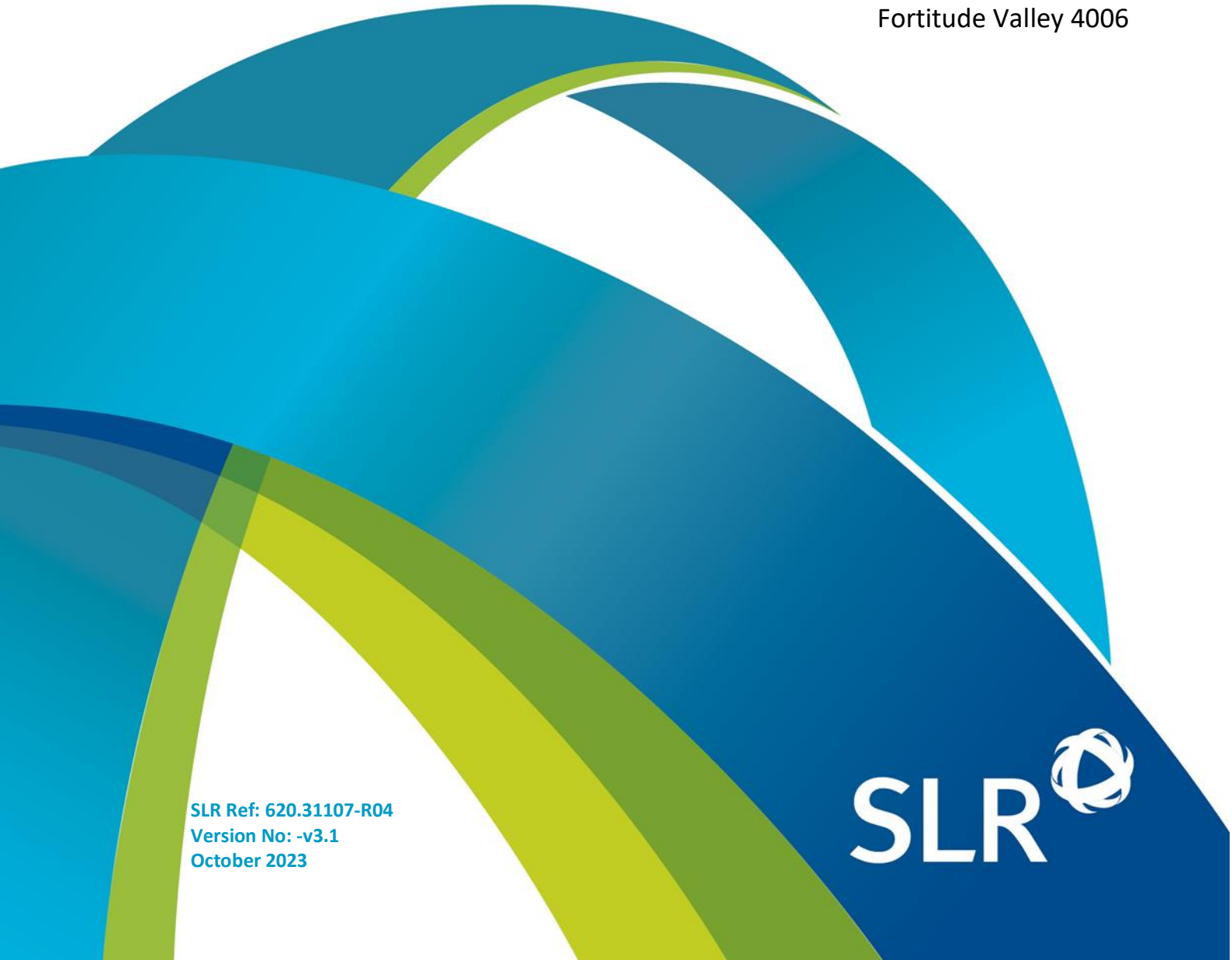

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BASIS OF REPORT

This report has been prepared by SLR Consulting Australia Pty Ltd (SLR) with all reasonable skill, care and diligence, and taking account of the timescale and resources allocated to it by agreement with Local Government Association of Queensland (the Client). Information reported herein is based on the interpretation of data collected, which has been accepted in good faith as being accurate and valid.

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DOCUMENT CONTROL

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620.31107.R04-v3.1	10 October 2023	Chris Hambling	Chani Lokuge	Chani Lokuge
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EXECUTIVE SUMMARY

The Wide Bay-Burnett Regional Waste and Resource Recovery Plan

This Plan identifies a series of actions to be taken at a regional scale and for individual Councils to improve waste and resource recovery outcomes in the Wide Bay-Burnett (WBB) region. Participating Councils are Bundaberg Regional Council, Cherbourg Aboriginal Shire Council, Fraser Coast Regional Council, Gympie Regional Council, North Burnett Regional Council and South Burnett Regional Council.

Under a working group established by councils, a series of workshops and interviews were undertaken to initially define current challenges and opportunities, to identify, refine and select preferred options, and to identify a pathway for implementation. Whilst this Plan sets the forward trajectory to improve waste and resource recovery outcomes in the WBB region, nothing in this Plan mandates Councils must deliver the actions identified in the Plan.

The Plan sets out a non-statutory, aspirational, long-term and co-ordinated path for action and collaboration across councils, to support the planning for and investment in waste and resource recovery infrastructure and non-infrastructure solutions in the region. It recognises that individual councils will choose to progress actions in the context of their individual circumstances, priorities and budgets, unique requirements and expectations of different communities with the goal being maximum alignment, flexibility and collaboration. It also critical to the understanding of the Plan, that its implementation is not possible without substantial funding assistance from the Commonwealth and Queensland Governments.

The Plan will be used to support requests for funding and assistance from the Commonwealth and Queensland Governments, and while it provides the primary vehicle for accessing available funding from the Queensland Government's Recycling and Jobs Fund, there may also be opportunities for initiatives to be funded that are not yet identified in the Plan. For clarity, it is recognised that the Plan is a living document and that it is also intended to auspice projects and activities not specifically identified at the time of its development, with those projects and activities clarified throughout the life of the Plan.

The population of the WBB region was reported to be 310,728 in 2021 with a population density of 6.39 persons per square kilometre over a total land area of approximately 48,598 square kilometres.[1] Population is forecast to grow within the region to between 324,778 and 396,515 by 2041[2]. Growth across the region is forecast to be highest in Bundaberg (19%), Fraser Coast (21%), Gympie (15%) and South Burnett (12%) LGAs, with Cherbourg Aboriginal Shire Council to experience modest (6%) growth and North Burnett Regional Council expected to contract marginally by 2%. Land use within the region is predominantly rural, with rural-residential, residential, commercial, and industrial land uses in numerous urban centres and small townships. The Wide Bay Burnett Region's Gross Regional Product is estimated at $14.19 billion, which represents approximately 3.79% of the state's Gross State Product (GSP)[3] and contributes 109,360 local jobs.

[1] Regional Development Australia, Wide Bay Burnett, 2023. RDA Wide Bay Burnett Region – Community Profile
[2] Queensland Government population projections, 2018 edition; Australian Bureau of Statistics, Population by age and sex, regions of Australia, 2016 (Cat no. 3235.0).
[3] Regional Development Australia, Wide Bay Burnett, 2023. RDA Wide Bay Burnett Region – Economic Profile https://economy.id.com.au/rda-wide-bay-burnett

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Current state

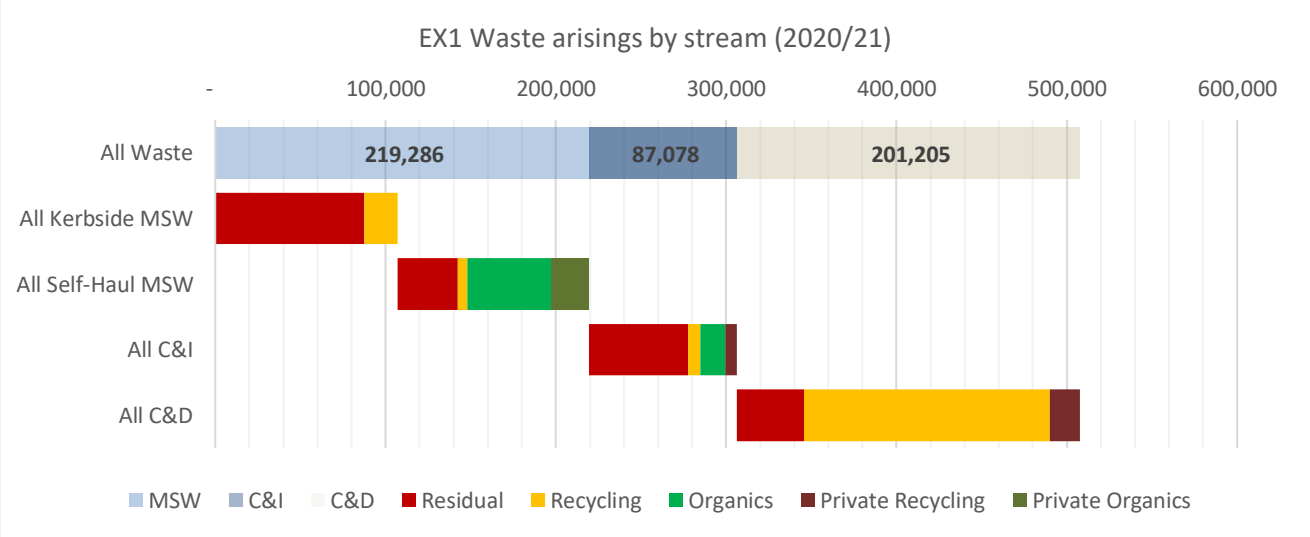
Waste arisings and services

Councils in the WBB region managed a total of 461,269 tonnes of waste in the 2020-21 financial year (FY20-21). This included (see **Figure EX1**):

- 197,286 tonnes of household waste
- 80,378 tonnes of commercial and industrial waste
- 183,605 tonnes of construction and demolition waste

A further 46,300 tonnes of private sector waste was identified as managed in the region. The combined arisings incorporating both council and private sector data, where available, are presented in **Figure EX1**.

Bundaberg Regional Council (42%) and Fraser Coast Regional Council (36%) manage the highest proportion of waste with Gympie Regional Council (9%), North Burnett Regional Council (4%), South Burnett Regional Council (9%) and Cherbourg Aboriginal Shire Council (<1%).



Without intervention, waste managed by councils in the region is forecast to grow to 545,000 tonnes in FY30-31, 582,000 tonnes in FY40-41 and 619,000 tonnes in FY50-51.

All Councils offer a kerbside residual waste collection service. Bundaberg Regional Council, Cherbourg Aboriginal Shire Council, Fraser Coast Regional Council, Gympie Regional Council and South Burnett Regional Council currently provide a 2-bin collection system comprising residual waste and kerbside recycling.

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All Councils offer a form of self-haul facility which receive householder, commercial and industrial, and construction wastes. This includes significant amount of garden organic waste managed at Council transfer and resource recovery facilities. Problematic wastes with limited currently available recovery options in the region include construction and demolition wastes (e.g., masonry, aggregates, and concrete), contaminated soils, e-waste, food and garden organics, timber, textiles, and tyres.

The plan identifies several regional or cross-regional solutions for these but acknowledges that Queensland or Commonwealth Government leadership and interventions will be needed for some of the more problematic waste streams.

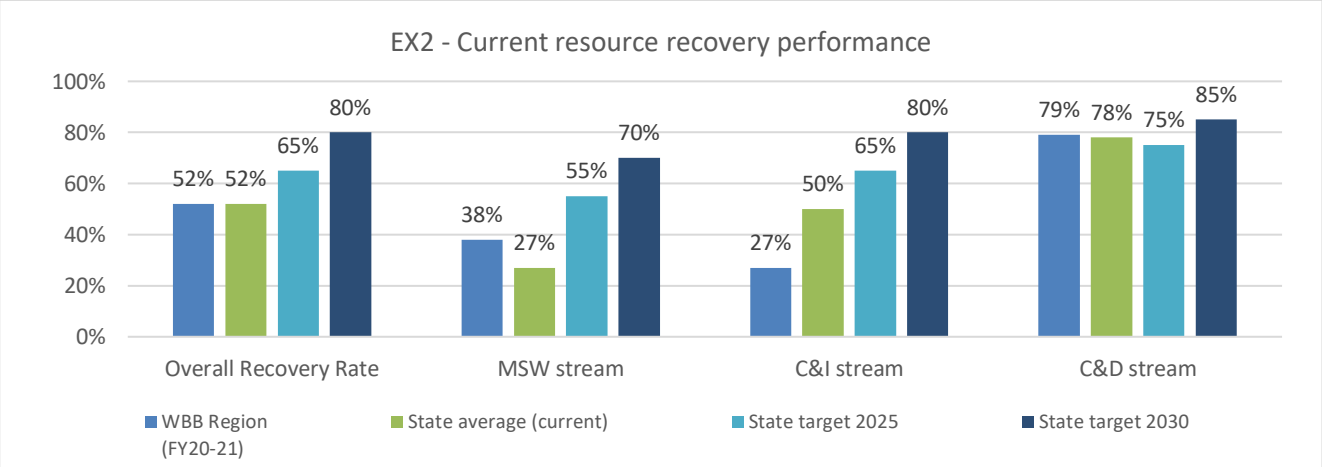
Key issues

To inform the development of this Plan, several key issues identified that were considered to limit waste outcomes in the region including:

- Some landfills in the region are approaching capacity which may prohibit long-term future landfilling.
- Individual councils do not have sufficient scale for processing or remanufacturing recyclable materials or residual waste.
- There are insufficient current local end markets for recycled materials and secondary raw materials, except for organic waste, generally limiting the commercialisation of resource recovery.
- Community behaviour lacks understanding to support production of high-quality recyclable output.
- Current policy settings do not support greater recovery and recycling.

Current performance against Strategy targets

The WBB region has a current recovery rate of 52% across all streams, compared to a current state average of 52% and 2025 state target of 65%. The MSW and C&D streams are consistent with the state average, whilst the C&I stream is performing poorly. Across all streams except C&D, the 2025 and 2030 targets are however challenging without intervention, as shown on **Figure EX2**.



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Plan outcomes

Education as a primary focus

A regional waste and recycling education strategy has been identified by Councils to focus investment on education and behaviour change activities that promote better outcomes for the region. Education will focus on problem areas including reducing the kerbside recycling bin contamination rates, which diminishes the value of sorted material and can increase operational costs. Other areas of focus will include food waste avoidance programs, and other behaviour change activities which educate residents on the benefits of getting recycling right.

The regional education strategy will be developed through collaboration by Councils in the region however will require investment from the Queensland Government to prepare and implement. Through further investment, this Strategy, and the resources deployed could also target education of waste producers in the C&I stream to drive better resource recovery outcomes.

Cherbourg Aboriginal Shire Council will develop its own community specific education plan to align with other education services in the area.

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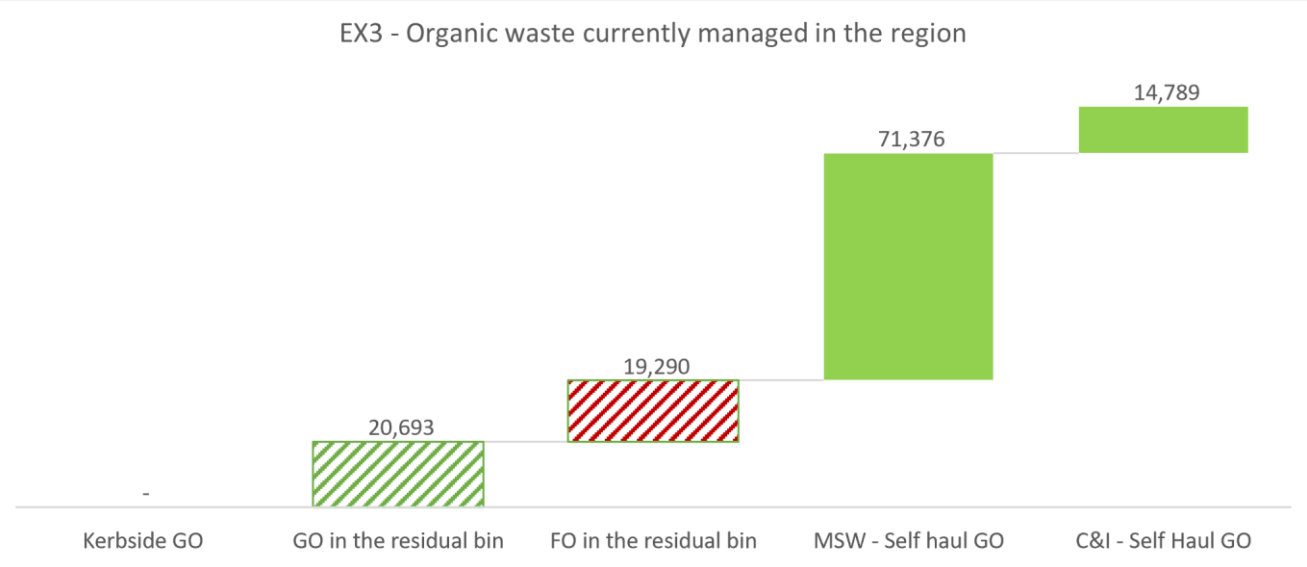
Improved organic waste management

The WBB region already recovered and recycled 86,165 tonnes of organic waste in FY20-21 through material delivered to Council resource recovery facilities. A further 40,000 tonnes of food and garden organics is estimated to currently go to landfill (as show in **Figure EX3**) representing an opportunity in the region to divert some of this material from landfill and into organic waste recycling through composting, whether at commercial facilities, at home, or via community facilities.



In the region, policy and economic settings suggest that Bundaberg Regional Council and Fraser Coast Regional Council have sufficient volume to introduce a separate kerbside collection for organic waste, to be processed in the region. For other councils in the region current policy settings may limit the potential establishment of kerbside organic waste services.

For those parts of the region that cannot access a kerbside organic waste collection service, the Queensland Government should establish mechanisms to participate in composting through community gardens or composting hubs, or by providing access to at-home compositing infrastructure such as compost bins or worm farms. These interventions will be implemented as soon as practically possible and dependent on availability of funding. Food waste avoidance education should also be rolled out across the region.

Economic analysis identified that the introduction of a new kerbside organics service would result in extra cost. The estimated cost for Bundaberg Regional Council and Fraser Coast Regional Council for a new organics collection service including recycling at a private sector organic waste processing is estimated at **$153.5 million** (present value) assuming councils procure a service from an existing organic waste processing provider and over the 30-year model period. This assumes that open windrow composting is the preferred technology. The estimated annualised cost increase compared to business as usual, allowing for increasing levy costs, would be an additional estimated **$55 per household** per year (present value, annualised) allowing for the residual bin collection being reduced to fortnightly where a kerbside organic waste collection is available. This includes:

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- One-off-transition costs to purchase consumables and distribute to households including new bins, kitchen caddies, and compostable liners estimated at **$2.7 million** for Bundaberg Regional Council and **$3.1 million** for Fraser Coast Regional Council.[4]
- An additional potential one-off cost of $11-$21 per bin may also be incurred to change current residual bin lids from green to the standardised red.
- Additional establishment education and ongoing annual organics diversion education costs just for FOGO implementation are included in the estimate of an initial at **$0.27 million per annum** for Bundaberg Regional Council and **$0.29 million** per annum for Fraser Coast Regional Council, expected to commence 2-years before a new service commences.

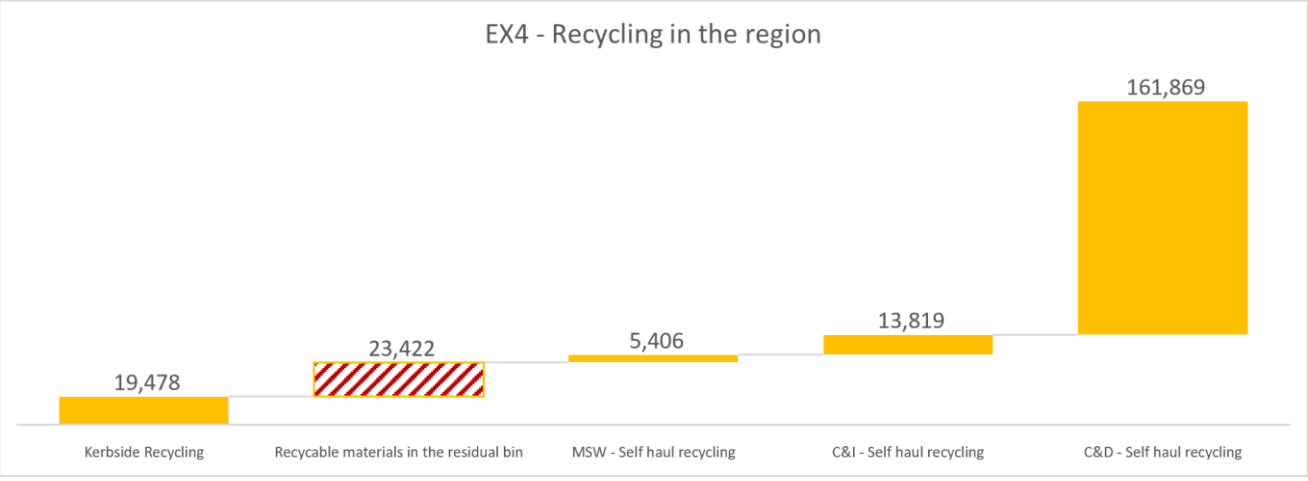
Whilst nothing in this Plan precludes other Councils from introducing a kerbside FOGO collection and processing solution, under current policy settings, the comparable cost per household would be higher due to 100% of landfill levy paid being returned to council in annual advance payments, in addition to the lack of scale and large distances required to transport waste for processing. Similar proportional costs may be incurred by other Councils progressing organic waste diversion.

It is estimated that the introduction of FOGO collection services in both Bundaberg and Fraser Coast Regional Council areas could capture an initial 28,000 tonnes of organic waste for recycling. At a regional scale this is forecast to improve the overall resource recovery rate from the existing 52% to an estimated 59% upon commencement in FY26-27. Between FY26-27 and FY30-31 this could divert an estimated additional 140,000 tonnes of organic waste from landfill into recycling.

Material recovery and recycling

Household kerbside stream

In FY20-21, 200,572 tonnes was reported as recovered in the region, of which the household kerbside collection of dry recyclables contributed 19,478 tonnes, and clean earth contributed 134,000 tonnes of the overall C&D recycled amount (see Figure **EX4**).



[4] Assumes estimated 80% coverage of FOGO service across local government area. Actual number may vary.

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At present Bundaberg Regional Council, Fraser Coast Regional Council, Gympie Regional Council and South Burnett Regional Council collect kerbside recyclables individually on a fortnightly basis. Cherbourg Aboriginal Shire Council collects kerbside recyclables individually on a weekly basis, and North Burnett Regional Council does not currently offer a kerbside recyclables collection service.

Bundaberg Regional Council and Fraser Coast Regional Council deliver to their own MRFs for processing, with Fraser Coast in the process of developing a new MRF. Gympie Regional Council, South Burnett Regional Council and Cherbourg Aboriginal Shire Council direct their kerbside recyclables to the Cherbourg MRF for processing.

Contamination of the kerbside commingled bin in the region ranges up to 16-18%.

It is estimated that there is also approximately 23,500 tonnes of dry recyclable material in the kerbside residual waste bin that could potentially be captured.

Through focussed education campaigns as part of the regional education strategy it is expected that contamination will be reduced, and that there will be greater capture of recyclable material currently lost to landfill. There are material recovery facilities in Bundaberg and Cherbourg, with a new potentially regional scale facility to be operational in Maryborough in 2024. It is also proposed to install glass processing and washing equipment in Maryborough through implementation of this Plan.

There may be opportunities for the establishment of new recycling or reprocessing facilities in the region aligned with the Queensland Governments precinct approach, however this requires further refinement. Target reprocessers may access organic waste, C&D waste (clean earth, masonry, aggregates, and concrete), agricultural plastics, e-wastes, timber, and solar panels.

To facilitate future development and better diversion through resource recovery facilities, an allowance has also been made in the economic analysis for improvements to transfer facilities, additional operating costs, and transport to move recyclables from satellite sites to processing hubs and to upgrade existing sites and convert old landfills to transfer stations. This may also include community recycling hubs or hazardous waste transfer facilities, and implementation of circular economy solutions.

The estimated cost to implement the material recovery and recycling interventions is an incremental **$47 million** (present value) equivalent to an annualised cost of approximately $17 per household per year. This includes:

- Estimated capital expenditure of approximately **$6.5 million** for new glass processing and washing technology to be deployed, and ongoing operational costs for over the 30-year lifetime.
- Small-scale transfer infrastructure improvement indicative budget of **$7.5 million**.
- Allowances for funding supported improvements to provide household hazardous waste facilities, waste stream audit and other initiatives to support better segregation and understanding of waste flows in the region.
- The development and delivery of a regional education strategy that applies across all Councils to provide education priorities in collaboration with the Queensland Government, estimated to be **$1 million** per annum commencing immediately.

It is assumed that additional education costs are funded by the Queensland Government. These changes are focussed on improving the quality and quantity of material captured for recycling and educating. A separate education plan will be developed by Cherbourg Aboriginal Shire Council specific to community needs.

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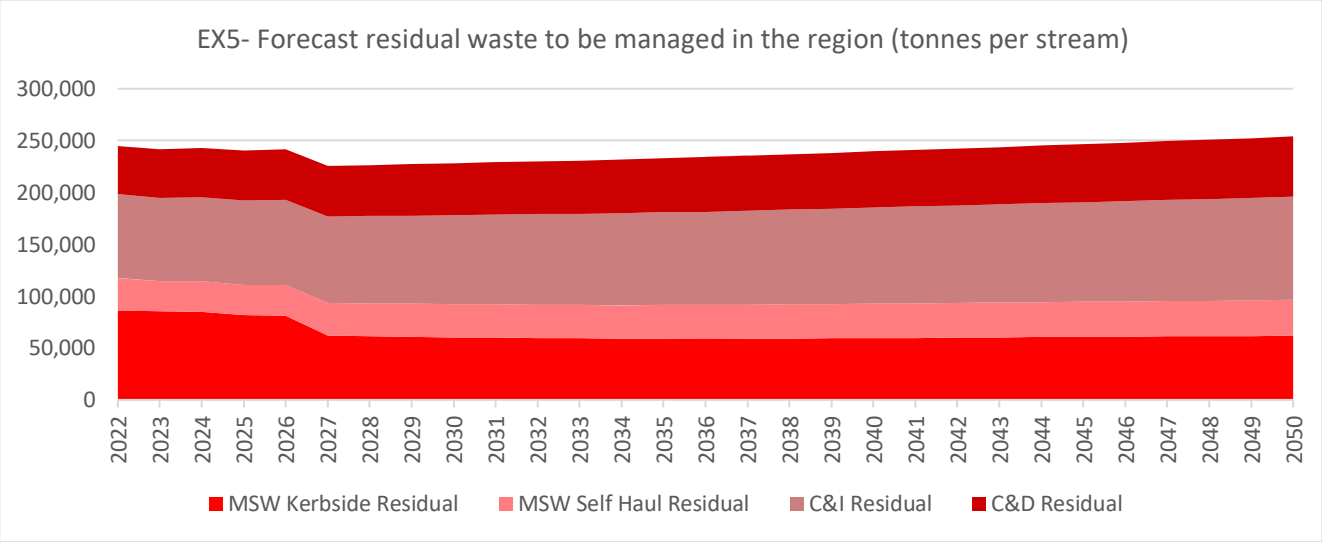
Residual waste management in the long-term

In FY20-21, approximately 221,000 tonnes of residual waste was managed, of which 123,000 tonnes was generated directly by households. With the interventions identified in this Plan, resulting residual waste is expected to be 229,000 tonnes by FY30-31, 241,000 tonnes by FY40-41 and 256,000 tonnes by FY50-51 (see **Figure EX5**). For the household derived MSW stream only, Councils are forecast to need to manage 92,000 tonnes of residual waste in FY30-31, 93,000 tonnes in FY40-41 and 97,000 tonnes by FY50-51.



Challenges identified in the development of this Plan with regard to residual waste management include:

- Gympie Regional Council has an immediate need for new landfill capacity.
- Other councils are running out of approved and constructed landfill capacity in the medium term.
- The cost of residual waste management is expected to increase as new capacity is required, or alternative solutions procured.
- The immediate cost of landfilling is also rapidly increasing for Bundaberg Regional Council and Fraser Coast Regional Council due to changes in annual advanced payments.

In developing this Plan, councils did not expect to develop energy from waste (EfW) facilities within the region but recognised the potential to send residual waste from within the region to energy from waste facilities, if established outside the region. The estimated cost per household of diverting residual waste to an out of region EfW facility is likely to be significantly greater than continued landfilling. As technology evolves smaller scale regionally located facilities may be established by the private sector which could prove an alternative solution to sending out of region.

Other problematic streams identified in the residual waste stream include timber and contaminated soils. Long term solutions for these streams that avoid the need for landfill will be developed at a regional scale and implemented.

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Expected recycling and resource recovery outcome of the Plan

To achieve an estimated regional resource recovery rate of approximately 60%, which amounts to an overall improvement of 8% for the region, and an estimated 22% improvement in recovery rate on the kerbside MSW stream, Bundaberg Regional Council and Fraser Coast Regional Council would need to introduce an organics diversion service targeting FOGO waste. This should be coupled with improvements to the existing yellow top bin recycling services through a combination of improved transfer facilities and education.

Beyond this, significant improvements to current material handling and management, including the C&I stream are required, but only after data for non-council managed wastes are collected and assessed.

In the longer term, the primary pathway to get closer to the Queensland Government's resource recovery targets of 90% of waste diverted from landfill by 2050 would require a significant proportion of residual waste to be sent to EfW. Under current policy settings this is expected to be more expensive than sending the same waste to landfill.

Implementation

Cost to deliver the Plan

The estimated cost for implementation (excluding residual waste management) is **$84 million** over the period FY23-24 to FY30-31 as presented in **Table EX1**.[5]

Table EX1 Indicative Cost Estimate (costs in millions, p50 accuracy)

Item	2024	2025	2026	2027	2028	2029	2030	2031	Total to FY31
Regional Implementation									
Regional Support Resource	0.25	0.26	0.26	0.27	0.28	0.28	0.29	0.30	2.18
Administrative & Legal	0.10	-	-	-	-	-	-	-	0.10
Develop detailed implementation plan	0.05	-	-	-	-	-	-	-	0.05
Review Plan	-	-	-	-	0.10	-	-	-	0.10
Meetings (Council FTE requirement)	0.05	0.05	0.05	0.05	0.05	0.06	0.06	0.06	0.43
Council contribution to actions	0.05	0.05	0.05	0.05	0.05	0.06	0.06	0.06	0.43
Sub Total – Plan Implementation	**0.50**	**0.36**	**0.36**	**0.37**	**0.48**	**0.39**	**0.40**	**0.41**	**3.28**
Regional Education Strategy									
Education Strategy (and updates)	0.05	-	0.02	-	0.02	-	0.02	0.00	0.10
FOGO implementation, BRC/FCRC only	Captured within organic implementation costs below								-
Kerbside Education & Other	Captured within material recycling & recovery costs below								-
Sub-Total – Regional Education	**0.05**	**0.00**	**0.02**	**0.00**	**0.02**	**0.00**	**0.02**	**0.00**	**0.10**
Regional Organics Solution[6]									

[5] Costs are estimated to a maximum of p50 accuracy where presented in this Plan
[6] Costs for new services presented here do not include benefits (e.g., reduced levy, reduced use of landfill airspace) however these savings are represented in the economic analysis. These costs represent actual costs for implementation. Benefits may not be realised at the same time.

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Item	2024	2025	2026	2027	2028	2029	2030	2031	Total to FY31
FOGO Implementation, BRC only									
Administration, business cases, PM	0.20	0.20	0.08	0.08	0.08	0.08	0.08	0.08	0.88
FOGO education costs (new service BRC)	-	0.26	0.27	0.27	0.28	0.29	0.29	0.30	1.97
One off investment (bins) (BRC)	-	-	-	2.74	-	-	-	-	2.74
Collection costs (new, BRC)	-	-	-	1.71	1.75	1.80	1.84	1.89	8.99
Processing Costs (new, BRC)	-	-	-	1.56	1.60	1.65	1.69	1.75	8.24
FOGO implementation, BRC only	**0.20**	**0.46**	**0.34**	**6.35**	**3.71**	**3.81**	**3.91**	**4.02**	**22.80**
FOGO Implementation, FCRC only									
Administration, business cases, PM	0.20	0.20	0.08	0.08	0.08	0.08	0.08	0.08	0.88
FOGO education costs (new service)	-	0.29	0.30	0.31	0.32	0.32	0.33	0.34	2.21
One off investment (bins) (FCRC)	-	-	-	3.08	-	-	-	-	3.08
Collection costs (new, FCRC)	-	-	-	1.92	1.97	2.02	2.07	2.12	10.11
Processing Costs (new, FCRC)				1.56	1.61	1.66	1.71	1.77	8.32
FOGO implementation, FCRC only	**0.20**	**0.49**	**0.38**	**6.95**	**3.98**	**4.09**	**4.20**	**4.32**	**24.59**
Organics Programs									
Community composting	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.80
Roll out of compost bin program	-	0.31	-	-	-	-	-	0.31	0.61
Material flow analysis - organics	0.01	0.02	-	-	-	-	0.02	-	0.05
Sub-Total – Organics Programs	**0.11**	**0.43**	**0.10**	**0.10**	**0.10**	**0.10**	**0.12**	**0.41**	**1.46**
TOTAL (Regional Organics Solution)	**0.51**	**1.38**	**0.82**	**13.40**	**7.79**	**8.00**	**8.23**	**8.74**	**48.86**
Material recovery & recycling solution									
Education Implementation (kerbside + other)	0.98	1.01	1.03	1.06	1.09	1.11	1.14	1.17	8.59
Education Plan (Cherbourg)	-	0.05	0.02	0.02	0.02	0.02	0.02	0.02	0.18
Small scale infrastructure improvements	-	1.25	1.25	1.25	1.25	1.25	1.25		7.50
Community circular economy programs	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.40
Household Hazardous Waste CRCs	-		0.20	0.20	0.20	0.20	0.20	0.20	1.20
Glass processing & washing plant	-	0.20	7.00	1.00	1.03	1.05	1.08	1.10	12.46
Supplementary funding for Waste Audits	0.08	0.08	0.08	0.09	0.09	0.09	0.09	0.10	0.70
TOTAL (MRR Solution)	**1.11**	**2.64**	**9.64**	**3.67**	**3.72**	**3.78**	**3.83**	**2.64**	**31.03**
Residual Waste									
Progress & implement R&D into problematic wastes	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.80
TOTAL (Residual Solution)	**0.10**	**0.10**	**0.10**	**0.10**	**0.10**	**0.10**	**0.10**	**0.10**	**0.80**
OVERALL TOTAL – IMPLEMENTATION COST FOR RWRRP TO FY30-31	**2.07**	**4.48**	**11.18**	**17.53**	**12.10**	**12.26**	**12.57**	**11.89**	**84.10**

All costs presented in Million $ based at 2023 rates, BRC-Bundaberg Regional Council, CASC-Cherbourg Aboriginal Shire Council, FCRC-Fraser Coast Regional Council, GRC-Gympie Regional Council, NBRC-North Burnett Regional Council. SBRC-South Burnett Regional Council

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Processing costs assume that councils pay a gate fee for organic waste processing. Prior to business case and location confirmation, it is assumed that an open windrow facility will be utilised, with gate fee reflective of this. If alternative organics processing technology is utilized, costs may be higher.

Waste facility infrastructure improvements provides an allowance per year. A detailed assessment of individual council upgrade needs has not been undertaken. This cost may be higher or lower as determined by detailed design and cost estimation, and available funding.

Access to supporting resources and funding

Evidence prepared in development of this Plan indicatives the cost of implementation will be significant compared to the current state. There is a need for support around the development of business plans and forecasting suitable for approval by the Queensland Government, particularly for infrastructure such as new or improved transfer facilities, new collections, or processing infrastructure. Access to regional facilitation / coordination support resources is essential for Councils implementation of the Plan, as would funding support to develop supporting documentation for funding applications. Implementation at the regional scale will also require funding to coordinate and liaise with the Queensland Government, and advocate for better waste outcomes in the region.

Funding for capital expenditure such as an organic waste processing facility (or enhancements to existing privately owned facilities), small scale infrastructure improvements, or potentially an energy from waste facility may also be facilitated by the Queensland Government, pending specific business case development.

Regional collaboration and responsibilities

To support development of this Plan, the region has utilised a collaborative approach to strategy development and implementation by establishing a specific working group. To implement the Plan, the region is required to formalise a working group. This group will continue to collaborate on Plan implementation, and seek to undertake regional procurement where beneficial, as well as collaborate on the implementation of education and awareness campaigns. This is a critical action required to be commenced immediately following finalisation of the Plan. The Queensland Government will fund a project or program manager to deliver the Plan. Depending on procurement and ownership decisions around certain infrastructure, there may be a need to establish additional governance structures.

Responsibility for decision making for the implementation of interventions under this Plan will sit with individual councils facilitated by the RRWG. The RWWG will coordinate funding requests required to the Queensland Government for approval under the following proposed structure:

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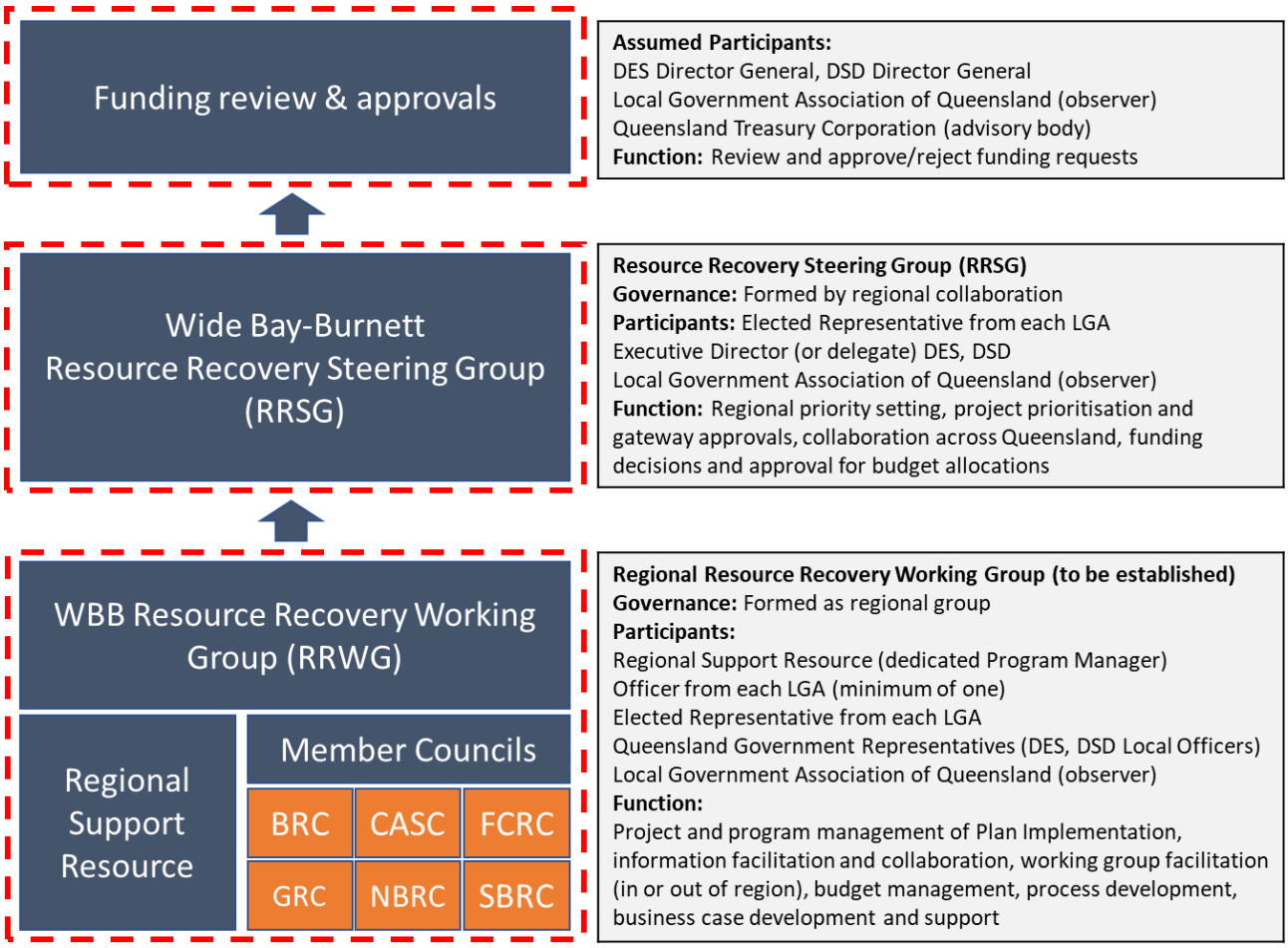

Figure EX6 – Regional governance structure

Review and monitoring

Implementation of the Plan will be the responsibility of the regional steering group through the regional facilitation / coordination support assistance. Initial actions will be measured against progress, but longer-term review should be against metrics including delivery of specific services identified in the Plan and achieving levels of education, capture of types of waste (e.g., FOGO, GO, Dry Recyclables) and resultant change to recovery rates compared to forecast. The Plan will be scheduled for review and update every 5-years, although it can also be reviewed at any time decided by the region.

The Plan is high level, and a set of detailed actions would need to be developed as part of the next stage of its implementation. It is also important to note that the Plan does not remove the need for councils to have individual strategies and drive their own local agenda. Councils, through regional collaboration, will have control over implementation of the Plan, and the subsequent more detailed action plan, to be delivered in co-operation with the Queensland Government.

Councils that endorse the Plan, are not obliged to deliver on any outcomes if they choose not to. Councils can be part of the Plan's future development but opt out later or choose actions that better align with their objectives.

EXECUTIVE SUMMARY

The Plan will be used to support requests for funding and assistance from the Commonwealth and Queensland Governments, and while it provides the primary vehicle for accessing available funding from the Queensland Government's Recycling and Jobs Fund, there may also be opportunities for initiatives to be funded that are not identified in the Plan. For clarity, it is recognised that the Plan is a living document and that not all potential initiatives will have been identified at the time of its development.

Implementation roadmap

An implementation roadmap has been developed identifying timing and activities to deliver this Plan, as show in **Table EX2**.

While the regional waste management plan provides the primary vehicle for accessing available funding from the Recycling and Jobs Fund, there may also be opportunities for initiatives to be funded that are outside the plan. For example, a pilot at a local level to 'test' the suitability of a model or infrastructure for the region (or sub-region). It is recognised that the plan needs to be a living document and that not all potential initiatives will have been identified in the plan.

However, it is expected that the bulk of the funding will come through the projects identified in the plan with a more streamlined pathway for funding approvals as it has already been identified in the plan. In the first instance any projects identified that are outside the plan would likely be discussed with the regional working and steering groups and the proposed regional support resource position that will be funded to support implementation of the plan, to assess suitability for funding under the plan or whether this would be considered under a separate funding process.

Councils, in participating in the development of this plan and subsequent endorsement of or support for its finalisation and publication, can do so in the knowledge that this consideration does not obligate individual Councils to any funding commitment. Subsequent business cases developed as part of implementing the plan and implementation decisions made by the region for implementing the plan would normally include that detail.

Cherbourg Aboriginal Shire Council is a member of the Wide Bay Burnett region for the purpose of developing and implementing this Plan. Cherbourg Aboriginal Shire Council has been consulted during the development of this Plan and agreement reached for the first stage to refine its own local waste reduction and resource recovery plan which would then be acknowledged in the implementation of the Wide Bay Burnett Regional Waste and Resource Recovery Plan. This Plan should be read and interpreted with this inclusion in mind.

EXECUTIVE SUMMARY

Table EX2 Implementation Roadmap

Action	Responsibility	Immediate	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2040	2050
		Next 2 years			Within next 5 years			Within next 10 years					To 2040	To 2050
General														
Establish regional waste working group to implement Plan	All													
Program management	WRRSG/WRRWG													
Regional collaboration (e.g., Working group meetings, action management, etc.)	WRRSG/WRRWG/All													
Focus on local employment where opportunities present	WRRSG/WRRWG													
Provide capacity building on issues / matters as identified by member councils and engage experts to assist as required	WRRSG/WRRWG													
Advocate for Transport subsidies consideration	WRRSG/WRRWG													
Focus on local employment where opportunities present	WRRSG/WRRWG													
Organic Waste Management														
Participate in Education and Behaviour Change Initiative (assumed continuation) as part of regional education strategy – incorporating a food waste avoidance component	WRRWG, All													
Review potential for behaviour change regulation (new services)	BRC, FCRC													
Roll out of at-home composting solutions	QGOV													
Develop business case for organics collection service for council approval including refinement of market price for recycled organics	BRC, FCRC													
Commence new organic waste collection service education	BRC, FCRC													
Procurement of organic waste collection solution	BRC, FCRC													
Procurement of organic waste processing solution	BRC, FCRC													
Commence and operate kerbside organic waste collection service (pending individual council approval)	BRC, FCRC													
Continuation of self-haul green waste receipt and processing	All													
Roll out of community composting solutions including guidance	QGOV													
Collaborate on regional solution for finding highest value market for green waste across region	WRRWG													
Develop regional solution for biosolids and timber	WRRWG													
Develop pathway to improve non-Council held data collection	QGOV, All													
Material Recycling & Recovery														
Participate in Education and Behaviour Change Initiative (assumed continuation) and develop regional education strategy, implement	WRRSG/WRRWG, All													
Review & agree pathway for improved enforcement activity for poor household behaviours in kerbside bin service provision, and implement	WRRWG, All													
Seek opportunities to collaborate on regional collections approach when contracts allow	WRRWG, All													
Develop business case for funding of glass processing and washing solution	FCRC													
Procure, construct and commission glass processing and washing solution	FCRC													
Develop business case, designs for new or improved transfer facilities	All (as required)													
Construct and commission upgrades or new transfer facilities	All (as required)													
Collaborate on establishment of regional scale precinct and ancillary satellite sites in accordance with precinct guidelines	WRRWG, All													

EXECUTIVE SUMMARY

Action	Responsibility	Immediate	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2040	2050
		Next 2 years			Within next 5 years			Within next 10 years					To 2040	To 2050
Construct enabling infrastructure for precinct	QGOV													
Establish new resource recovery processing facilities within precinct	GGOV, All support													
Work with Queensland Government agencies to improve uptake or recycled materials in procurement	QGOC, WRRWG													
Develop pathway to improve material flow data and knowledge across region for recyclable material	QGOV, WRRWG													
Collaborate to collect data on contamination within kerbside bins to improve education approach.	RWWG, WRRWG													
Residual Waste Management														
Councils to consider individual landfill capacity needs in short-medium and long-term	WRRWG, All													
Assist councils to develop new landfill opportunities including regional or sub-regional facilities.	WRRSG, WRRWG, All													
Consider long-term options and approach to managing residual waste in the long-term, pending availability of facilities out of region	WRRWG, All													
Feasibility and detailed business cases to support involvement in future EfW projects in or ex-region as opportunities emerge.	WRRSG, WRRWG, All													
Develop long-term approach to managing problem and emerging wastes	WRRWG, All													

Notes: BRC-Bundaberg Regional Council, CASC-Cherbourg Aboriginal Shire Council, FCRC-Fraser Coast Regional Council, GRC-Gympie Regional Council, NBRC-North Burnett Regional Council, SBRC-South Burnett Regional Council; ALL: Indicates collaborative activities for all councils to participate in. WRRSG- Waste and Resource Recovery Steering Group. WRRWG-Waste and Resource Recovery Working Group (including Regional Support Resource), QGOV-Queensland Government and Agencies

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(DO NOT DELETE SECTION BREAK)

Glossary

Acronym	Details
Annual advance payment	A payment made by the Queensland Government as part of a commitment made to avoid there being a direct impact of the waste disposal levy on households. Councils receive a percentage (depending on levy zone) of the amount paid in waste disposal levy on household waste as an advanced payment.
Capital Expenditure (CAPEX)	An expense incurred through the additional of capital infrastructure works
C&D	Construction and demolition – Waste generated by demolition and excavation companies, builders, contractors, and property developers. The waste from these activities can include excavated material, waste asphalt, bricks, concrete, plaster, timber, vegetation, asbestos, and contaminated soils.
C&I	Commercial and Industrial – Waste generated by manufacturers, shops and business of all sizes and varieties.
Circular economy	A model of production and consumption that avoids waste and depletion of finite resources through the reuse of materials and assets.
Composting	Repurposing of organic waste to produce compost or other soil improver products, which are then sold into landscaping and agricultural markets
DES	Department of Environment and Science – A department of the Queensland Government driving sustainability, wellbeing, and scientific excellence.
Diversion	Diversion in the context of this report refers to diversion of waste from landfill to an alternative recovery pathway
EFW	Energy from waste: Interchangeably termed 'waste to energy'. A collection of treatment processes and technologies used to generate a usable form of energy, for example, electricity, heat, and fuels, from waste materials. The Queensland EfW Policy defines EfW under four categories: biological, chemical, mechanical, and thermal.
Expanded polystyrene (EPS)	A lightweight cellular plastic material, widely used in building and construction, and packaging.
FOGO collection	Food Organics and Garden Organics – Refers to a kerbside collection service of combined food and garden waste, mostly from domestic or municipal sources in one collection bin
Infrastructure	Infrastructure in the context of this report refers to waste and resource recovery infrastructure unless otherwise noted
In-vessel composting	Composting technology involving the use of a fully enclosed chamber or vessel in which the composting process is controlled by regulating the rate of mechanical aeration
Leachate	A form of wastewater that has percolated through waste such as that in landfills
Mixed recyclables	Comingled recyclable materials including plastic, aluminium, glass, steel, and paper
MRF	Material recovery facility – A Plant that separates and prepares recyclable materials to sell to end users as raw materials for new products.
MSW	Municipal Solid Waste – Primarily the waste and recyclables generated by households and collected by Councils but may also include other Council generated wastes
Operating expenditure (OPEX)	An expense a business incurs through its regular business operations.
Organics processing	The processing of organic materials into beneficial products such as soil conditioners and mulch
PEF	Process Engineered Fuel, also known as refuse derived fuel (RDF), is a solid fuel produced after processing of waste, for example in a dirty MRF, to increase the calorific value, homogenise the material, remove recyclable materials, remove inert materials, and remove hazardous contaminants

Acronym	Details
Processing facilities and infrastructure	Facilities which either receive materials directly from collection systems or from recovery facilities for further sorting and/or processing to provide material for use in the generation of new products.
PV	Photovoltaic- mechanism used in solar panels
Product stewardship	Recognition of the shared responsibility to reduce the environmental and human health and safety impacts of products and materials over their life from design to disposal.
QWDS	Queensland Waste Data System. The web-based data system used by the Queensland government to collect data from operators. Depending on reporting entity there are different reporting requirements. Data from QWDS has been utilised to inform this Plan.
Recyclate	Raw material transported to a waste recycling facility or a material recovery facility for processing into a new material or product
Reprocessing	Changing the physical structure and properties of a waste material that would otherwise have been sent to landfill to add value to the processed material and prepare it for reuse.
Resource recovery	The process of obtaining matter or energy from discarded materials
Secondary processing	Taking pre-sorted materials and changing their physical and/or chemical nature, adding value to the processed material so that it can become a feedstock for a manufacturing process or re-enter the economy
Single use plastic	Materials primarily made from petrochemicals to be disposed of directly after use. Commonly used for packaging and service ware, such as bottles. Wrappers, straws, and bags.
Sustainable procurement	Meeting the need for materials, goods, utilities, and services in a sustainable, environmentally friendly, responsible, and ethical way.
WBB	Wide Bay Burnett, refers to the collective region comprising Bundaberg Regional Council, Cherbourg Aboriginal Shire Council, Fraser Coast Regional Council, Gympie Regional Council, North Burnett Regional Council, and South Burnett Regional Council.

1 Introduction

Councils in the Wide Bay Burnett (WBB) region and the Queensland Government recognise the importance of regional implementation in the delivery of Queensland's *Waste Management and Resource Recovery Strategy*[7] (WMRR Strategy). The Local Government Association of Queensland (LGAQ) is therefore supporting the development of the Wide Bay Burnett Regional Waste and Resource Recovery Plan (the Plan) on behalf of the Councils within the Wide Bay Burnett region. This plan details a clear path for the future of waste management, resource recovery and recycling in the region through providing strategies and actions to strengthen regional collaboration regarding the delivery and improvement of waste management and resource recovery services across the region.

The intention of the plan is to provide long-term direction to 2050 for the needs of the region in terms of critical waste streams, infrastructure, and the identification of a particular suite of levers required to achieve regionally specific targets. Specific activities and actions in the short- to medium-term are identified, where there is a relatively high degree of certainty in process and outcome. Longer-term activities and actions are expected to be implemented later in the program of works or require further refinement and development. It is anticipated that the plan will require a degree of flexibility.

The Plan aims to achieve a balance between a clear implementation plan for the best whole of system outcome for the region, while reflecting the needs and wishes of each individual council and their rate payers.

The Plan will be used to support requests for funding and assistance from the Commonwealth and Queensland Governments, and whilst it provides the primary vehicle for accessing available funding from the Queensland Government's Recycling and Jobs Fund, there may also be opportunities for initiatives to be funded that are not identified in the Plan. For clarity, it is recognised that the Plan is a living document and that not all potential initiatives will have been identified at the time of their development.

1.1 Purpose

The objectives of the Plan are to address problems and opportunities with the current waste management in the region and specifically to:

- Maximise the value of waste, including problematic waste streams.
- Deliver the best pathway for the region that identifies opportunities for government co-funding arrangements, and industry investment or co-investment.
- Provide councils with the data and options analysis required to make informed decisions about policy, location of infrastructure and optimal value for money investment, and non-infrastructure options
- Support improved waste management, resource recovery and recycling practices to contribute towards agreed regional and state targets
- Encourage and support opportunities to embed circular economy principles into business-as-usual practices, including through sustainable procurement principles
- Encourage and support job creation and economic and market development opportunities.
- Improve environmental outcomes for the community.

[7] Queensland Government, 2019. *Waste Management and Resource Recovery Strategy*

- Identify non-infrastructure and social and community benefits and
- Establish and maintain collaborative relationships with key stakeholders to drive long-term sustainable outcomes.

This Plan is also a roadmap outlining actions and identifying and prioritising funding opportunities for the Queensland Government. Many councils do not have the resources to fully fund major waste infrastructure or behaviour change initiatives and as such, funding support may need to be sourced from the Queensland or Commonwealth Government fir opportunities to be realised.

1.2 The region

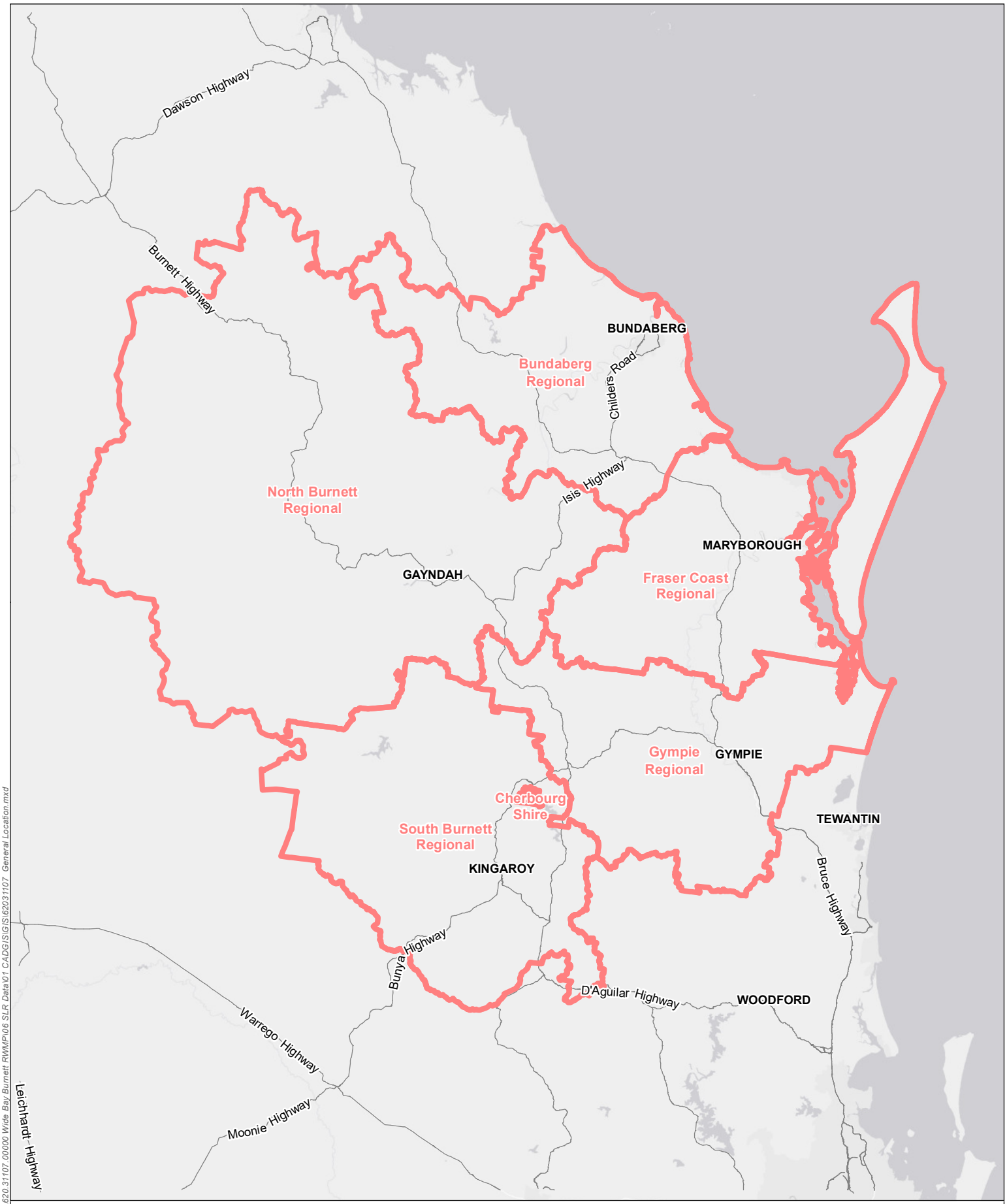
This Plan is specifically for the Wide Bay Burnett region, comprising the Local Government Areas of Bundaberg Regional Council, Cherbourg Aboriginal Shire Council, Fraser Coast Regional Council, Gympie Regional Council, North Burnett Regional Council and South Burnett Regional Council. Where appropriate, the Plan may look outside of the region to neighbouring regions or individual Councils for benefit of Plan implementation. Neighbouring regions include Southeast Queensland, Central Queensland, and the Darling Downs. The region is show on **Figure 1**.

The population of the Wide Bay Burnett region was reported to be 310,728 in 2021 with a population density of 6.39 persons per square kilometre over a total land area of approximately 48,598 square kilometres.[8] Population is forecast to grow within the region to between 324,778 and 396,515 by 2041[9]. Growth across the region is forecast to be highest in Bundaberg (19%), Fraser Coast (21%), Gympie (15%) and South Burnett (12%) LGAs, with Cherbourg Aboriginal Shire Council to experience modest (6%) growth and North Burnett Regional Council expected to contract marginally by 2%. Land use within the region is predominantly rural, with rural-residential, residential, commercial, and industrial land uses in numerous urban centres and small townships. The main urban centres are Bundaberg, Gayndah, Gympie, Hervey Bay, Kingaroy, and Maryborough alongside the aboriginal community at Cherbourg.

The Wide Bay Burnett Region's Gross Regional Product is estimated at $14.19 billion, which represents approximately 3.79% of the state's Gross State Product (GSP)[10] and contributes 109,360 local jobs. The largest industry by employment is health care and social assistance. Rural land within the region is used largely for forestry, agriculture, and horticulture, particularly sugar cane, fruit, vegetable, cereal, and crop growing and cattle grazing. Tourism and the resources industry are also important contributors to the economy.

Several key projects are identified within the region which, when developed will contribute both to regional growth and potentially expansion of waste generated within the region including the manufacturing of new trains and associated supply chain in Maryborough, the Wide Bay Burnett minerals region activation, activities at the Port of Bundaberg and State Development Area, and facilitation to support the growth of food and beverage manufacturing. These are supported by the Queensland Government Department of State Development, Infrastructure, Local Government and Planning (DSDILGP).[11]

[8] Regional Development Australia, Wide Bay Burnett, 2023. RDA Wide Bay Burnett Region – Community Profile
[9] Queensland Government population projections, 2018 edition; Australian Bureau of Statistics, Population by age and sex, regions of Australia, 2016 (Cat no. 3235.0).
[10] Regional Development Australia, Wide Bay Burnett, 2023. RDA Wide Bay Burnett Region – Economic Profile https://economy.id.com.au/rda-wide-bay-burnett
[11] State of Queensland, 2023. Strengthening Wide Bay Burnett,



0 25 50 km

Major Roads

Wide Bay Burnett Plan Region

Coordinate System:	GDA 1994 MGA Zone 56
Scale:	1:1,700,000 at A4
Project Number:	620.31107
Date:	22-Nov-2022
Drawn by:	JG

SLR

Data Sources:
QLD DoR Spatial Catalogu, ESRI Basemap World Light Gray Canvas Base

WIDE BAY BURNETT RWMP REGIONAL WASTE MANAGEMENT PLAN

General Location

FIGURE 1

\\au.slr.local\Corporate\Projects-SLR\620-BNE\620.31107.00000 Wide Bay Burnett RWMP\06 SLR Data\01 CADGIS\GIS\620.31107 General Location.mxd

1.3 Key issues to be addressed

Through an Investment Logic Mapping (ILM) process with WBB councils, elected officials and key plan stakeholders including the Queensland Government, the following needs for the plan to address (service needs) were identified:

- Some landfills in the region are approaching capacity, which will prohibit further landfilling and require further diverse investment to enable management of residual waste
- Individual councils do not have sufficient scale for processing and remanufacturing recyclable materials or residual waste, limiting the ability to achieve resource recovery at a commercial scale
- There are insufficient current local end markets for recycled materials and/or secondary raw materials, with the exception of recycled organic waste, generally limiting the ability to achieve commercial rates of return for resource recovery
- A lack of community understanding around the increasing cost of waste management and absence of incentives and benefits for households to improve behaviours is leading to inefficient waste management practices.
- There is an opportunity to develop and support new industries and create local economic and community benefits through collaborative waste management planning between WBB councils and outside the region.
- The objectives and targets in the Queensland Waste Management and Resource Recovery Strategy and National Waste Policy Action Plan cannot be met in the Wide Bay Burnett Region with existing infrastructure, initiatives, funding, resourcing, and supporting policy.

These key issues are explored further in **Section 3**.

1.4 Approach to plan development

This Plan has been developed through initial engagement between WBB Councils, the Queensland Government, and other key stakeholders. Engagement to inform this interim report has included:

- An investment logic mapping workshop with the WBB Resource Recovery Working Group including representatives from each member council and the Queensland Government.
- An options assessment workshop considering the key options available to councils as part of a regional collaboration or for individual council action with the WBB Resource Recovery Working Group including representatives from each member council and the Queensland Government.
- An implementation options workshop with the WBB Resource Recovery Working Group including representatives from each member council and the Queensland Government to identify roles and responsibilities, governance structures, funding needs and timeframes.
- A cost benefit analysis undertaken on major sub-regional scale solutions (Appendix A).
- A series of follow up sessions with individual councils to refine and improve on the understanding of workshop outcomes, capturing specific needs or to undertake editorial.
- Presentations to a working group comprised of elected representatives and waste officers from WBB Councils specifically to develop this Plan
- Presentations to individual Councils to update on scope, progress and overall outcomes as related to their specific Local Government Area.

- Additional follow up sessions with council teams and Department of Environment and Science (DES) relating to information and data provided to inform waste flow forecasting.
- Engagement with key non-Council or Queensland Government stakeholders in the region including peak bodies, local industry and other specialist businesses managing materials or waste.

1.5 Document map

This Plan is the result of a significant research, consultation, and collaboration effort by council representatives across the WBB region and draws together work undertaken by individual councils within the region. Key information utilised is referenced in the document. The following provides a document map to where information is presented:

Table 1 Document map

Detail	Section	Sub-section	Description / Relevance to Plan
Purpose of the RWRRP	1	1.1	The rationale and expected objectives of the Plan
Background information	1	1.2	Information on the Wide Bay Burnett Region
Policy setting	2	2.1, 2.2	The current policy setting in which this Plan is developed including approach to regional collaboration
Waste arisings, current baseline, and forecasting	2	2.4, 2.6	Analysis relating existing waste arisings in the region, current management, and processing infrastructure, and forecast arisings utilised to shape the plan.
Key issues & opportunities	3	1.3, 3.1-3.6	Description of strategic rationale and detail of key issues identified by stakeholders to be addressed by the Plan
Organic waste stream	4	Whole section	This section considers the role the region will play in diverting organic waste from landfill, whether by large scale intervention or community based non-infrastructure solutions, including estimated cost of the transition and role each Council will play.
Material recycling & recovery	5	Whole section	This section considers how material recycling and recovery can be improved in the region, including reducing contamination, improving transfer and segregation facilities, and identifying collaborative actions for MRF and precinct development.
Residual waste stream	6	Whole section	Following implementation of the outcomes of s4 and s5 this section considers how the residual waste stream will be managed in the context of reducing airspace and increasing cost for landfill disposal.
Plan implementation	7	Whole section	This section presents how the plan will be implemented, including key actions and agreements for collaboration, how the plan will be delivered, and where funding may make the impact on households lower or more meaningful.

1.6 Assumptions and limitations in preparing this Plan

The following assumptions and limitations have been used to develop this Plan:

- Data provided by the Queensland Government from annual returns is assumed to be free from errors. The data cut off allows the utilisation of data up to FY20-21 to inform the study. In some cases, Councils have provided additional data to supplement or reflect their own analysis, which may be inconsistent with the Queensland Government supplied data.
- Cost estimates provided in the cost benefit analysis and presented in the Plan are accurate at a p50 level. These estimates are built using proxy costs in the region (where available), from out of region or from benchmark data. It is a general assumption that any costed solution will require further definition during implementation of the Plan and to satisfy the needs of Local, Queensland and Commonwealth Government decision makers.
- The waste sector is highly dynamic. Over the duration of the Plan development changes have been captured, however the Plan should be reviewed on a regular basis during implementation to ensure it meets the needs of the current policy position.
- This Plan represents the inputs and requirements of Councils developed through an interactive process. Whilst decisions reflected in the Plan are current at the point of issue, these decisions require continued council involvement, authorisation, and funding (whether from Councils or other funding sources) to progress towards the targets and outcomes.
- This Plan identifies the pathway and the evidence base for the region to deliver on the objectives of Queensland's Waste Management and Resource Recovery Strategy, including suggested actions and costs to implement.

2 Existing Information

2.1 Policy & legislative drivers

The Plan is not prepared in isolation. There are a range of economic, environmental, policy and legislative factors that drive the need for a regional-scale response. The key policy and legislative drivers are:

2.1.1 National policy and legislation

The **National Waste Policy**, which was updated in 2018, and the **National Waste Policy Action Plan**, identify priority wastes and prioritises the increased diversion of organic waste from landfill. Under the policy, and the introduction of the *Recycling and Waste Reduction Act* 2020, a framework for the banning of export of certain waste materials (glass, plastic, tyres and paper and card). Reprocessers can now only export these materials under specific requirements[12], with a view to driving in Australia processing and remanufacturing. Support for the waste industry is provided by a partnership between the Commonwealth and State Governments under the Recycling Modernisation Fund. In relevance to this Plan, export bans provide a barrier to existing Material Recovery Facility (MRF) operators and likely, over time will lead to increased gate fees for users of these facilities (e.g., Councils who provide kerbside collected commingled recycling), particularly whilst onshore processing and secondary markets utilising the recycled material are catching up.

Under the National Waste Policy, the Commonwealth Government has initiated the **Ministers Priority List**[13]. This is a list of priority wastes and actions updated annually, with an aim to driving action through product stewardship to manage problematic or emerging wastes. From this list product stewardship schemes for photovoltaic (PV) systems (i.e., solar panels), electrical and electronic products (e-wastes), plastic oil containers, child car seats, clothing and textiles, and problematic and unnecessary single use plastics have been established or are in the process of being established. A series of national product stewardship schemes are established for oil, TVs and computers, plastics and packaging, mattresses, mobile phones, tyres, large plastic bags, batteries, aluminium cladding under mandatory schemes, co-regulatory arrangements, or government accredited industry-led voluntary schemes. In regional Queensland access to residents, whether directly or via Council operated resource recovery or transfer facilities can be variable.

2.1.2 Queensland policy and legislative environment

The Queensland Government's ***Waste Management and Resource Recovery Strategy*** (WMRR Strategy), released in 2019 provides a framework and series of actions for the Queensland Government, Local Government, and industry to move toward a Zero Waste Society by 2050. The state is required to have a waste management strategy under the *Waste and Recycling Act* 2008. The development of this Plan is an action under the Strategy, which sets specific resource recovery targets for 2025, 2030, 2040 and 2050. To support the implementation of the Strategy, the Queensland Government commenced a levy on the disposal of waste to landfill in 2019. The implication of this on this Plan is presented in Section 2.1.3. Under the strategy a series of action Plans and policies have been developed or are in progress.

[12] The regulation of export of paper and card will commence on 1 July 2024. Glass, plastic, and tyres are already regulated.
[13] Australian Government, 2022. Minister's Priority List, from https://www.dcceew.gov.au/environment/protection/waste/product-stewardship/ministers-priority-list

The Queensland WMRR Strategy points towards a **transition towards a circular economy**. Whilst the waste hierarchy and the traditional 3Rs of Reuse, Recycling and Recovery continue to dominate how waste is managed in the region, and will continue to do so, it is reasonable to expect over time the nature of waste will change as producers and consumers begin to adopt circular concepts. The 10Rs of the circular economy place (see **Figure 2**) a much greater emphasis on the use of design for consumers and producers to refuse, rethink and reduce waste. Consumption under the circular economy will support reuse, repair, refurbishment, remanufacturing, and repurposing to minimise the return of materials for recycle or recovery. This Plan attempts to find a balance between meeting existing needs and allowing for future changes.

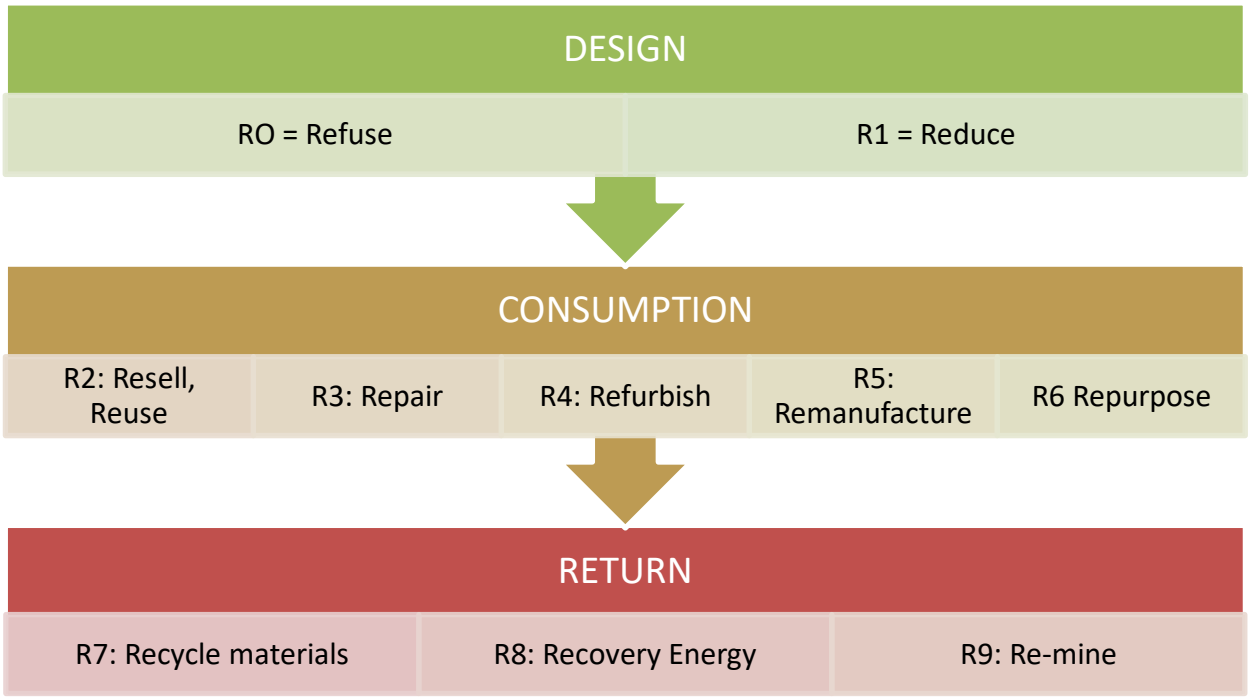


Figure 2 The 10 Rs of a Circular Economy[14]

[14] Vermeulen, W.J.V, Reike, D. and Witjes,S. 2019. Circular Economy 3.0 – Solving confusion around new conceptions of circularity by synthesising and reorganising the 3R's concept into a 10R hierarchy.

Table 2 Summary of relevant State legislation and policy

Document	Status	Relevance to regional Plan
Queensland Waste and Resource Recovery Infrastructure Report	Current	Statewide waste and resource recovery infrastructure report detailing stocks and flows, and locations and capacity of existing waste infrastructure. Used to inform baseline for this Plan
Queensland Resource Recovery Industries 10-Year Roadmap and Action Plan (2019)	Current	Action Plan under Waste Strategy Sets out a Plan to support industry growth and job creation in resource recovery, including framework for grant funding. Interaction with precinct planning provides for beneficial co-location of recycling and post-recycling
First Nation communities waste strategy and Action Plans	Current	Provides an innovative approach for Queensland's 17 Aboriginal and Torres Strait Island Councils in managing waste. Is supported by regional Action Plans, in development, with three Councils included in Regional Waste and Resource Recovery Plan, Palm Island, Woorabinda, Cherbourg
Queensland Energy from Waste Policy (2021)	Current	Non-statutory policy sets framework for role of EfW in Queensland and key performance and compliance indicators. Implications for EfW projects proposed under this Plan, requirements may impact analysis
Queensland Organics Strategy and Action Plan 2022-2032	Current	The Organics Strategy provides the framework and actions for improved management of organic materials across the supply and consumption chain. Regional Planning must be consistent with the Strategy aims and objectives and allow for the impact of the successful implementation in forward projections. The Action Plan provides specific actions for delivery across the avoidance, landfill diversion and recycling themes in the short, medium, and long term. The regional Plan will seek to contribute to these actions to support the Queensland Government in achieving the objectives of the strategy.
Queensland Plastic Pollution Reduction Plan	Current	Presents the strategy for how Queensland will be part of the solution to plastic pollution, including prioritised actions along every step in the supply chain. Implementation of the strategy has included the ban on sale or supply of single-use plastic items in 2021, with additional bans on other problematic plastics to commence soon. Solutions for improving the management of plastic wastes and moving towards a circular economy delivered under the regional Plan should align with the Plastic Pollution Reduction Plan.
Single-use plastic items ban	Current	Implemented on 10 March 2021, the legislation bans the sale or supply of straws, cutlery, unenclosed bowls and plates, stirrers and expanded polystyrene takeaway food containers and cups. This ban and future bans should be considered when forecasting future supply of waste containers such as compostable packaging.
Plastic bag ban	Current	The ban on the supply of single-use lightweight plastic shopping bags came into effect on 1 July 2018, forming part of broader measures to reduce single use plastic.
Containers for Change – container refund scheme	Current	The current container refund scheme facilitates a 10-cent refund for eligible drink containers at approved container refund points. The availability of recycled material collected through the scheme may be relevant to feedstock supply for certain types of secondary processing, for example, aluminium, plastics, and others. Recently announced consultation on the addition of wine and spirit bottles in late 2022.
Queensland E-Products Action Plan	In development	This plan seeks to address waste avoidance, reduction, reuse, repair, and recycling for electrical and electronic products, collectively known as e-products.
Queensland Textile Waste Action Plan	In development	This plan seeks to address problematic and hard to recycle textile wastes. It may present new pathways or avenues for support to improving recycling.
Landfill Disposal Bans	In development	The Queensland Government is currently undertaking analysis of the potential to implement bans on the disposal of certain types of waste to landfill.
End of waste framework	Current	Framework that allows waste to be used as a resource under certain conditions, including a range of waste types relevant to council operations.

2.1.3 Queensland's Landfill Levy

The Queensland Government introduced a landfill disposal levy in 2019 through amendments to the *Waste Reduction and Recycling Act* 2011. The levy is payable on all waste (including waste generated in another state or territory) disposed to a leviable waste disposal site within the levy zone or if it has been generated within the levy zone and disposed of to a landfill outside the levy zone in Queensland.[15] In the Wide Bay Burnett region, Bundaberg Regional Council, Fraser Coast Regional Council, Gympie Regional Council, North Burnett Regional Council and South Burnett Regional Council were all included within the levy zone. The waste levy does not apply to waste generated in the Cherbourg Aboriginal Shire Council area.

In late 2021 changes to the approach were announced. From 1 July 2022, the levy zone has been divided into two areas:[16]

- the metro zone—comprising 12 south-east Queensland local government areas.
- the regional zone—made up of the remaining 27 local government areas in the current levy zone.

The two zones have different rates. These changes reflect the differences between South-East Queensland and regional areas in terms of waste volumes and opportunities for recycling and resource recovery. The non-levy zone has not changed and as such, there is no change for Cherbourg Aboriginal Shire Council.

From commencement in 2019, 105% of the levy collected on household waste (the MSW stream) disposed of to landfill was returned to levied councils via annual advanced payments to meet the Queensland Government commitment of no direct impact on households.[15] The changes announced in late 2021 also have an implication on councils within the Wide Bay Burnett Region, in particular for Bundaberg Regional Council and Fraser Coast Regional Council, as outlined in the table below.

Table 3 Announced changes to annual advanced payment proportions

Council	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30	2030-31
Bundaberg Regional Council	105%	95%	85%	70%	60%	50%	40%	30%	20%
Cherbourg Aboriginal Shire Council	0%	0%	0%	0%	0%	0%	0%	0%	0%
Fraser Coast Regional Council	105%	95%	85%	70%	60%	50%	40%	30%	20%
Gympie Regional Council	105%	100%	100%	100%	100%	100%	100%	100%	100%
North Burnett Regional Council	105%	100%	100%	100%	100%	100%	100%	100%	100%
South Burnett Regional Council	105%	100%	100%	100%	100%	100%	100%	100%	100%

Source: Queensland Government[16]

From 1 July 2023 Gympie Regional Council, North Burnett Regional Council, and South Burnett Regional Council will receive 100% of the annual advanced payment, a reduction from the 105% received up to this point. The annual advanced payments for Bundaberg Regional Council and Fraser Coast Regional Council are different to other councils in the region, with a progressive reduction in the proportion of annual advanced payment received commencing from FY23-24 and reducing to an annual advanced payment of 20% by FY30-31. Four years' worth of payments were made to Queensland Councils at the start of the FY22-23 as summarised in **Table 4** and **Figure 3** below.

[15] State of Queensland, 2022 About Queensland's waste levy | Environment, land and water | Queensland Government (www.qld.gov.au)
[16] State of Queensland, 2022 Waste levy changes from 1 July 2022 | Environment, land and water | Queensland Government (www.qld.gov.au)

Table 4 Regulated annual advance payments – FY22-23 to FY25-26

Council	2022-23	2023-24	2024-25	2025-26	Four-year total
Bundaberg Regional Council	$3,723,443	$3,428,137	$3,168,400	$2,720,303	$13,040,283
Cherbourg Aboriginal Shire Council	$ -	$ -	$ -	$ -	$ -
Fraser Coast Regional Council	$3,946,415	$3,581,532	$3,310,172	$2,842,025	$13,680,144
Gympie Regional Council	$1,742,893	$1,639,022	$1,693,055	$1,765,100	$6,840,070
North Burnett Regional Council	$404,232	$422,550	$436,481	$455,054	$1,718,317
South Burnett Regional Council	$1,420,778	$1,365,692	$1,410,715	$1,470,746	$5,667,931

Source: as per Waste Reduction and Recycling Regulation, Schedule 4A

Beyond FY25-26 the regulated amounts of annual advanced payment have not been published; however, it is assumed they are based upon the same base year for calculating annual advanced payments through to FY30-31. Over this four-year period there may be changes to the amount of household waste that goes to landfill within some Councils. Based on current arisings, the regulated annual advanced payments have been extrapolated out based on the proposed changes to the annual advanced payments. Waste arisings are expected to be different to the base year, so there may be some variation across all councils.

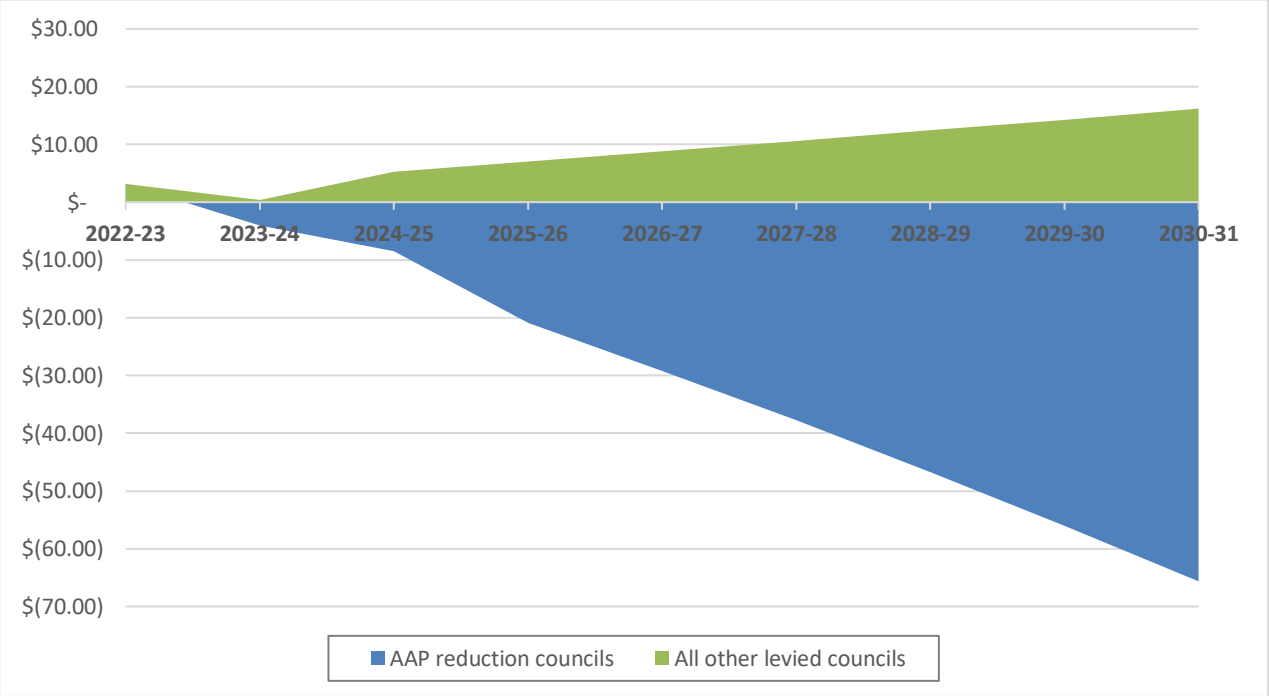
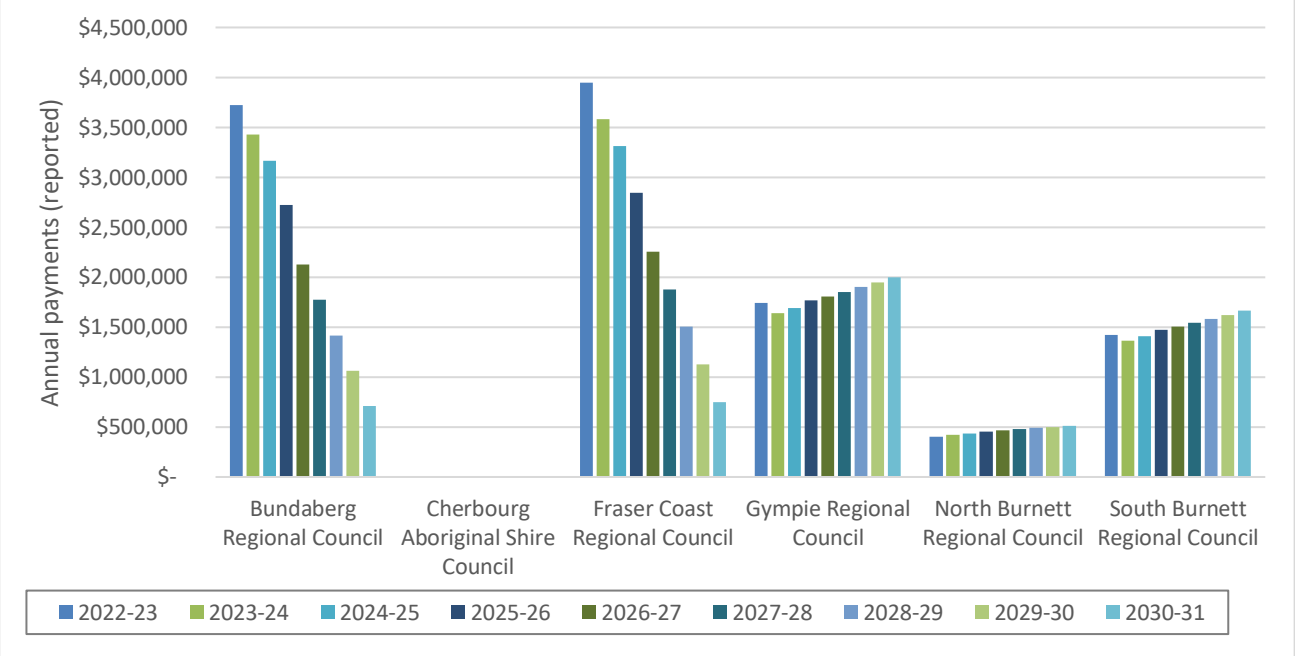


Figure 3 Impact of differential in annual advanced payment ($/tonne)

For Bundaberg Regional Council over the period FY22-23 to FY30-31 it is estimated, based on forecasting to inform this Plan, that the cost of the landfill levy without any intervention would be $36 million. Bundaberg Regional Council estimates a shortfall between the levy cost and the amount received from annual advance payments of $21.6M over the next 8-years.

For Fraser Coast Regional Council over the period FY22-23 to FY30-31 the estimated cost of the landfill levy without any action is around $33 million. Over the same period Fraser Coast Regional Council will receive an estimated $21.5 million in annual advanced payments, leaving a shortfall of an estimated $20 million over 9 years. There may be some uncertainty beyond the 4-year reported annual advanced payments, including the ability for councils to receive higher payments to bridge the gap between forecast arisings and actuals.

The estimated cost impact is shown on **Figure 4**.



Note: Bundaberg and Fraser extrapolated based upon FY22-23 at 105% estimated based on current data. Other Councils assumed to receive 100% over duration with annual advanced payment increasing by generalised CPI of 1.9%

Figure 4 Change in annual advanced payments – Wide Bay Burnett Councils

2.1.4 Queensland's Resource Recovery 10-year Roadmap and Action Plan

The Queensland Resource Recovery 10-year Roadmap and Action Plan was released in 2019 following the release of the WMRR Strategy. As a key action plan under the Strategy, the Roadmap and Action Plan intends to support industry growth and job creation in resource recovery industries over the 10-year plan period. The Roadmap and Action Plan targets the acceleration of project pipelines, market and supply chain development, updates specifically, where required, to the planning framework and supporting the advancement of new and emerging technologies.

Under the Roadmap and Action Plan funding has been provided to support the establishment of businesses and local government through the establishment of:

- The Resource Recovery Development Program (RRIDP) provided funding support to an additional $193.8 million of capital investment creating more than 360 jobs across Queensland and diverting 1.3 million tonnes of waste per annum from landfill. Within the region, funding was granted for:
    - Upgrade of the existing material recovery facility operated by Cleanaway Pty Ltd at Dundowran, Hervey Bay, within the Fraser Coast Regional Council area
    - The establishment of a construction and demolition waste processing centre by Horne Group Pty Ltd at Hervey Bay.

  - To support a late-stage engineering report for Laminex looking at the potential for a cogeneration plant in Gympie.

- The Queensland Recycling Modernisation Fund (QRMF) – co funded $20 million from the Commonwealth Government and $20 million from the Queensland Government for investment to support sorting, processing, recycling, or manufacturing of waste and divert wastepaper and cardboard, plastic, tyres, or glass from landfill. This fund is now closed.
- The Regional and Remote Recycling Modernisation Fund (RRRMF) – provides grants of up to $500,000 for local governments, and their industry partners, to improve the viability of sorting, processing, recycling, or remanufacturing of waste in regional and remote Queensland. Funding is available for infrastructure projects that divert waste plastics, mixed and unsorted paper and cardboard, unprocessed glass, or whole used tyres from landfill in regional and remote areas of Queensland. This fund is now closed to new applications.
- Industry Partnership Program – this $350M program will invest in several priority industry sectors including resource recovery including financial and non-financial incentives or assistance packages. This program may be accessed to support implementation of this plan.
- The $1.1 billion Recycling and Jobs Fund announced late in 2021 seeks to deliver more opportunities for businesses and industry as resource recovery infrastructure is expanded and new markets for waste material are developed. A portion of this will be administered under the Roadmap and Action Plan.

2.1.5 Recycling Enterprise Precinct Development

Under Queensland's Resource Recovery 10-year Roadmap and Action Plan a key action was the development of enterprise recycling precincts. The Department of State Development, Local Government, Infrastructure and Planning (DSDLGIP) has undertaken a series of workshops during 2022 with the aim of engaging with local stakeholders, including local government and industry to identify opportunities and challenges, gain insight into how to progress and how the states approach to developing precincts for resource recovery and secondary processing can support local growth and existing initiatives. The expected outcomes of the workshops is the collation of feedback as well as the development of guidelines for precinct development and specific location strategies to be applied across Queensland.

A workshop was held in Bundaberg in August 2022[17]. During the workshop it was identified that:

- Wastes requiring most attention in the region were organic wastes including green wastes, sugar cane waste, timber waste, and food wastes. Other key wastes identified included agricultural plastics, mattresses, soft plastics, batteries, tyres, e-waste, cardboard, agricultural chemicals, and paint products.
- A precinct does not exist in the region. Transport infrastructure was identified as a critical element in addition to transport costs. The Port of Bundaberg State Development Area was identified as being able to support coastal shipping for end products which was supportable by the rail network.
- There was strong support for a hub-and-spoke approach to precinct development, with a larger precinct envisaged in one location with smaller "spokes" in other regional centres. Location close to existing facilities was considered desirable. There was also strong support biofuels and remanufacturing of agricultural plastics back into agricultural products or food grade plastics to be explored.

Two guiding documents have been released by the Queensland Government complementary to this Plan:

[17] E3 Advisory, 2022. Resource Recovery Precincts, Regional Forum Report, Bundaberg 3 August 2022

- Recycling Enterprise Precincts: A "How To" Guideline[18] – this document provides practical information to assist proponents seeking to establish a precinct including key actions, activities and matters to consider.
- Recycling Enterprise Precinct Location Strategy[19] – this document presents guidance on potential locations for the establishment of a network of Recycling Enterprise Precincts across Queensland to maximise locational opportunities for industry development and recovered materials-based activities.

2.1.6 Queensland's Organic Waste Strategy and Roadmap

Queensland's Organic Waste Strategy and Roadmap provides a series of actions and outcomes that are directly relevant to this Plan.

Table 5 Organic Waste Strategy and Roadmap targets relevant to this Plan

Ref	Title	Detail & relevance
A1	Halve the amount of food waste generated	Utilising existing programs provide materials to Queensland Councils with dedicated education officers to assist deliver messaging. Targeting a 10% reduction in household food waste in the residual waste bin by 2025.
A2	Understand food waste behaviours in Queensland	Design effective interventions for state-wide and targeted messaging.
A3	Commence education for future generations	Develop materials and deliver food waste education materials as part of sustainability curriculum to reach 80% of Queensland schools by 2030.
A11	Lead by example at Government events	Driving food waste avoidance through action at State and Local Government events.
D1	Review fit for purpose solutions	Local governments are required to conduct a business case to identify the best fit-for-purpose option to improve household organic waste management in their local government area, including consideration of Food organics, Vegetable Organics, Garden Organics or combined Food and Garden Organics systems; or to implement small scale solutions to process organics such as through community composting hubs or encouraging home-based approaches for organics processing (e.g., composting at home, bokashi bins, worm farms etc.,) Specific actions relevant to this plan including funding for additional council trials, this Plan is required to recommend improved organics management options by 30 June 2023, and 75% of councils within the levy zone have business cases for their solutions completed by 30 June 2023.
D2	Implement new household collection options which are consistent from the start	Based on D1 Local Governments are to implement solutions to improve household organic waste management in their LGA. The Queensland Government will provide support to better manage this material in a fit-for-purpose manner, including support for education and behaviour change, for consistency (bin lid colour harmonisation etc.,), to understand and enforce contamination levels, and incorporate sufficient data collection and auditing processes to monitor uptake and contamination levels. Performance measures include improved organics management services in place by 2026 in major regional council areas with 80% of households participating in services within 3 years of a service commencing, plus demonstration of an increase in the volume of organics captured and reprocessed over time.

[18] E3 Advisory, 2022. Recycling Enterprise Precincts, A "How To" Guideline
[19] E3 Advisory, 2022. Recycling Enterprise Precinct Location Strategy

Ref	Title	Detail & relevance
D3	Make the inputs clear	Develop, implement, and align household education and behaviour change tools in partnership with local government and industry to minimise contamination across all household kerbside bins, to maximise organic material being captured in organics bins and minimise contamination. Key metrics are that 65% of households in Queensland will have organics capture services by 2025, and 80% by 2030, with a 90% capture rate for Food and Garden Organics comprising 50% capture of Food Organics, 90% of garden organics and less than 1% contamination rate.
D6	Set a clear end goal	Queensland Government looking at the potential feasibility and options associated with undertaking landfill disposal bans for organic wastes, with a feasibility assessment to be completed by the end of 2022, with a view to progressive bans starting in South-East Queensland by around 2025. No information has been provided on this.

2.2 Regional collaboration

There is no formal collaboration in the region on waste and resource recovery issues, and no formal overarching local government collaboration structure. There is collaboration between councils on an informal basis. To support the co-development of this Plan Councils have agreed to collaborate. An expected outcome of the Plan is to provide a template for future regional collaboration on waste and resource recovery issues.

The WBB region RRWG has prepared several region-specific reports, feasibility studies and business cases which provide a high level of detail to support this plan. Involvement by Council decision makers is high, which gives legitimacy to the decisions made by each council in supporting the group, which in turn supports ownership of this plan. Several council specific documents are also available and utilised to inform this Plan.

Table 6 Regional strategy documents

Document	Status	Relevance to regional plan
Regional Strategy Documents		
Wide Bay Burnett Regional Organisation of Councils Waste Strategy 2015-2020	Released 2015 however ROC disbanded in 2021	• Seeks to minimise waste to landfill, maximise the potential of waste as a resource and explores innovative solutions in management, resource recovery and recycling of waste. • Provides short-, medium- and long-term actions and goals over the term of the five-year strategy. • Outlines population trends, waste data and projections, waste reduction and recycling goals and targets, and details strategic goals and targets.
Key documents for member Councils		
Bundaberg Regional Council Waste Management and Resource Recovery Strategy 2017-2025	Current	• The first waste management strategy developed for Bundaberg Regional Council • Details current facilities, services, and regional profile • Addresses waste avoidance, collection, treatment, resource recovery, final disposal, and remediation of site for post closure
Cherbourg Aboriginal Shire Council, Corporate Plan 2020-2025	Current	• Identifies waste management within the corporate plan, in particular maintenance of the existing waste management facility to an acceptable standard as an objective to develop and maintain a healthy living environment for the community and maintaining essential infrastructure for the community.

Document	Status	Relevance to regional plan
Fraser Coast Waste Strategy 2019-2029	Current	• Sets a clear path for the management of solid waste in the Fraser Coast region towards 2029. • Builds on the success of the Waste Management & Resource Recovery Strategy 2013- 2020 • Focus on resource leadership to deliver the greatest benefits to the local community in terms of resource recovery, environmental amenity, and economic development.
Gympie Regional Council, Regional Waste Management Strategy 2013-2020	Current (on GRC website)	• Prepared in 2013 so pre-landfill levy and current Queensland WMRR Strategy. Sets objectives, strategy development including levels of service required, and details around collection services for MSW, C&I and C&D within the region. • Presents a strategy implementation plan. • Presents records of consultation.
North Burnett Regional Council Waste Reduction and Recycling Plan 2021-2026	Current	• Sets out waste reduction and recycling target and recommends actions to improve waste reduction and recycling. • Details current and proposed waste infrastructure • Discusses the performance of local government in terms of management and monitoring. • Promotes continuous improvement
South Burnett Regional Council Waste Management Strategy 2015-2022	Current	• Provides overarching vision, objectives, and strategy framework for regional strategy. • Presents goals, level of service, waste reduction and resource recovery and infrastructure/network planning • Sets out measures for implementation of the waste hierarchy, strategy implementation and consultation undertaken.

At an individual council level all councils have undertaken an element of development of plans, typically around remaining capacity of existing facilities, potential options, and feasibility studies. In some cases, these have been extended into forward plans. The findings of these reports have been incorporated into the analysis undertaken to develop this Plan.

2.3 Existing services

Waste services provided by Wide Bay Burnett Councils are variable (see **Table 7**). All Councils provide a weekly residual or red lidded bin collection available to most households. Bundaberg, Fraser Coast, Gympie, and South Burnett offer a fortnightly commingled recycling bin collection, and only Cherbourg Aboriginal currently offers a kerbside weekly recycling bin collection. Self-haul to transfer station options are available across all Councils except Cherbourg Aboriginal Shire Council, with weekly bulky waste collections operated by Cherbourg Aboriginal Shire Council.

Table 7 Existing Services by Council

Council	Residual Waste	Recycling	Garden Organics	Bulky Waste
Bundaberg Regional Council	Weekly, 240L	Fortnightly, 240L	Self-Haul only	No kerbside service, transfer station drop-off
Cherbourg Aboriginal Shire Council	Weekly, 240L	Weekly, 240L	None	Weekly, 240L
Fraser Coast Regional Council	Weekly, 240L	Fortnightly, 240L	Self-Haul only	No kerbside service, transfer station drop-off
Gympie Regional Council	Weekly, 240L	Fortnightly, 240L	Self-Haul only	No kerbside service, transfer station drop-off
North Burnett Regional Council	Weekly, 240L	Self-haul only	Self-Haul only	No kerbside service, transfer station drop-off
South Burnett Regional Council	Weekly, 240L	Fortnightly, 240L	Self-Haul only	No kerbside service, transfer station drop-off

In addition to the Container Refund Scheme eligible materials captured through kerbside recycling, each LGA has at least container refund point to allow residents to participate in the state's container refund scheme, Containers for Change, as shown in **Table 8**.

Table 8 Container refund points

Local Government Area	Number of Container Refund Points	Commentary
Bundaberg Regional Council	7	Located at Childers (1), Qunaba (1), Bundaberg (3), Moore Park Beach (1), Burnett Heads (1)
Cherbourg Aboriginal Shire Council	1	1 Facility located in Cherbourg. Cherbourg Aboriginal Shire Council operate 4 further return points in South Burnett.
Fraser Coast Regional Council	13	Glenwood (1), Tiaro (1), Maryborough (2), Howard (1), Hervey Bay (8),
Gympie Regional Council	7	Gympie (3), Tin Can Bay (2), Rainbow Beach (1), Kilkivan (1)
North Burnett Regional Council	5	Biggenden (1), Gayndah (1), Mundubbera (1), Eidsvold (1), Mulgildie (1)
South Burnett Regional Council	4	Kingaroy (1), Nanango (1), Yarraman (1), Blackbutt (1)

2.4 Current performance

2.4.1 Overall waste managed

The total waste received at sites managed by or under contract to Wide Bay Burnett Councils in the 2020-2021 financial years was 461,269 tonnes. This includes kerbside MSW and self-hauled MSW, C&I and C&D waste streams as reported in the Queensland Waste Data Survey (QWDS). A further 46,300 tonnes of waste has been identified in the region as managed by the private sector. A breakdown of the regional waste by stream, and service type, residual, recycling, and organics, is shown in **Figure 5.**

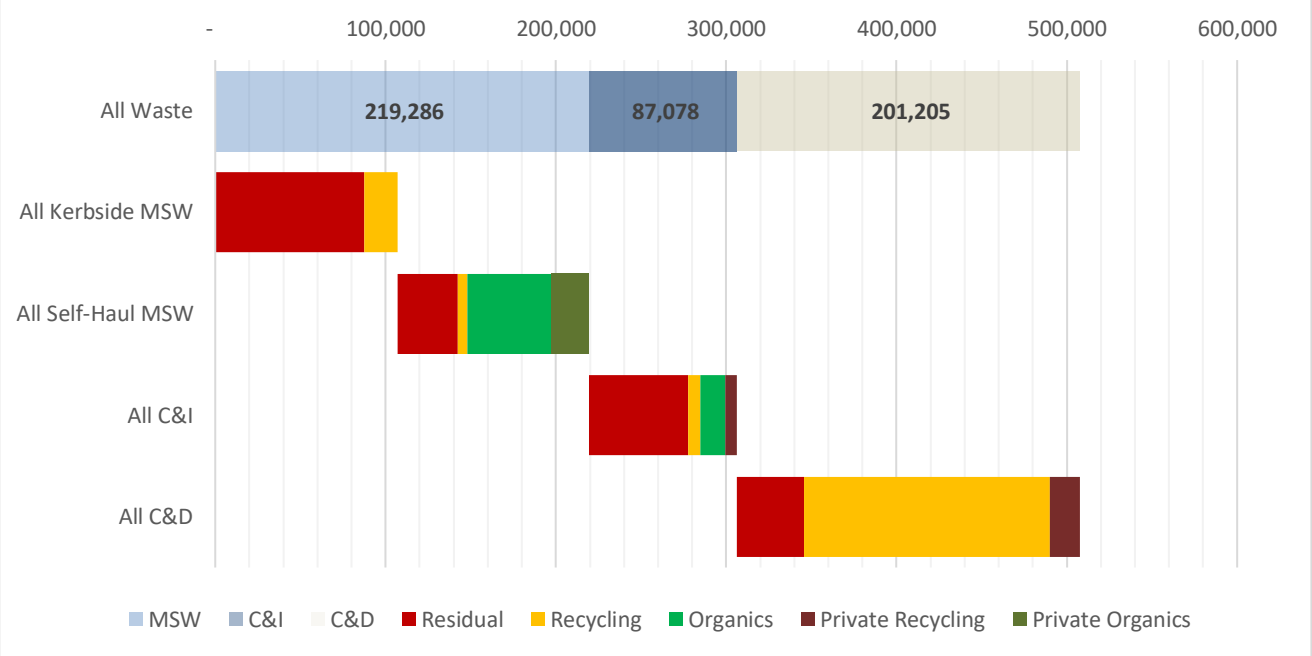


Figure 5 Regional waste summary by stream (tonnes, 2020/21)

A further 2,458 tonnes of other Council waste was recorded, including litter, street sweepings and public place waste. During the same period, no disaster waste was recorded, noting this can be variable depending on the nature of disasters. Biosolids totalled 3,822 tonnes reported as being disposed of to landfill during the period, however it is noted this data does not include biosolids deployed under the end of waste code under land application as the Queensland Government does not collect this data.

Table 9 provides a breakdown of the contribution of each council to the total regional waste quantities. Waste generated is dominated by the larger councils of Bundaberg Regional Council and Fraser Coast Regional Council, with smaller contributions from the others. At a regional scale the contribution of Cherbourg Aboriginal Shire Council is approximately 0.1%.

Table 9 Distribution of waste across the Wide Bay Burnett region

Council	Percentage of Regional Waste by Tonnes
Bundaberg Regional Council	42%
Cherbourg Aboriginal Shire Council	<1%
Fraser Coast Regional Council	36%
Gympie Regional Council	9%
North Burnett Regional Council	4%
South Burnett Regional Council	9%

2.4.2 Breakdown of waste arisings in Wide Bay Burnett

Figure 6 is a waste flow diagram showing the fates by waste stream and the material types managed by Councils in the region. The materials represent what has been reported through QWDS, additional private sector information provided, and with a reference composition applied to kerbside waste and self-haul waste.

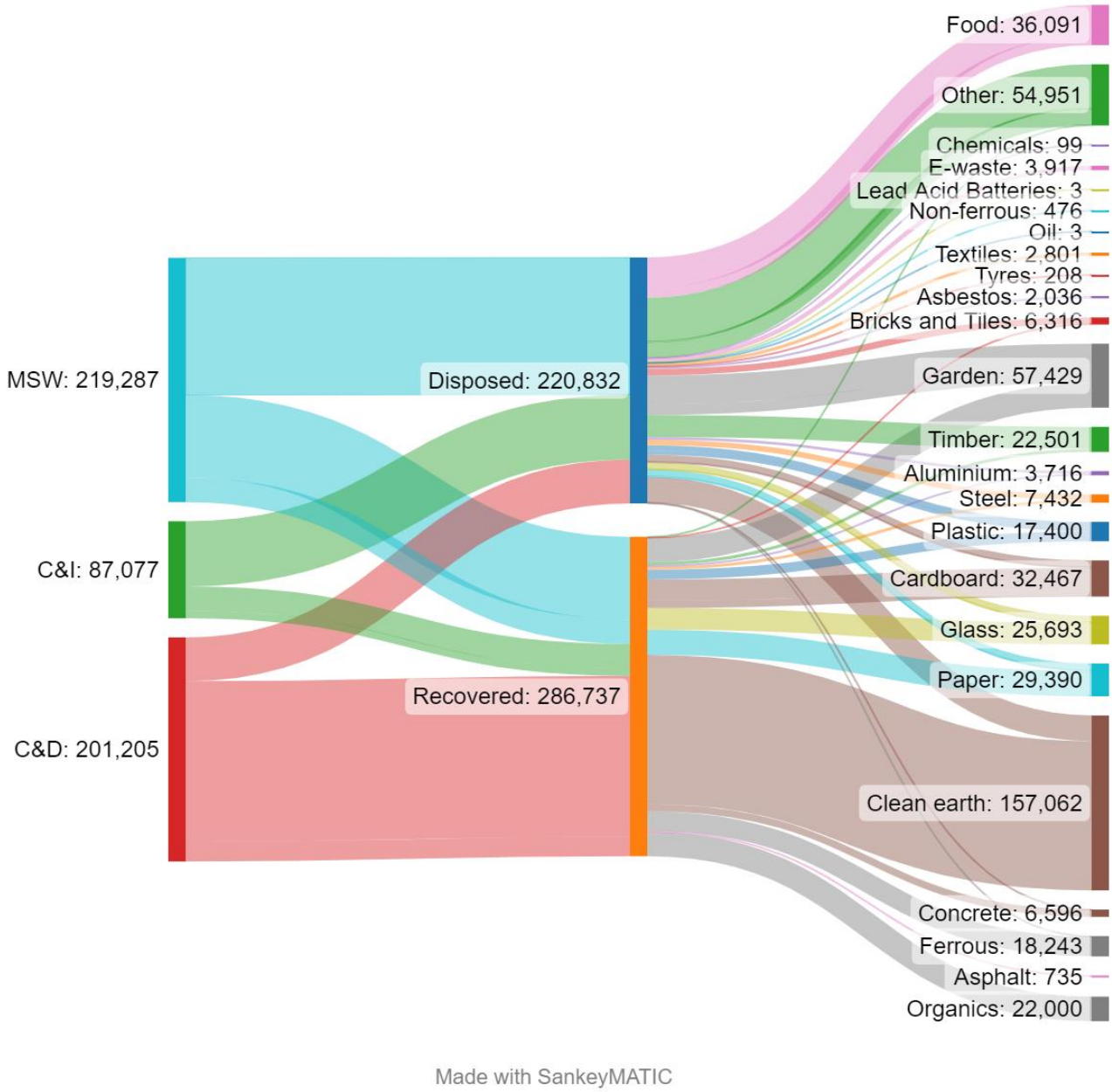


Figure 6 Summary of fates by stream and material for the Wide Bay Burnett region

A breakdown of all waste materials collected across the region is provided in **Figure 7** and shows the relative quantities that are recovered or disposed.

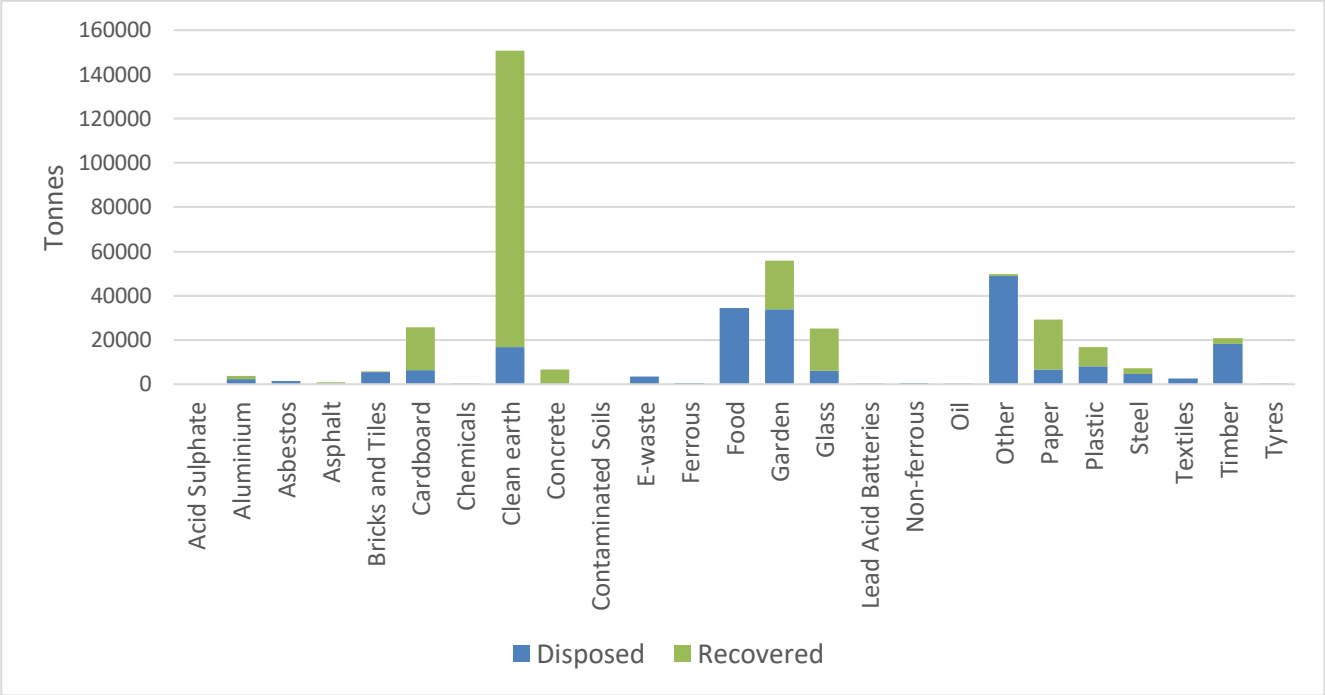


Figure 7 Waste materials by fate for the Wide Bay Burnett Region

The resource recovery potential of different materials can be observed in **Figure 7** with obvious opportunities for food and garden organic waste, plastic, timber and bricks and tiles, plus potential opportunities for e-waste and textiles that may currently go to landfill but for which the Queensland Government is currently developing Action Plans for.

2.4.3 Current resource recovery performance

Table 10 and **Figure 8** detail the Wide Bay Burnett regions' performance in comparison to the Queensland average and targets. The region has a current recovery rate of 52% across all streams, compared to a current state average of 52% and 2025 state target of 65%. The MSW and C&D streams are consistent with the state average, whilst the C&I stream is performing poorly. Across all streams except C&D, the 2025 and 2030 targets are however challenging without intervention,

Table 10 Wide Bay Burnett regional waste diversion target comparison

Waste Type	Diversion from landfill targets			
	WBB (FY20/21)	State average (current)	State target 2025	State target 2030
Combined waste (all categories)	52%	52%	65%	80%
MSW	38%	27%	55%	70%
C&I	29%	50%	65%	80%
C&D	83%	78%	75%	85%

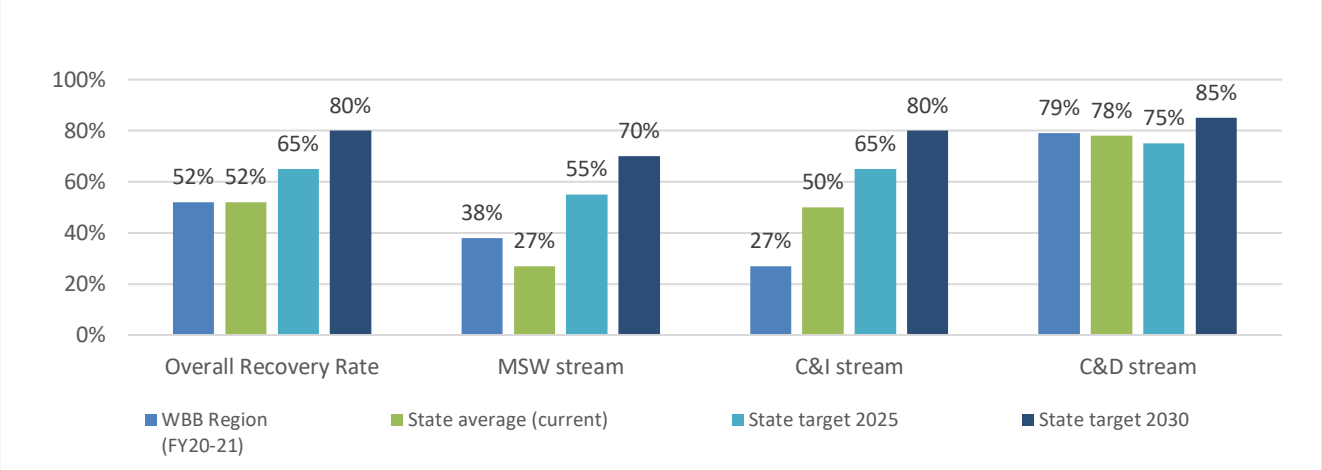


Figure 8 Current performance compared to state and 2025/2030 targets

2.5 Existing infrastructure

To accommodate all other potential destinations, waste can be broken down by materials. **Figure 9** shows the range of separate material streams reported, or where compositional data is known, and their destination. Infrastructure locations are shown on **Figure 10**.

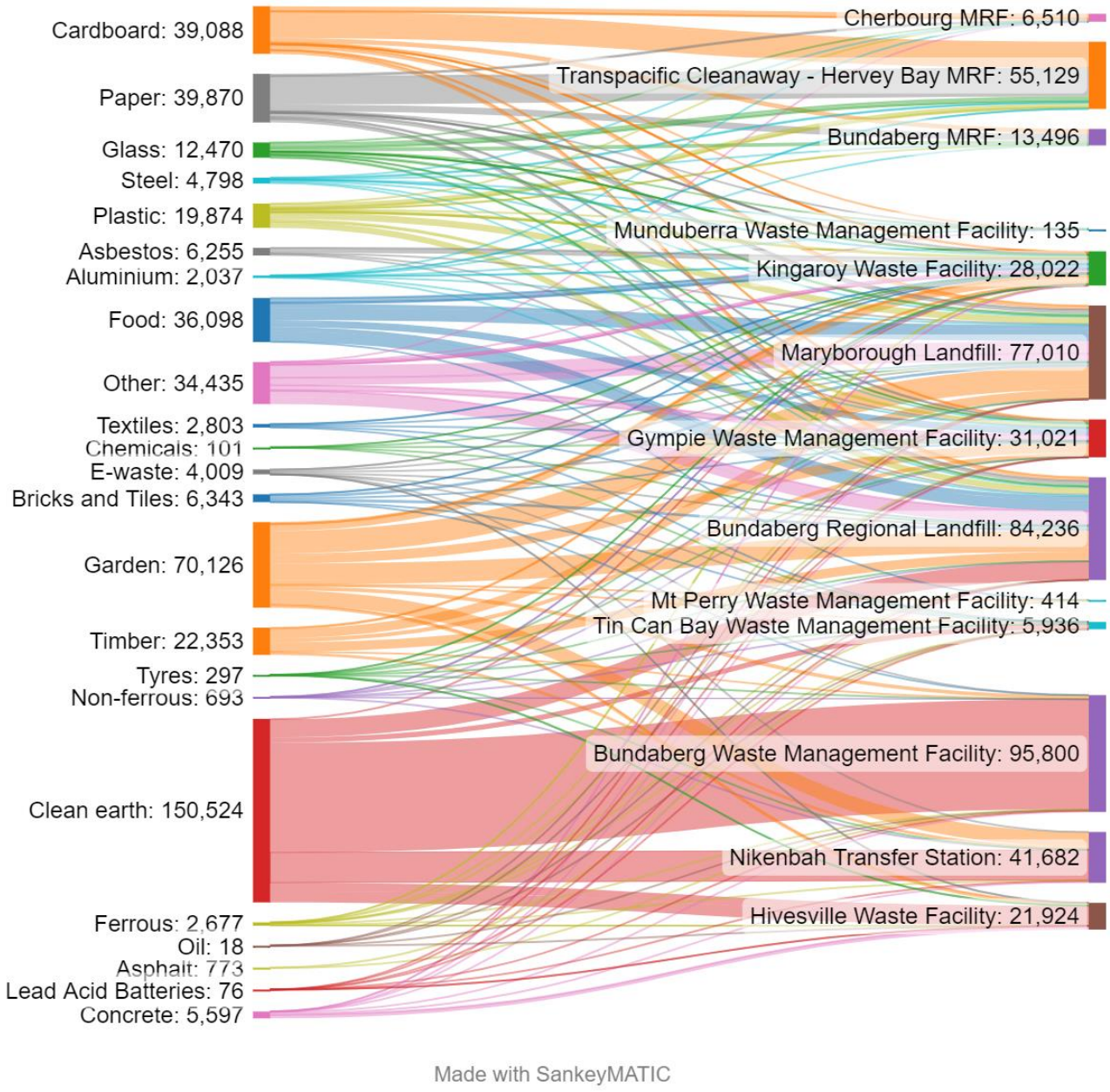
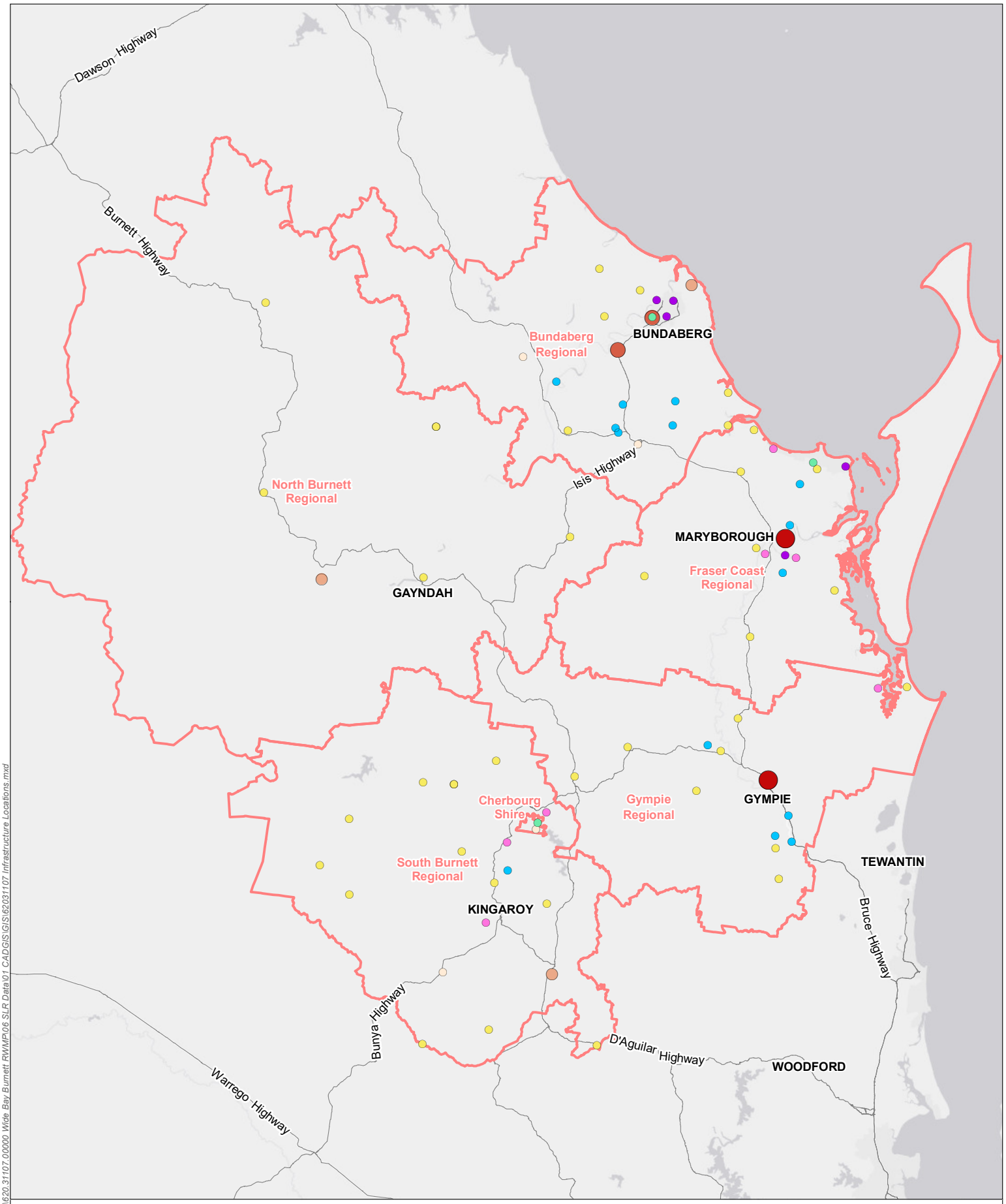


Figure 9 Current waste flow mapping by materials and destination for Wide Bay Burnett[20]

[20] Note end fate does not necessarily reflect final management point, however, is as reported in the QWDS data



0 25 50 km

Coordinate System:	GDA 1994 MGA Zone 56
Scale:	1:1,500,000 at A4
Project Number:	620.31107
Date:	22-Nov-2022
Drawn by:	JG

Wide Bay Burnett Plan Region

Landfill

- Very Small / Remote
- Small
- Medium
- Large

Other Categories

- Landfill / Transfer Station
- Organics
- Recycling
- Recycling - MRF
- Transfer Station

WIDE BAY BURNETT RWMP REGIONAL WASTE MANAGEMENT PLAN

Infrastructure Locations

Data Sources:
QLD DoR Spatial Catalogu, ESRI Basemap World Light Gray Canvas Base

FIGURE 9

2.6 Forecast waste arisings

2.6.1 Regional waste growth projection

Figure 11 provides a 30-year summary of regional waste projections for waste management by councils by waste stream. Without intervention, total waste generation is expected to increase to 545,000 tonnes in FY30-31, 582,000 tonnes in FY40-41 and 618,000 tonnes in FY50-51.

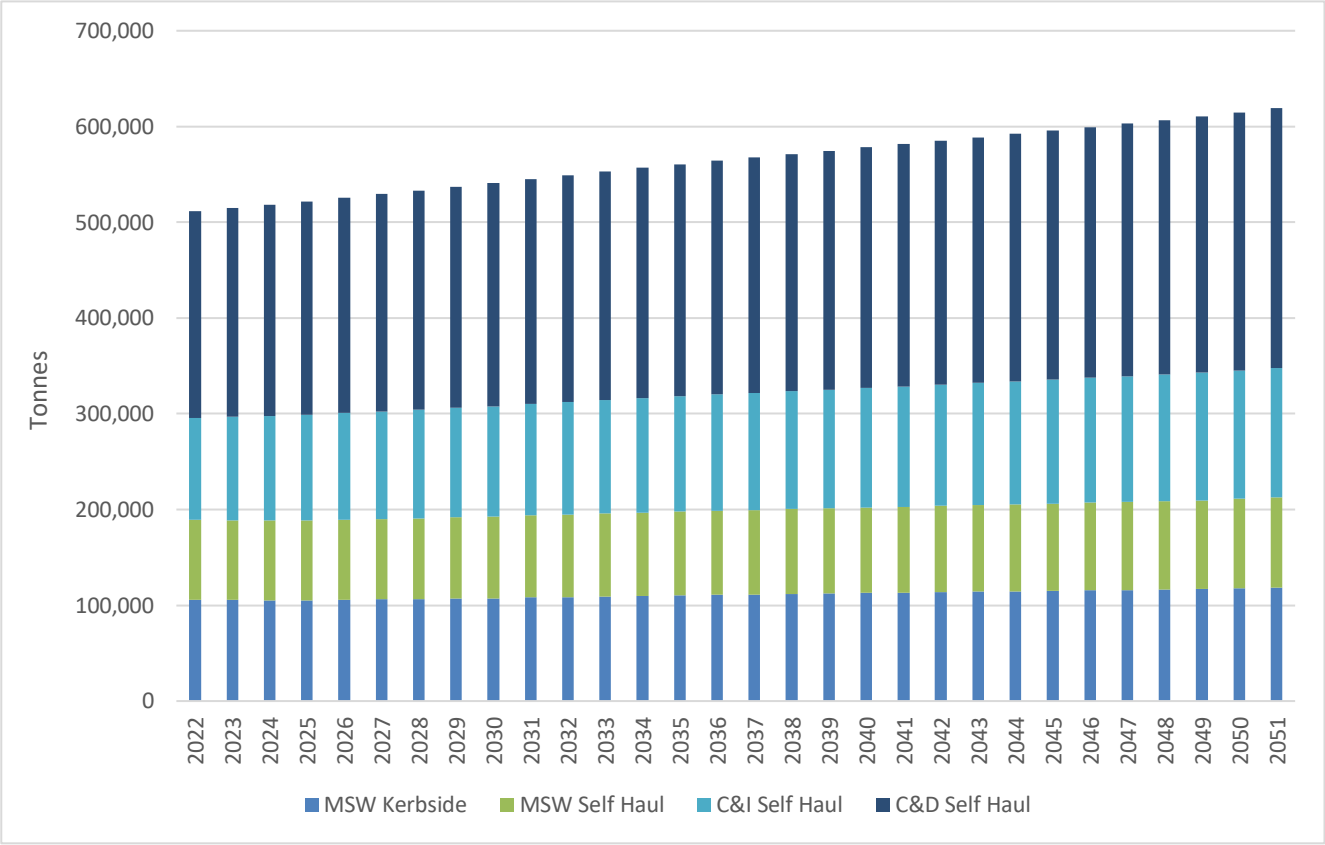


Figure 11 30-year waste projections for the Wide Bay Burnett region by waste stream

3 Key issues and Opportunities

3.1 Landfill capacity

Some landfills in the region are approaching capacity, which will prohibit further landfilling, and require further diverse investment to enable appropriate management of residual waste

Landfills are an essential component of Australia's waste management system. In the Wide Bay Burnett region, landfills receive approximately 45.6% of headline waste (based on FY20-21 reporting year) as reported by the Queensland Government and provide a final disposal solution for waste that cannot be recovered.[21]

The WBB region contains nineteen identified active putrescible landfills that are all council-owned, of which fourteen are considered to be small or very small rural facilities.[22] The resource recovery infrastructure in the region includes eight composting, four mulching, three MRFs, two source separated recycling, and two metals recycling facilities. There are no existing C&D recycling facilities identified in the region. Each LGA has a principal landfill, with landfills in the region generally developed in existing holes, usually formed by quarrying or mining operations and as such, landfill lifespans are inherently finite.[23]

Landfill capacity is primarily defined in terms of remaining airspace, the volume of void which is available to fill with waste.[21] A landfill capacity assessment undertaken to support this Plan has identified that there is approximately 6 million tonnes of approved putrescible landfill capacity in the WBB region, with minimal potential for expansion of capacity. Gympie Regional Council has a need to develop a landfill solution with constructed capacity expected to expire early in 2024, noting additional capacity can be constructed at the existing landfill to give capacity through to approximately 2028. There are currently no inert landfills identified in the region. The landfill capacities and expected exhaustion years are presented in **Table 10.**

Table 11 Wide Bay Burnett Region landfill capacity

LGA	Landfill	Annual disposal (20-21, tonnes)	Current approved capacity (estimated tonnes)	Expected exhaustion of capacity
Bundaberg Regional Council	Bundaberg Waste Management Facility	11,880	600,000[24]	25 Years
Bundaberg Regional Council	Bundaberg Regional Waste Management Facility	84,236	1,700,000	35 Years
Bundaberg Regional Council	Childers Waste Management Facility	1,563	11,000	Imminent conversion to transfer station
Bundaberg Regional Council	Qunaba Waste Management Facility	9,862	315,000	10 years
Bundaberg Regional Council	Tirroan Waste Management Facility	588	5,000	Imminent conversion to transfer station

[21] Arcadis for Department of Environment and Science (2019). Queensland Waste and Resource Recovery Infrastructure Report. Accessed at https://www.qld.gov.au/__data/assets/pdf_file/0034/199249/qld-waste-resource-recovery-infrastructure-report.pdf
[22] Very small = < 2,000 tonnes to landfill p.a. Small = 2,000 to 10,000 tonnes to landfill p.a.
[23] Hyder for Department of the Environment, Water, Heritage, and the Arts (2009). Australian landfill capacities into the future. Accessed at https://www.dcceew.gov.au/sites/default/files/documents/landfill-capacities.pdf
[24] Information provided by Bundaberg Regional Council for this project.

LGA	Landfill	Annual disposal (20-21, tonnes)	Current approved capacity (estimated tonnes)	Expected exhaustion of capacity
Cherbourg Aboriginal Shire Council	Cherbourg Rubbish Tip	650	9,845	2030
Fraser Coast Regional Council	Maryborough Landfill	77,709	3,767,000	2052
Gympie Regional Council	Gympie Waste Management Facility	31,836	180,000	2028
North Burnett Regional Council	Biggenden Waste Management Facility	0	8,177	2025
North Burnett Regional Council	Eidsvold Waste Management Facility	0	518	2025
North Burnett Regional Council	Gayndah Waste Management Facility	0	8,221	2030
North Burnett Regional Council	Monto Waste Management Facility	0	14,861	2050
North Burnett Regional Council	Mt Perry Waste Management Facility	*0*	*0*	*2020*
North Burnett Regional Council	Munduberra Waste Management Facility	0	28,066	2200
South Burnett Regional Council	Kingaroy Waste Facility	35,091	158,543	2029
South Burnett Regional Council	Kumbia Waste Facility	0	TBC	2051
South Burnett Regional Council	Murgon Waste Facility	0	10,920	2031
South Burnett Regional Council	Nanango Waste Facility	0	39,338	2031
South Burnett Regional Council	Wondai Waste Facility	0	19,087	2030

The population of the Wide Bay Burnett Region is expected to grow by 18% between 2016 and 2041[9] with growth forecast in the Bundaberg (19%) and Fraser Coast (21%) regions, moderate growth for Gympie (15%), South Burnett (12%), Cherbourg (6%) and North Burnett Regional Council remaining static. Overall population is expected to grow by 54,000 people by 2024. Population growth is typically linked to growth in waste arisings, however, evidence in Queensland suggests that per capita waste generation is falling, however in the Wide Bay Burnett region marginal growth of waste per capita has been experienced. Other factors such as economic activity, house building, or other construction can also influence growth in waste. As waste generation grows, there is an ongoing need for effective, fit-for-purpose waste avoidance and resource recovery pathways and solutions to avoid the need for expanding landfills or to extend the lifetime. Major projects, such as new hydrogen, renewables, highways, or mining in the region will also increase population and create additional waste volumes during construction, and in some cases wastes which are challenging to manage.

Whilst there is significant landfill capacity at a regional scale, Bundaberg Regional Council and Fraser Coast Regional Council have the added constraint of the increasing cost of landfill disposal. At present there are no commercial scale energy recovery facilities in operation or planned within the region that could be used as a substitute for landfill. Outside of the Wide Bay Burnett Region, there may be opportunities to send some waste that would otherwise go to landfill to be converted into refuse derived fuel in South-East Queensland (e.g., at the in-construction ResourceCo facility in Brisbane) or as a coal substitute in the Cement Kiln at Gladstone.

3.2 Scale for processing and remanufacturing

Individual councils do not have a sufficient scale for processing and remanufacturing recyclable materials or residual waste (given the cost of transport and geographic size of councils), limiting the ability to achieve resource recovery at a commercial scale

Resource recovery is the process of creating value from waste materials, including by reusing, reprocessing, and re-manufacturing discarded materials for secondary purposes such as manufacturing or compost, or generating energy from waste. It excludes any processes that provide no value from waste, such as incineration alone. Resource recovery delays the need to use virgin materials in manufacturing processes that would eventually become waste, as quality recovered, or reprocessed materials can be used as a substitute.[25]

While resource recovery is established in metropolitan Queensland, barriers including scale, transportation, distance, and staff retention reduce the ability to implement commercially viable solutions in regional areas. Following the release of the *National Waste Policy* in 2010, the Australian Government established the Regional and Remote Working Group to better understand the challenges faced by dispersed communities. The working group indicated that the primary barriers to resource recovery for regional and remote areas were poor economies of scale, distances and road conditions between regional centres and limited waste collection services.[26] These barriers are prevalent for Wide Bay Burnett Councils, although relative proximity to South-East Queensland and potential new processing facilities may present new opportunities in the future.

The existing resource recovery facilities in the region include three separate small Materials Recycling Facilities (MRF) which includes the Council owned and contractor managed Bundaberg MRF, the Cleanaway owned and managed Fraser Coast MRF in Hervey Bay, servicing the Fraser Coast and Gympie Regional Councils, and the Council owned and managed Cherbourg MRF, servicing the Cherbourg, Gympie, Fraser Coast, and North and South Burnett regions. The MRFs process aluminium, steel, mixed paper, cardboard, HPDE, PET and mixed plastics for distribution to offtake markets locally and further afield.[27] Fraser Coast Regional Council will shortly have a new MRF in Maryborough.

Cost and scale are the key barriers to waste collection and recovery in the region. Most LGAs provide fortnightly recycling with four councils, Bundaberg, Cherbourg, Fraser Coast, Gympie, and South Burnett offering a conventional two bin service of waste and recycling.[21] All councils provide residents and local businesses with transfer facilities. Under current economic and policy conditions disposal of waste to landfill will remain the most viable solution unless a suitable and commercial alternative is available.

3.3 Insufficient end-markets

There are insufficient local end markets and demand for secondary raw materials, except FOGO/GO, where there is insufficient supply in the region, limiting the ability to achieve commercial rates of return.

The circular economy in Queensland, and Australia more broadly, is still developing. End markets for secondary raw materials are limited, however, national and state policies are prioritising the use of recycled materials in government projects. Generally, end markets are proximate to reprocessing and remanufacturing facilities to enable efficient and commercially viable outcomes.

[25] Queensland Government (2019). Queensland Resource Recovery Industries 10-Year Roadmap and Action Plan, https://www.statedevelopment.qld.gov.au/__data/assets/pdf_file/0014/17204/resource-recovery-roadmap.pdf
[26] National Waste Policy Regional and Remote Australia Working Group. Solutions for waste management in regional and remote Australia
[27] Queensland Government. (2019). Cleanaway on track to achieve a more sustainable future for the Fraser Coast. Accessed at https://www.statedevelopment.qld.gov.au/news/cleanaway-on-track-to-achieve-a-more-sustainable-future-for-the-fraser-coast

Generally, private organisations are responsible for resource recovery processes and therefore investment attraction is critical to developing sustainable circular economies. Visy is one of Australia's leading resource recovery companies and in 2022, announced a $700 million investment in Queensland recycling and re-manufacturing. Included in the commitment is $500 million for a new glass food and beverage container recycling and manufacturing facility in Yatala, SEQ, a new $150 million corrugated box factory at Hemmant, SEQ, and $48 million towards major upgrades to the MRF on Gibson Island, SEQ.[28] Visy's product range covers food and beverage, commercial and industrial, retail and online and moving and storage, for which its major markets are located proximately in SEQ.

With local end markets concentrated in SEQ, the challenge remains for regional areas to achieve commercially viable local reprocessing and remanufacturing. All kerbside collected recyclable material is processed locally at one of the three MRFs, with the outputs transported out of region to SEQ end markets or exported which is assumed to increase prices and limit value for money outcomes. Investment in the development of end markets, such as manufacturing industries, in Wide Bay Burnett would be required to change this approach, and to support resource recovery facilities in the region and drive increased use of local recycled materials.

While regional areas currently struggle to compete with metropolitan areas, there is increasing support from governments at all levels to shift business to the regions to drive job growth and economic activity. In June 2022, the Queensland Government committed an additional $10 million to continue the *Manufacturing Hub Grants Program* for a further two years. Since its inception in 2017, the program has supported 104 advanced manufacturing projects across the state with 38 per cent delivered in regional Queensland.[29] Regional areas are attractive locations for large operations due to there being more space and fewer operation limitations such as transport and noise restrictions. Positioning Wide Bay Burnett as an attractive location for such activities would assist in creating end markets for recovered resources. There is a significant opportunity for the region as it aims to deliver increased regional wealth, as set out in the Wide Bay Burnett Economic Development Strategy 2019-2024,[30] with the strategy providing a strategic roadmap for the region whilst the Wide Bay Burnett Regional Plan (2011) is being reviewed to ensure it best reflects the Queensland Government's strategic direction for managing population growth and regional development.[31] Furthermore, attracting industry and increasing regional development will create additional end markets for recycled material making resource recovery processes more viable.

Despite these challenges, progress is being made in some regional areas through support from the Resource Recovery Industry Development Program. Initiatives include the development of a new MRF in Maryborough to increase the recovery of recyclables from kerbside collection, the establishment of a C&D waste processing facility in Hervey Bay to increase recovery rates, and a feasibility study to inform a final investment decision for an energy cogeneration plant in Gympie which will support operations of the Laminex Gympie (Toolara) plant, which processes medium density fibreboards.[32] There are a number of other established C&D and concrete reprocessers, and metal recyclers in the region although data is limited for volumes.

[28] Visy. (2022). Our $700 million investment in Queensland recycling and re-manufacturing. Accessed at https://www.visy.com.au/newsroom/2022/4/28/queensland-investments
[29] Queensland Government. (2022) Made in Queensland. https://www.rdmw.qld.gov.au/manufacturing/manufacturing-assistance-programs/made-in-queensland
[30] Wide Bay Burnett Regional Organisation of Councils (2019). Economic Strategy 2019-2024. Accessed at https://wbbroc.org.au/wp-content/uploads/2019/09/WBBROC-Economic-Strategy-2019-2024-Web-version.pdf
[31] Queensland Government (2022). Planning – Wide Bay Burnett regional plan. Accessed at https://planning.statedevelopment.qld.gov.au/planning-framework/plan-making/regional-planning/wide-bay-burnett-regional-plan#:~:text=The%20Draft%20Wide%20Bay%20Burnett%20Regional%20Plan%202022%20assists%20local,affordable%20and%20diverse%20housing%20choices.
[32] Queensland Government (2022). Resource recovery, Industry Development Program. Accessed at https://www.statedevelopment.qld.gov.au/industry/priority-industries/resource-recovery/industry-development-program

Despite a lack of end markets for reprocessed recycled materials, there are several composters in the region, such as Green Solutions Wide Bay who provide residents with free green waste drop-off for recovery. They operate an open windrow composting facility to process green waste where they screen the materials, ground, and form the materials in to windrows which are pasteurised and cured before being processed as a final product. NuGrow – Waste and Recycling operate the Bundaberg Composting and Recycling Facility which offers services for liquid, solid, and green waste, including garden organics from Fraser Coast Regional Council. This site has the potential to receive food organics in the future pending approval conditions and technology requirements. The compost products created both composting facilities are expected to comply with the Australian Standard for Soil Conditioners and Mulches AS4454.

Oreco Group manufacture high quality garden and animal care products through various processes using repurposed waste materials and organics sourced from their own products and from farms within the region. Operations of large-scale composters in the region would indicate a significant demand for garden waste and compost from within the region, most likely from agricultural producers who use the compost on their crops and farms.

3.4 Community understanding and behaviours

> *A lack of community understanding and concern around the increasing cost and environmental impacts of waste management and absence of incentives or disincentives for households to improve behaviours is contributing to inefficient waste management practices*

There is a clear need and ambition to improve the resource recovery rate across Wide Bay Burnett to reduce environmental impact, optimise the life of the landfills, and manage cost pressures. However, much of the community do not understand the cost of managing their waste, or challenges faced by Councils and the value of resource recovery. There is a need for investment in long term community and industry education to improve resource recovery and add value to recyclables.

Contamination rates from audits undertaken by Councils range across the region from 16.3-18%.[33] The general community is not aware of the environmental problems caused by waste generation and find it difficult to connect individual actions to address those problems. Most people do not know where their waste goes, whether it is recyclable or if it can be recovered. Many people in the community are not sure what happens to their waste, or whether their actions make a difference. The lack of understanding across the region has led to high contamination rates in kerbside bins and low resource recovery rates, as potentially recyclable items are disposed rather than recovered. This exacerbates existing challenges regarding scale for reprocessing and remanufacturing in regional locations.

Illegal dumping is also a concern across the Wide Bay Burnett region, where low population density and distance from waste infrastructure leads to illegal disposal and dumping of large waste volumes in remote areas. Littered and illegally dumped wastes are a substantial source of environmental contamination. Waste in the environment can cause animal entanglement, injury and death, and the economic costs of litter and illegal dumping are nearly always borne by local councils.[34] Prevention of littering and dumping reduces or avoids these costs, demonstrating the importance of investment in litter and dumping prevention, targeted surveillance, and enforcement at identified illegal dumping hotspots, and efforts to modify behaviour.

[33] Combination of council provided information and that reported in QWDS.
[34] Queensland Government: Department of Environment and Science (2021). Keeping Queensland Clean: the litter and illegal dumping plan. Accessed at https://www.qld.gov.au/__data/assets/pdf_file/0024/176262/keeping-qld-clean-lid-plan.pdf

Better messaging, such as emphasising how waste can be transformed into new objects, may make a difference. However, information alone cannot always drive sustainable behaviours. The community must feel motivated, and the best motivations may be a combination of environmental benefits with personal incentives, such as economic rewards, increased status, or social connections.[35]

In the first instance, initiatives that encourage waste avoidance and product reuse should be prioritised to reduce end-of-life volumes. Waste education should be integrated into specific actions areas in each LGA and should be supported by regional campaigns such as consistent messaging across the region and shared resources and messages.

While education is valuable, behaviour change is often reliant on the choices available to the community. The provision of additional residential bin services, such as co-mingled recycling and FOGO, provides the community with a convenient alternative to standard disposal in the residual waste bin. While these services may be cost prohibitive to some Councils with low population density, resource recovery infrastructure such as MRFs and transfers stations may be feasible to further recover materials from the MSW stream.

3.5 An opportunity for local economic or community benefits

> *There is an opportunity to develop and support new and innovative resource recovery industries as well as create regional and local economic and community benefits through collaborative waste management planning between Wide Bay Burnett councils and the broader region*

The Wide Bay Burnett region has a varied economic base and benefits from a diverse natural environment and range of industries, liveable cities, and its strategic position to provide goods and services to domestic and international markets. The region has access to these markets through the Port of Bundaberg, multiple intraregional highways, and numerous regional and local airports. The waste management and resource recovery sector is already an important contributor to the economy, however, there is further potential to grow the sector by improving recovery of resources and investing in the resource recovery industry.

The WBB Economic Strategy outlines a roadmap for WBB to deliver increased regional wealth to the region, and act as an enabler to facilitate businesses, the government, and stakeholders to grow the region's economy. For the waste management and resource recovery sector, this includes action relevant to this Plan such as planning and partnerships, circular economy development and regional infrastructure.

A focus on driving these outcomes through further industry growth presents opportunities for the development of downstream waste industries in the region. Economic value and jobs for Wide Bay Burnett residents can be created through the development of resource recovery industries, however, capacity for jobs requires scale of recovered waste. As identified in previous sections, this is a barrier at an individual council level in the Wide Bay Burnett region.

A key pathway to achieving economic growth in the Wide Bay Burnett region will be increased collaboration and knowledge sharing between Councils. Increased collaboration across policy planning, procurement and delivery of infrastructure will be necessary to respond to the State and national push towards a circular economy while ensuring solutions are right-sized and cognizant of regional economic drivers and community needs. This increased focus on collaborative planning can also provide opportunities to articulate and plan for challenges facing the region now and into the future.

[35] The Conversation (2019). How to boost recycling: Reward consumers with discounts, deals and social connections. Accessed at https://theconversation.com/how-to-boost-recycling-reward-consumers-with-discounts-deals-and-social-connections-124389

A key benefit of investment in the waste and resource recovery industry in the Wide Bay Burnett region is the opportunity to increase both skilled and unskilled employment. There is significant potential for economic growth in the waste management and resource recovery sector in Queensland. For every 10,000 tonnes of waste that goes to landfill, it is estimated that fewer than three jobs are supported, but where that waste is reused or recycled, it is estimated that there are more than nine jobs created. The higher job rate for recycling is due to the higher number of activities associated with the recycling process, and in particular the sorting, transfer, and transformation of materials into new products, and the labour-intensive nature of some of these processes compared with landfill-related employment.

3.6 Meeting state and Commonwealth waste objectives and targets for waste management

The objectives and targets in the Queensland Waste Management and Resource Recovery Strategy[7] and National Waste Policy Action Plan[37] cannot be met with existing infrastructure, initiatives, funding, resourcing, and supporting policy in Wide Bay Burnett

Recognising that a shift to a circular economy requires a national approach, the *National Waste Policy*[36] was updated in 2018 by the Federal, State and Territory governments. In 2019, the *National Waste Policy Action Plan*[37] was delivered, outlining several strategic priorities as a framework and guide to implement the National Waste Policy.

Details the Wide Bay Burnett regions' performance in comparison to the Queensland average and targets was presented in **Table 10**. Overall, the region is performing slightly above the current state average, with C&D recovery reported as the highest performer achieving the 2025 target.

The issue with targets is not that the waste diversion (or reduction, or recycling) targets cannot be met, the critical issue is that the cost of making the transition towards zero waste to landfill, and greater recycling is not necessarily well understood. Furthermore, where change is required from an existing system, the question of who pays is fundamental, although adopting the polluter pay principals, ultimately the cost of these changes is borne by the consumer or ratepayer, who is typically the same. The introduction of the levy in 2019 provided a safeguard measure to protect the cost to households from implementation of the levy. Whilst this is now being reduced for some Councils (Bundaberg Regional Council, Fraser Coast Regional Council), this now becomes a cost that Council must recover, although potentially supported by funding from the State or Commonwealth Government, or via services provided by private sector operators, however the question returns to how this cost is covered and the environmental and economic benefit from achieving the targets.

The 2025 targets will not be met, and this is consistent across the state. There is a need for pragmatism when considering the technical, economic, and environmental practicalities of pursuing a zero waste to landfill strategy, particularly when set within the context of the waste legislation and policy settings in Queensland.

[36] Australian Government (2018). National Waste Policy. Accessed at https://www.dcceew.gov.au/sites/default/files/documents/national-waste-policy-2018.pdf
[37] Australian Government (2019). National Waste Policy Action Plan 2019. Accessed at https://www.dcceew.gov.au/sites/default/files/documents/national-waste-policy-action-plan-2019.pdf

As a qualifying statement, the Plan provides a pathway towards improved resource recovery and recycling but recognises that the path and outcome compared to the State and Commonwealth objectives and targets may be different. There is a need for pragmatism when considering the technical, economic, and environmental practicalities of pursuing the waste objectives and targets, particularly when set within the context of the current waste legislation and policy settings in Queensland.

4 Organic waste

Organic waste is identified in both National and State guidance documents as a low hanging fruit when it comes to diverting more waste from landfill. There is significant support via the National Food Waste Policy to divert more food waste from landfill, supported by the establishment of research and roll out of the Food Waste behavioural change programs by the Queensland Government, alongside a series of actions in Queensland's Organic Waste Strategy and Action Plan. A key consideration of the options assessment for this Plan was the prospect of introducing regional or individual council scale organics collections. This section considers:

- The existing dynamics of the organic waste stream in the Wide Bay Burnett Region
- Potential levers and interventions
- Major options considered
- The expected outcomes of the preferred options
- What is required to support the change including cost; and
- What may change during the implementation of the Plan

4.1 Organic material stream dynamics

Organic waste across the region is managed via several collection pathways. All councils provide self-haul facilities where residents and local industry can drop off garden waste. In Bundaberg there is also a privately operated facility where residents can drop off garden waste for free which is composted and reused in agriculture. In general, self-hauled garden waste is processed locally by councils. Fraser Coast Regional Council sends its garden organic waste to a private composting facility at Gregory River, located between Maryborough and Bundaberg. Bundaberg Regional Council sends its garden organic waste to a private composter located near Bundaberg where it is processed into soil amendment products and used in agriculture.

Within the region, Councils and the private sector received and recovered a reported 86,165 tonnes of green waste in FY20-21. For organic waste this represented a recovery rate of 69% for organic material and contributed 10% to the overall region recovery rate. This is solely green waste received and is typically processed into a mulch or compost. Information provided by Councils indicated that there is strong demand for high quality organic waste derived product for reuse within agriculture, particularly in the Bundaberg Region.

A significant proportion of household food and garden organics are still disposed of in the residual bin across the region. **Figure 12** presents the estimated breakdown of organic waste based on audit information for organic waste managed at Council sites within the region.

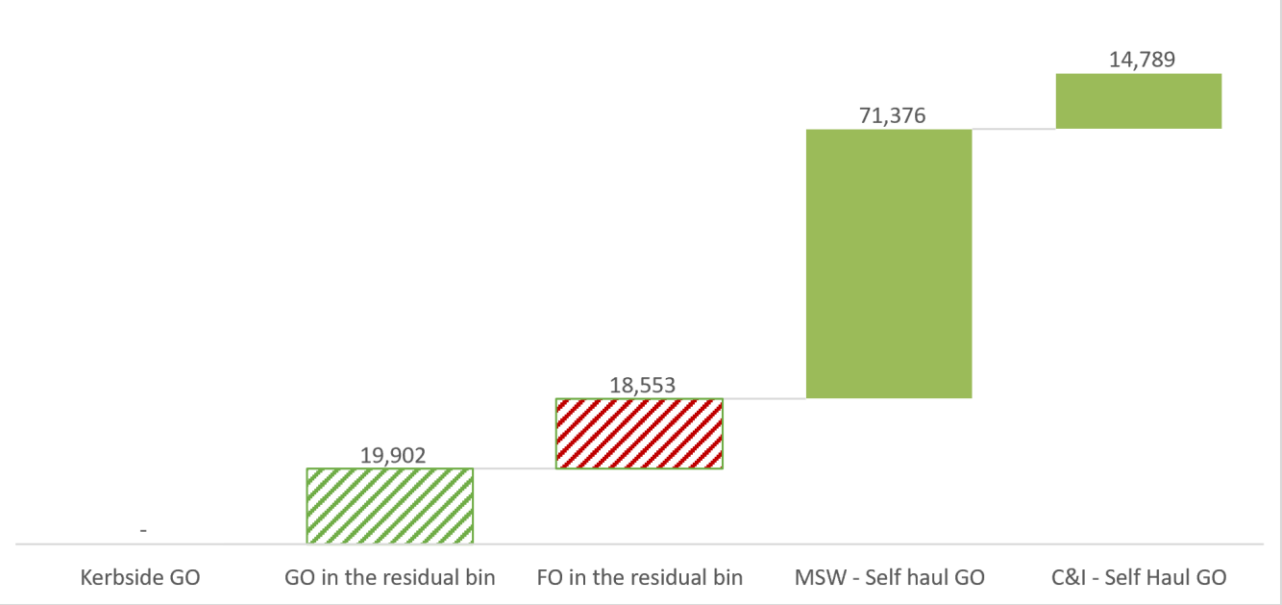


Figure 12 Estimated breakdown of organic waste managed by councils in region (tonnes)

Geographical diversity also influences organics collection and processing across the Wide Bay-Burnett region. For example, the Councils within the region with very low population density, and with households generally on larger blocks are more likely to have informal at home organics diversion solutions in place, such as compost heaps, chickens, or worm farms, compared to higher density parts of the region such as parts of the Bundaberg, Gympie, and Fraser Coast LGAs.

Away from reported kerbside organic waste, other organic waste streams are generated within the region. This includes a range of agricultural residues and wastes. Analysis undertaken by the Queensland Government in FY18-19 indicated that there was a combined total of 1,291,550 tonnes of food crop residues and 257,060 tonnes of organic wastes and other residues in the region. The latter includes material reported in the graph above. These values are significant although it is noted that a high proportion of this material is already managed and is not necessarily available for reprocessing.

4.2 Levers and interventions

4.2.1 Avoiding and reducing organic waste

Organic waste reduction or avoidance can be achieved through education with support from other levers, which may also link to regional or council landfill diversion solutions. Under Queensland's Organic Waste Strategy there are specific actions to support national objectives to halve food waste, including a reduction in food waste of 10% per household by 2025. The Queensland Government currently has the license to the Love Food Hate Waste branded education and engagement program developed by WRAP[38] in the UK. Fraser Coast Regional Council participates in Love Food Hate Waste already. Some existing councils within the region provide education packages that include composting at home[39,40,41] however the ability to commit resources to education varies across councils within the region.

The roll out of state-backed education or behaviour change campaigns such as deployment of Love Food Hate Waste materials is likely to require additional resources to have a significant impact. Education could be delivered at a regional scale for issues such as behaviour change to avoid food waste without impacting individual council service delivery. This could be delivered to commercial or industrial premises. Avoiding household generated food or garden organic waste being disposed of into a residual bin could be supported by the provision of at-home composting equipment such as compost bins or worm farms supporting education campaigns.

Some Councils in the Wide Bay Burnett region have implemented behaviour change initiatives to improve household practices, increase community knowledge of waste streams, and improve the potential for resource recovery. The Bundaberg, Fraser Coast, and Gympie Regional Councils have all implemented waste and recycling education programs, which are facilitated through educational tours of waste facilities and consultations, with the main target audience being primary and secondary school students. The educational programs aim to develop environmental values and encourage long-term environmental behaviours.[42] Utilising Queensland Government support these initiatives should include meaningful measures to avoid food waste.

4.2.2 Alternative pricing strategies / pay as you throw

Aligned with education and behaviour change is the development of a bin sizing and price incentive strategy. This approach, currently being considered by several councils in Queensland based on experience from elsewhere in Australia and overseas would seek to achieve higher landfill diversion by aligning bin volume pricing to the polluter pays principal and backing this up with targeted enforcement. This approach may also seek to include pricing mechanisms that prioritise recycling or organics collections over residual waste systems.

[38] WRAP, 2022. Love Food Hate Waste – Why we're here.
[39] Bundaberg Regional Council, 2023. Waste and recycling education: Waste minimisation – Bundaberg Regional Council. Accessed at https://www.bundaberg.qld.gov.au/waste-recycling/education-waste-recycling/5
[40] Fraser Coast Regional Council, 2023. Composting Workshop – Fraser Coast Regional Council. Accessed at https://www.frasercoast.qld.gov.au/events/event/410/composting-workshop
[41] South Burnett Regional Council, 2023. Introduction to Composting and Worm Farming Workshop – South Burnett Regional Council. Accessed at https://www.southburnett.qld.gov.au/events/event/211/introduction-to-composting-and-worm-farming-workshop
[42] Gympie Regional Council (2022). Waste Education Program. Accessed at https://www.gympie.qld.gov.au/waste-education-program

4.2.3 Levies and bans

4.2.3.1 Landfill levy and annual advanced payment

Organics managed within the residual waste stream and landfilled is subject to the landfill levy, except for waste generated in the Cherbourg Aboriginal Shire Council area. The current landfill levy applied to general waste in the regional zone is $88 per tonne disposed of, with the levy rate to increase by the rate of CPI in future years. The annual advanced payment for FY22-23 is 105%, which is scheduled to reduce to 100% for Gympie Regional Council, North Burnett Regional Council, and South Burnett Regional Council through to at least FY30-31. Bundaberg Regional Council and Fraser Coast Regional Council are scheduled to receive progressively lower annual advanced payments over the same period. The continued return of landfill levies paid by the three Councils through the continuation of annual advanced payments allows the continuation of the commitment of no-direct impact to households, however, provides little financial disincentive to reduce the amount of organic waste going to landfill.

For Bundaberg Regional Council and Fraser Coast Regional Council the cost of landfill disposal will increase to be nearly $90 per tonne in FY30-31. This provides a potential opportunity to consider the benefit of introducing further organics diversion to minimise the impact of upcoming cost increases.

4.2.3.2 Landfill bans

The Queensland Government is currently exploring the potential for banning of organic waste from landfill to help increase diversion[43]. Individual landfill facilities could also adopt bans however this is considered unlikely in the region. It is expected that should the Queensland Government decide to legislate bans on organic waste to landfill within the region, there would be a very long-lead time to allow local government and industry to adjust, and to ensure collections and post-collection processing infrastructure could support the flow of material.

4.2.4 Introducing new organics collections services

Most Councils in the region provide a transfer station facility for self-hauled green organic waste across the MSW, C&I and C&D streams, noting no organic waste is captured in the C&D stream. No kerbside collection services are provided in the region, although there are substantial self-haul arisings managed by private sector organic waste processing businesses in the region.

An option for all Councils could be to introduce a new kerbside organics collection service. An estimate of potential material within the household organic waste system for each Council is shown in **Table 12** based on the FY20-21 dataset and audit data.

[43] State of Queensland, 2022. Queensland Organics Strategy and Action Plan.
https://www.qld.gov.au/environment/management/waste/recovery/reduction/organics-strategy

Table 12 Potential organics in kerbside waste per LGA

LGA	Potential Food Organics in residual bin (tonnes per annum)	Potential Garden Organics in residual bin (tonnes per annum)	Total potential organics (tonnes per annum)
Bundaberg Regional Council	6,346	9,807	16,153
Cherbourg Aboriginal Shire Council	70	67	137
Fraser Coast Regional Council	7,765	7,412	15,178
Gympie Regional Council	2,995	2,859	5,853
North Burnett Regional Council	406	388	794
South Burnett Regional Council	1,044	865	1,909

Note – availability based on forecast arisings in FY25-26 and available compositional data

Key decisions for new organics collections within the region would need to include:

- Which Councils will introduce a service, and the drivers for this including cost of landfill disposal, geography, ability to meet any increased costs, and the general direction of council and commitments made in other strategic documents and planning.
- Who the service is offered to, whether to households, or for commercial premises, and the areas of service (i.e., not all councils provide a household garbage/recycling service to all households within the region). This includes consideration of whether individual councils provide the service.
- The type of material to be collected (e.g., whether to include all food wastes including meat, bones, dairy and fruit and vegetable scraps) or a restricted list. Councils may also wish to commence a kerbside garden organics collection service first, with a view to considering implementation of a kerbside FOGO service in the future.
- The frequency of service provided to optimise collections vs cost, and the potential to reduce the kerbside general waste collection frequency from weekly to fortnightly to offset new collection cost.
- Options for take up by residential or commercial service providers, including whether the service provided is mandatory, opt in, or opt out, noting that universal systems tend to have higher diversion rates.
- The type of facility to be constructed for processing, noting that some technologies are considered better for odour management than others however this also depends on the nature of feedstock.

Additional costs to support new services would include new organic waste bins (assumed 240L) for all households receiving the new service. Where the existing residual bin is not red (typically older waste bins are dark green lidded) it may also be necessary to replace the bin lid to avoid confusion with the light green coloured organics bin, and to meet national harmonisation standards.

Additional at home infrastructure such as kitchen caddies and bin liners may also be required, which add additional costs to implementation. The indicative one-off cost of new household equipment required for introducing a new FOGO service is estimated to be in the range $60 to $84 per household with the variance depending on whether councils provide a kitchen caddy and liners for residents. The breakdown of this cost is shown in **Table 13**.

Table 13 Indicative One-off Costs for Collection Consumables

Item	Cost per item excluding GST
Mobile bin (240L)	$45
Delivery & distribution of bins	$15
FOGO kitchen caddy liners including delivery	$13 (pack of 200)
Kitchen caddies including delivery	$11
Re-lidding of mobile bin	$11-$21

Source: Council provided information, indicative quote from equipment provider

4.2.5 Education to support a new kerbside organic collection

The introduction of a new collection service for organic waste within the region would require supporting education and engagement prior to and during implementation. Evidence from Victoria indicates whole of system education costs including a range of waste education and reduction measures for a 3-bin system including FOGO collections should be estimated at approximately 5% of overall waste management costs. Additional funding may be required in the first year of a new service to include business as usual, improvements to the yellow bin service and food waste avoidance, and organics education including FOGO education and food waste avoidance estimated at $8 per household (noting if Councils decided to introduce a garden organics collection service these costs may be reduced). The breakdown of this cost is shown in **Table 14**.

Table 14 Indicative Costs for Education

Item	Cost per household per annum excl. GST (2021/22)
Business as usual (assumed for single or two bin system)	$4 per HH/yr
Improvements to the yellow bin service and food waste avoidance	$8 per HH/yr
Organics education including FOGO education and food waste avoidance	$8 per HH/yr

Source: Council provided information.

To support a new organic collection education and soft enforcement through bin tagging are already applied for the kerbside recyclable collection, councils already have powers under local laws to apply penalties for offences around bin collection and materials placed in bins, which could be utilised or modified to support implementation. It is assumed that these activities are captured within the $8 per household per year cost for FOGO service implementation education.

4.2.6 Post collections infrastructure

Organic waste processing infrastructure is required to recover or recycle a greater volume of material. There are several established organic wastes processing facilities, including shredding/grinding, and composting within the region. The compost product is understood to be sold predominantly for agricultural purposes, as well as in the landscape amenity market. The addition of food waste, either individually or via a mixed food and garden organics service (FOGO) may require more involved processing but have outputs that are generally of higher value. There are several considerations when choosing organics processing infrastructure, including the type and quantity of feedstock, quality of product required, and key location specifics such as proximity to sensitive receptors or product offtakers.

There are a range of technologies available to process the FO, GO and FOGO stream. Some of these are summarised in **Table 15** noting that there are a wide range of different technological solutions for composting that could be considered by Councils in detail.

Table 15 FOGO processing options

Description	Mulching	Open windrow	Covered aerated static pile (CASP)	Covered inoculated static pile (CISP)	In-vessel composting	Anaerobic Digestion
Process	Use of grinding equipment to create a mulch product.	Composting via open windrow methodology	Composting process enhanced by piped air supply with use of a membrane cover system to manage odours.	Process enhanced by fermentation – compost pile is inoculated with specialised microbes and covered.	Composting undertaken in tunnels with air circulated beneath tunnels; open windrow for maturation.	The breakdown of organics by microorganisms in an enclosed oxygen free environment
Suitable feedstock	Garden Organics	Food and/or Garden Organics	Food and/or Garden Organics	Food and/or Garden Organics	Food and/or Garden Organics	Food Organics
Capital cost	Mobile Plant	$0.5M-4M	$4M-$20M	$1M-$5M	$20M-$34M	$10M -$30M
Estimated operating cost	$10-$40 / tonne	$30-$120 / tonne	$50-$70 / tonne	$50-$70 / tonne	$20-$120 / tonne	$70 to $200/tonne
Output product	Mulch	Compost	Compost	Compost	Compost	Energy, Digestate

Note: indicative costs provided based on 20k to 30ktpa organics processing facility; real costs would form part of detailed business case
Capital costs exclude site preparation, output product quality depends on quality of input. Detail based on benchmarking.

As there are existing composting facility operations in the region, where FOGO collection services are introduced, it may be more cost beneficial for Council to procure a service rather than seek to involve themselves in the build, ownership, or operation of their own facility. Under the service provision scenario, Councils would pay a gate fee for the processing, secondary product manufacturing and distribution of recycled organic material.

Key considerations for organics processing facilities in the region are:

- Type and volume of feedstock
- Location of facility, including number of facilities required within a region
- Transport costs, and benefit of location within a precinct
- Existing facilities and technologies that could provide a service, and whether a new service might impact their ability to continue operation.
- Specific technology to be deployed to meet specific location requirements.
- Facility procurement, ownership, operations, and funding models which provide greatest value for money
- Timeframes for intervention and required go-live date
- The potentially to introduce a garden organics service first as a precursor to a future FOGO service

- The requirements of the Queensland Government's model operating conditions for processing food waste as part of the FOGO stream

Additional technologies may be deployed at a smaller scale to manage organic wastes locally, including anaerobic digestion which may be an option at a small scale for more remote or island communities.

4.2.7 Establishing a market for recycled organics

At a regional scale several offtake markets will need to be identified for recycled organic products. Product quality may dictate the end market, but end market demand may also drive manufacturing of certain products containing recycled organics. In the region the urban amenity market and landscaping is identified as a key target and the establishment of new composting facilities in the regional could be expected to contribute to this.

Councils within the region may drive continued demand for this material by using on their own parks and gardens. Other markets may include intensive agriculture, broad acre agriculture or rehabilitation of mine sites, however the product value is likely to vary. Other markets may include or rehabilitation of mine sites, however the product value is likely to lower for this use. Agriculture is generally assumed to be able to utilise large volumes of FOGO compost that could be produced, but further work is required to establish supply or offtake agreements, and perhaps proven quality and benefit. The material may be sold in bulk, but further investment may be required to include screening and bagging infrastructure. Information provided by Councils to support this Plan indicates a price of $30 to $120/tonne for recycled organics product may be achievable in the Bundaberg Region depending on product quality.

Product quality is likely to determine the end price and applicability for all end markets. Contamination of both self-haul organics as well as future kerbside collections is a critical issue that has not yet been resolved. At a household level, education will be important in ensuring items that are not suited to composting are not placed in a FOGO collection service bin. Although compostable, some single-use containers can add additional contaminants, and do not currently meet the definition of FOGO in Queensland.

There also remains additional concern in operation of organics processing facilities with the presence of emerging contaminants such as PFAS in all waste streams, including organics. These concerns need to be addressed in waste collection, processing, and product quality to maintain offtake agreements.

4.3 Major options considered

Major options considered for how organic waste is managed in the region are presented in the following table and discussed in subsequent sub-sections:

Table 16 Major organic waste decisions

Decision area	Business as usual	Options				Rationale
Priority of focus on organic waste stream	Limited specific focus on organic waste diversion	Not a priority focus		Priority focus		Clear driver for BRC and FCRC with annual advance payment change. Focus under Organics Action Plan for region but specific to each Council.
Point of organics separation	At home composting + self-haul + one individual GO collection	FOGO collections for individual councils as business case and economic conditions dictate		FOGO collections for whole of region		BRC/FCRC to progress development of FOGO collections offering for LGA. Other councils to continue BAU collections.
Waste stream composition for collection	Garden Organics / Green waste only	Garden organics only	Food organics only	All garden organics and some food organics	All food and garden organics	BRC and FCRC only – assumed move to FOGO collections. Accepted contents to be determined.
Waste stream for self-haul	Garden Organics / Green waste only	Garden organics only	Food organics only	All garden organics and some food organics	All food and garden organics	All councils to continue to receive self-haul green waste to transfer stations.
Processing technologies	Mulching & local composting (private sector)	Small scale organics infrastructure	Open Windrow	Covered windrow systems	In-vessel composting	Councils to work through individual solutions for processing technologies. May depend on private infrastructure.
Infrastructure ownership	Mulching infrastructure limited	Council owned and operated	Council owned, privately operated	Privately owned and operated	Other	BRC and FCRC likely to seek a service from private industry.
Market development	Mulch product used locally, given away, some challenges	Limited intervention	Moderate level of support or intervention to establish local offtake markets for all products		High level of support or intervention	Secondary market for recycled organics requires further establishment and support.
Approach to behaviour change: Food waste avoidance	Limited delivery through waste education team members.	Limited focus	Priority focus at individual council scale		Priority focus at regional scale	Food waste avoidance can be delivered at regional scale to tie in and leverage state-based support.
Approach to education: collections	Delivery through existing service offerings	Limited focus	Priority focus at individual council scale		Priority focus at regional scale	Different collections will require different approaches. For new collections BRC and FCRC will require significant input
Non-infrastructure organics solutions	No solutions offered	Provision of at home composting solutions (program)		Provision of community composting facilities to allow food scrap diversion		Additional non-infrastructure solutions to allow participation in LGAs or parts of LGAs with lack of access.

Cells in GREEN reflect decision made; BRC – Bundaberg Regional Council, CASC – Cherbourg Aboriginal Shire Council, FCRC – Fraser Coast Regional Council, GRC – Gympie Regional Council, NBRC – North Burnett Regional Council, SBRC – South Burnett Regional Council

4.3.1 Priority of focus on organics waste stream

It is estimated that around 50% of the kerbside residual bin collected from households in the region is organic in nature. With the increasing cost of landfill disposal for Bundaberg Regional Council and Fraser Coast Regional Council, a desire to minimise waste sent to landfill, and the known greenhouse gas emissions caused by organic waste in landfill, there is a clear need to divert organic waste from landfill in the region. However, this is tempered by the geography of the region and the economic conditions including waste levy and annual advanced payment settings for all Councils except Bundaberg Regional Council and Fraser Coast Regional Council.

Bundaberg Regional Council and Fraser Coast Regional Council are developing feasibility and business case documentation to consider the establishment of an organics diversion service commencing from FY26-27. For the other council areas, the organic waste stream is not as much a priority, although efforts should be made to allow participation in reduction and diversion activities at a local scale through access to food waste avoidance programs or other participation events. Alternative collection approaches, such as a milk run for organic waste from households and businesses should be converted from concept into trials that can be supported by the Queensland Government.

4.3.2 Organics separation approach

In FY20-21 a reported 86,165 tonnes of green waste were self-hauled to transfer facilities in the region across the MSW and C&I streams. This includes an estimated 22,000 tonnes of green waste self-hauled in Bundaberg to private facilities. It is expected that self-haul will continue as the separation approach for garden organics across the region. For Gympie Regional Council, North Burnett Regional Council, South Burnett Regional Council, and Cherbourg Aboriginal Shire Council separate kerbside organic waste collections are not a priority in the short-term under current levy and policy settings, due to the potential cost impact on household and relatively low resource recovery benefit. Education activities that focus on food waste avoidance and at home or community composting activities should be supported. These Councils may progress kerbside organic waste collection in the future, because of policy change or through community or council led change.

4.3.3 A new kerbside organics collection service in Bundaberg and Fraser Coast LGAs

To support greater organics collection in the Bundaberg Regional Council and Fraser Coast Regional Council areas a kerbside FOGO collection service will be introduced. The service will commence as soon as economically practicable and pending individual Council approval. The service area is expected to be provided to residents that currently receive a kerbside commingled recycling bin collection, noting specific coverage will be identified by councils undertaking specific business case development. To support economic analysis, it was assumed 80% of households currently receiving a waste collection service would receive a kerbside food and garden organics service. There could be opportunities for councils to collaborate on collection or processing contracts, with benefits from duplication of procurement activities or from shared operational management. To support the roll out of a new kerbside collection system, significant and early investment is required in education to drive initial behaviour, followed up by ongoing education efforts.

Development of specific business cases will support the best value combination of cost versus service and impact on residual bin collections. In the future this service may expand or a new service to collect commercial food waste from commercial customers will be explored.

4.3.4 Processing technology

Mulching is a favourable solution for self-hauled green waste managed by most Councils. Large amount of garden organics are also used in composting processes particularly in Bundaberg and Fraser Coast LGAs. Composting is expected to be the primary processing technology for FOGO however technology may yet still be determined.

The Department of Environment and Science is currently considering the risks associated with processing FOGO and specific requirements for processing facilities which is expected to assist in determining facility location, technology to be deployed, and subsequently cost. This may necessitate improvements to existing facilities where food waste is received. A further consideration in the region is the integration of existing green waste processing into future composting activities. Open windrow composting is likely to be the most cost-effective solution for councils.

4.3.5 Infrastructure ownership and facility delivery vs service fee

There are a range of ownership and funding options available for organic recycling technology. This will be reviewed and considered during the development of business cases and funding requests, however, could include options for Councils to own facilities, design, build and operate, or engage the private sector to do one or all the options. The decision will be made on the most cost-beneficial approach and risk/impact on ratepayers.

Where the private sector is engaged to deliver services relating to organic waste collection or processing, decisions for technology will reside with the solution provider and be reflected in the gate fee paid by the Council or other waste providers. This approach reduces operational risk on Councils however reduces the control Councils have on price, and it would be expected that there would be penalties or increased gate fees associated with poorer quality material delivered.

There is an opportunity for Bundaberg Regional Council and Fraser Coast Regional Council to collaborate on the organic waste processing solution with expected similar commencement dates however this may depend on existing contracts.

4.3.6 Improved understanding of whole of region waste stream composition

There are a range of different organic wastes that could be collected across the region. Business as usual activities for Councils receive a large proportion of garden waste through the self-haul system including both the household and commercial streams which is composted to higher values uses or mulched with little residual value. Across the region garden waste will continue to be processed in this manner.

For Councils that decide to include additional collection systems including the FOGO stream an opportunity is provided for composting activities providing a higher quality output than mulching. It is expected that a proportion or single stream garden organics will continue to be mulched and used by Council for operational purposes. Improved or refined data is required to support new systems, including the potential contribution of commercial food organics, and those that are not captured as waste (i.e., agricultural residues etc.,) but may support either public or private investment in new processing facilities. The work undertaken by the Queensland Government on organic material flows should be shared more broadly and used to support holistic discussions around potential feedstocks at a regional level not just limited to waste managed by Councils.

4.3.7 Market development

Market development activities are required to support both existing activities through mulching and the compost product to be produced by the organics processing facility. Whilst there is confidence that a market exists, or links with offtakers can be identified, further work is required to connect supply with potential users. This can be facilitated by individual Councils, through procurement of product for use within urban amenity and by the Queensland Government where recycled organics can be deployed in the road reserve. Use in agriculture may require further refinement of offtake product, strong quality management, and a period of trial with agricultural users to demonstrate product quality. Mulched product, though likely lower value, also has been challenging for some Councils to find a market for. The price of any organic waste processing derived product varies significantly with quality, with a range of between $0 and $130 suggested, the higher value where the product can be deployed locally in agriculture. The establishment of a market for high-quality product should be a consideration of business case activity, as it can determine the processing technology required.

If Councils, choose to follow the service fee approach then ability to influence the market is restricted to purchase of recycled organics product for use in landscaping or amenity purposes. Organic waste derived products have high demand for deployment in agriculture in the region.

4.3.8 Approach to behaviour change and education

For organic waste there are two clear elements for action. Behaviour change aligned to the Queensland Government supported campaign options like Love Food Hate Waste[44] program will support the entire region reduce the amount of food waste generated and proportions of food waste in waste. It is expected and essential that the Department of Environment and Science will provide support through resources, both financial and collateral, to allow regional delivery.

This messaging should be delivered at a regional scale, initially through the establishment of a regional waste education strategy, to allow all Councils to participate fully and allow economies of scale in messaging, however in the region it was also highlighted that individual Councils may need to tailor education packages to their own needs, whether specific to new collection or processing systems, community and business focused, or timeframes associated with other engagement activities.

For individual Councils messaging around existing services may be targeted to improve the quality of self-hauled garden waste provided to Council transfer stations, as this has an implication on mulch product quality. Where Councils approve the introduction of a kerbside organics collection a specific education and awareness campaign in the lead up to commencement will be required. It is expected that education coupled with behaviour change or enforcement activities will be required to ensure compliance with scheme requirements and to take actions to minimise contamination. Specifically in relation to penalising poor behaviour it is expected and essential that the Queensland Government will take the lead on legislating penalties, rather than individual Councils being required to introduce new penalties into local laws.

4.3.9 Regional collaboration on community initiatives to reduce organic wastes

The potential to support or develop trials for community composting, specifically in parts of the region that are unlikely to move to a kerbside organics service in the immediate term, is identified as an opportunity to allow residents to participate in organics diversion activities and is consistent with the Organic Waste Action plan. There are activities such as licensing arrangements, identifying sites, and procedures to encourage community composting that are better suited for development by the Queensland Government than by individual councils.

[44] Fraser Coast Regional Council already subscribes to Love Food Hate Waste

4.3.10 Tackling problem organic wastes

Regional collaboration to assess jointly higher order end uses in the region for recycled organics derived from green waste were identified as an opportunity. Additionally, the development of an approach to managing biosolids, although not necessarily a critical issue at present, noting successful projects in South-East Queensland (for example the Logan City Biosolids Gasification project or an Urban Utilities project pelletising biosolids for use as a fuel), particularly with the potential for regulatory change regarding the presence of emerging contaminants in biosolids. Gympie Regional Council is reviewing options for managing biosolids through co-digestion, which may have benefits for the whole of the region.

4.4 Expected outcomes

For this Plan, there are clear environmental and social benefits to implement new kerbside organic waste collections and processing solutions throughout the region, however there is no clear economic incentive for Cherbourg Aboriginal Shire Council, Gympie Regional Council, North Burnett Regional Council or South Burnett Regional Council to implement such a solution. There are expected benefits for Bundaberg Regional Council and Fraser Coast Regional Council to progress the development of an organic waste collection and processing solution which will commence when practicable and approved by individual Councils.

A FOGO collection service by both Bundaberg Regional Council and Fraser Coast Regional Council is predicted to capture a combined 27,500 tonnes (initially upon commencement), rising each year through sustained investment in education and as population grows. Other councils may introduce their own services, and build their own processing facilities, or take advantage of existing facilities. The outcome in this Plan assumes:

- A new FOGO system captures 35% of food organics and 85% garden organics from the residual bin[45] estimated to be 2,092 tonnes of food waste and 7,850 tonnes of garden waste diverting a combined 9,942 tonnes of organic waste from landfill in Bundaberg Regional Council, and 2,092 tonnes (food) and 6,261 tonnes (garden) diverting around 8,911 tonnes of organic waste from landfill in Fraser Coast Regional Council.
- Additional garden organics captured with the provision of a new kerbside service (i.e., some material may currently be managed at home or that is currently self-hauled is captured in the new FOGO service, estimated at 8,700 tonnes.
- This includes the impact of education as well as the capture of existing food and garden organic waste currently in the residual bin, plus additional garden organics added to the system by residents.
- After implementation, across the region, there would still be an estimated 21,200 tonnes of organic waste in the residual bin.

Should Cherbourg Aboriginal Shire Council, Gympie Regional Council, North Burnett Regional Council or South Burnett Regional Council decide to introduce a new kerbside organics service benefits based on volumes could generally be scalable, however due to distance and need for additional composting infrastructure costs could escalate significantly. The addition of a FOGO collection service for all other councils would add an extra 1-2% to the MSW kerbside recovery rate and likely have marginable impact on the regional recovery rate for all streams.

Figure 13 provides an estimate of the annual cumulative tonnes of FOGO waste collected through the potential Bundaberg and Fraser Coast FOGO collections. The lines are a reference mark showing the total amount of FOGO waste currently in the residual bin.

[45] RAWTEC, Analysis of NSW Kerbside Green Lid Bin Audit Data Report 2020

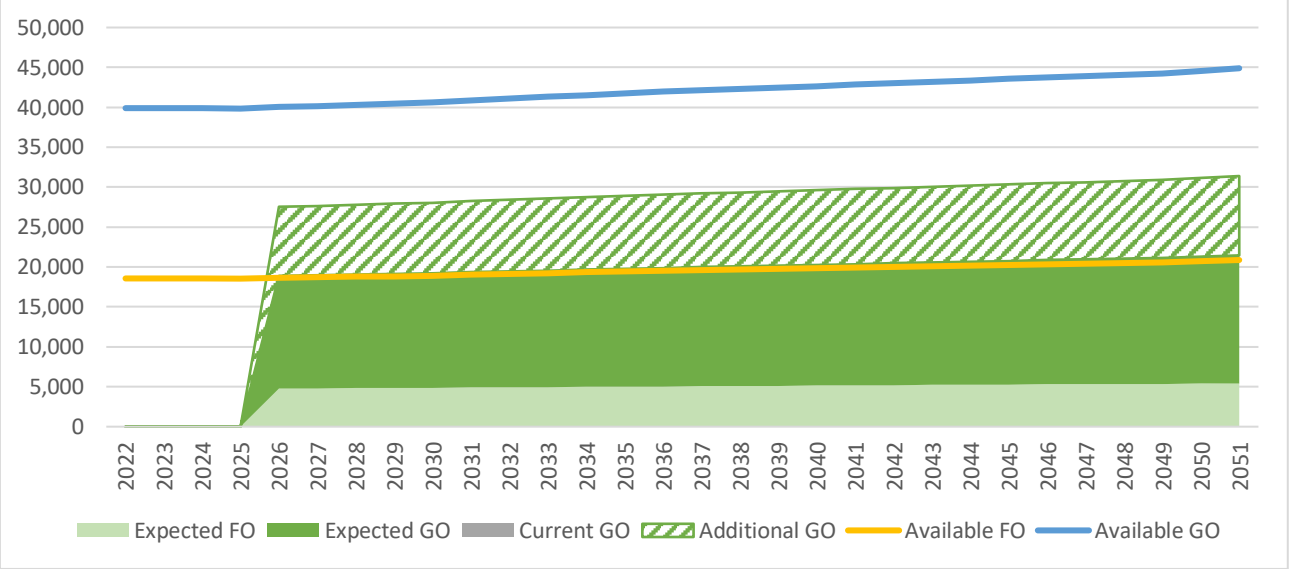


Figure 13 Future State for kerbside organics collections

Community composting is considered to provide a modest reduction in the food waste reduction where applied across the region, however overall, the combination of existing green waste processing across the region, growth of community composting and FOGO collection and processing service in Bundaberg and Fraser Coast is estimated to improve the MSW kerbside recovery rate from 18% to 42% and contribute an additional 5% growth in the regional recovery rate from the current 52% to 57%. New FOGO services could divert an estimated 96,000 tonnes from landfill, between FY26-27 and FY30-31. The estimated emissions savings from organic waste diverted from landfill to composting is 149,000 t/CO^2e over this period.[46]

Table 17 summarises the expected outcomes for the region in implementing the Regional Waste and Resource Recovery Plan regarding organic waste.

Table 17 Expected Outcomes – changes to organic waste performance

Metric	Current (FY20-21)	Forecast 2030	Forecast 2040
Household organic waste recycling rate (kerbside)	0%	24%	26%
Household organic waste diversion tonnage (kerbside)	0 tonnes	28,000 tonnes	30,000 tonnes
Contamination rate	No service	<5%	<5%

[46] Australian Government, Department of Climate Change, Energy, the Environment and Water, 2022. Australian National Greenhouse Account Factors, November 2022 – direct comparison between processing technologies only.

4.5 The cost of making the change

Economic analysis undertaken to support the Plan has identified that the expected cost of making the change at a regional scale or for individual Councils would include:

- Capital, operating and lifecycle costs – for sending organic waste to a 3rd party organic processing facility and paying a gate fee, plus collection, transfer, and bulking infrastructure (if required for transport to a centralised facility). These costs also include one-off costs for the delivery and distribution of new bins for households. Costs may vary depending on the processing technology. For example, costs of anaerobic digestion or covered aerated/inoculated static pile have significantly higher capital costs than an open windrow system.
- Transport costs – these include both the delivery of new kerbside collections and transport to a facility in region; and an assumed reduction in the frequency of weekly residual waste services to fortnightly to partially offset the increased cost of the new collection.
- Education costs – education costs commencing before the establishment of new services and assumed to continue through service provision to support the change.

This analysis includes a rapid cost benefit analysis. For implementation of the organic waste component of the Plan, it was assumed that existing organic waste processing facilities in the region would be utilised by Bundaberg Regional Council and Fraser Coast Regional Council and so Councils would pay a gate fee. This would be supported by new kerbside collections, assumed weekly, offset by a reduction in the residual waste collection services to fortnightly collections for those households receiving an organic waste collection service. It was assumed that the kerbside FOGO collection service would be rolled out to 80% of households in Bundaberg and Fraser Coast.[47]

The estimated whole-of-life cost for the introduction of FOGO collection and processing services in Bundaberg and Fraser Coast LGAs, over a modelled 30-year period is estimated to be **$153.5 million** (present value[48]) or annualised at **$55 per household per year** over the whole period compared to business as the business-as-usual scenario. In summary:

- The kerbside collection cost is estimated to be **$48.5 million** (present value) reflective of the addition of 52 weeks of FOGO kerbside collection and reduction of 26 weeks of residual waste collections over the period.
- Assuming Council's pay a gate fee for processing, the estimated cost of processing forecast collected organic wastes is **$105 million** (present value) over the forecast period. This assumes an initial gate fee of $110 per tonne for a simple windrow facility in the region at an existing facility.
- Initial one-off costs for the purchase of new bins and other consumables (kitchen caddies, liners etc.,) estimated to cost **$2.7 million** for Bundaberg Regional Council and **$3.1 million** for Fraser Coast Regional Council.[49] These costs may vary depending on the final service configuration and decisions made by Councils (e.g., provision of liners for caddies) and the point when they are purchased.
- Additional one-off costs may be required to replace existing residual bin lids with Australian Standard red lids, estimated at between $11-$21 per household, although it is assumed that these can be replaced progressively as bins are replaced.

[47] A blanket 80% of households value was used to estimate uptake of new FOGO collection services. It is noted that as Councils develop their own detailed business cases this coverage will vary depending on their own geographic coverage and service decisions.
[48] Note whole of life costs are discounted at a rate of 7% per year and presented as present value costs.
[49] Cost based on $84 per household establishment costs

- Education costs (included in the OPEX costs above) associated with the introduction of a new kerbside organic waste collection service are estimated to be **$0.27 million per annum** for Bundaberg Regional Council and **$0.29 million per annum** for Fraser Coast Regional Council, assumed to start up to 2-years prior to commencement of a full service.

It is assumed that FOGO collection would be impracticable to introduce at this stage in Cherbourg Aboriginal Shire Council and North Burnett Regional Council due to scale and cost. It is also assumed at this stage that Gympie Regional Council and South Burnett Regional Council do not have the economic driver (i.e., 100% annual advanced payment meaning levy cost is not realised) to add additional kerbside collection services. Nothing in this Plan or modelling undertaken precludes any council from deciding to implement a kerbside organics collection service.

Further refinement of the cost estimate would be expected as initially Councils establish whether there is a clear benefit for collaboration between Bundaberg Regional Council and Fraser Coast Regional Council. There may be benefit in collaborating on project management, education, and collectively pooling feedstock to avoid duplication of cost.

Additional costs may be incurred in implementing the plan for:

- Support required to implement food waste avoidance education and behaviour change. This is included within whole of region education costs alongside activities identified in **Section 5**.
- Costs associated with developing a regional or individual council studies for problematic organic wastes such as biosolids and timber.
- Costs associated with the roll out of at home composting solutions such as worm farms or compost bins. This is assumed to be a whole of state response coordinated by the Queensland Government.
- Costs associated with the establishment of community compost facilities within communities in the Wide Bay-Burnett Region. This is assumed to be a whole of state response coordinated by the Queensland Government.
- Updates to material flow analysis commissioned by the Queensland Government to provide a snapshot of current material flows, demand and supply across the region and neighbouring regions to maximise the potential for reuse and recycling in the region.

A breakdown of expected costs for implementation of this Plan is presented in **Appendix D**.

4.6 Supporting the change

4.6.1 Getting to the decision point for investments

Councils require a significant understanding of the business case for delivering new service before making a decision that affects their ratepayers. The preparation of a business case for a proposal requires significant investment in time and potentially the procurement of specialist economic, engineering, and other technical services. Future funding requests associated with the implementation of this Plan will likely require a gateway approval from State Government entities, who will expect documentation of a high standard to support any application.

4.6.2 Funding support for Capital Expenditure

The introduction of a new kerbside organics service in the region will cost more than the current service offering to provide additional collections and support gate fees or operational costs at a new processing facility. This includes preparing business cases that will consider existing fleet capacity and capability in the context of an additional collection service, and the establishment of a new organics processing facility. Ownership and delivery of the latter are to be established, but whether Council or privately owned, capital costs are expected to be significant.

A new organic waste processing facility may be located within a Precinct or existing industrial zone land. Support will be required from the host Council or from the Queensland Government to facilitate the establishment of the precinct to support organics or other resource recovery activities (see **Section 5**) which may be financial, planning and approvals. This includes a clear role for the Department of State Development to support establishment of both enabling infrastructure and industry attraction for new businesses to fill the precinct. There may be benefit in locating an organic processing facility in a future precinct development. The cost of the enabling infrastructure is included in the whole of life cost estimate, however broader precinct costs would require additional investment.

4.6.3 Behaviour change and education support to support food waste avoidance

Central to this Plan is the establishment of regionally focussed education and behaviour change programs. Engagement is required, plus the potential for support through partnerships with the State Government to fully recognise the benefits of a food waste avoidance program, and other behaviour change activities under the National Food Waste Strategy. This should be extended not just to new programs, but for existing services such as self-haul green waste to ensure product quality targets can be met.

4.6.4 Clarity of regulation

Clarity is required around regulation of sites processing food waste (FOGO) at scale as this has a cost implication on ratepayers as well as siting of facilities. Immediate clarity is required from the Queensland Government to ensure clear and transparent application of legislation that enables rather than hinders the establishment of organics processing facilities. This includes providing certainty on the type of facility required to process FOGO. Clarity is also required to how the Queensland Government intends to use landfill disposal bans about organic waste. This need for clarity or certainty also extends to how emerging contaminants (e.g., PFAS) potential in organic waste derived products are managed.

4.6.5 Setting the parameters of community composting

Community Composting could be deployed throughout the region, including in remote and regional communities. Whilst unlikely to have a high cost, consideration of funding for the development of state-wide education and information resources, education staff support, and support to facility community action should be provided by the Queensland Government. Priority should be given to Councils and populations without access to an organic waste service in the first instance, however documents and guidance should be available to all.

4.7 Timeframes

The proposed timeframe for implementation of the organics stream are:

Table 18 Organics implementation timeframes

Immediate action (ASAP)	Within next 5 years	Within next 10 years
Education & Behaviour Change		
ALL: Development of Regional Education Strategy incorporating food waste avoidance behaviour change program (all) as well as specific education for new services or re-enforcing existing rules (e.g., around self-hauled green waste)	Update and continuation	Update and continuation
DES + Councils: Consider how State based legislation/regulation or individual council action may need to be implemented.	DES + Councils: Implementation of agreed approach	Continuation
	ALL: Support state-based roll out of at home composting or worm farm equipment subsidisation (pending State funding & administration) linked to avoidance and broader education needs.	
Collections		
Bundaberg Regional Council and Fraser Coast Regional Council (pending Council approvals) will further progress plans for kerbside organic waste collection including detailed cost estimate.	BRC and FCRC (pending Council approval) commence modified kerbside organics collection at point where optimal. ALL: Review potential for long-term regional or sub-regional collaboration to collaborate on collection contracts	BRC and FCRC continue to deliver. ALL: monitor policy position.
Processing solutions		
ALL: Continue to process green waste under BAU	ALL: Continuation	ALL: Continuation
ALL: Collaborate with DES to develop guidance on community composting	ALL: Implement community composting where feasible and guidance allows	ALL: Continuation
BRC and FCRC collaborate on potential procurement of organics processing solution.	BRC and FCRC: implement preferred processing solution to coincide with commencement of collection service.	BRC and FCRC: Continued implementation. ALL: other councils to monitor opportunity to utilise new facilities.
ALL: Commence discussions regarding to the potential for alternative solution to land application for biosolids	ALL: Implement alternative solution for biosolids if triggered by change in regulation or economics	ALL: Continuation
Market development		
BRC & FCRC: As part of feasibility study or business case identify likely opportunities to purchase recycled organics from organics processor(s).	BRC & FCRC: Procurement of recycled organics for use in council projects.	BRC & FCRC: Continuation
Data & Information		
ALL: Work with DES to refine data associated with non-council managed organic waste within region and identify opportunities to collaborate on processing or supply. Collaborate as part of overarching data strategy.		

Cells in GREY indicate action not expected to commence during the timeframe, BRC-Bundaberg Regional Council, Cherbourg Aboriginal Shire Council, FCRC-Fraser Coast Regional Council, GRC-Gympie Regional Council, NBRC-North Burnett Regional Council, SBRC-South Burnett Regional Council; ALL: Indicates collaborative activities for all councils to participate in.

4.8 What could affect implementation?

The following variables could affect implementation of the organics comment of this Plan:

The following variables could affect implementation of the organic waste component of this Plan:

- Changes to regulation or rules relating to the processing of food wastes within composting facilities, and in particular the stipulation of technology type specific to this processing.
- The updating of Australian composting standards (e.g., AS 4454 Composts, soil conditioners and mulches) with more stringent controls associated with the nature of emerging contaminants or other issues that hamper the distribution of recycled organics, including products derived from organic waste.
- The price of recycled organics product (e.g., compost, etc.,) can vary significantly. The typical compost product generated by existing composters running FOGO projects in Victoria and NSW may achieve only $20/tonne for their outputs, whereas high-quality (and low contamination) outputs reported in strong agricultural market areas may achieve up to $120 per tonne. The establishment of high-quality output producing facilities coupled with market development activities could achieve a lower overall whole of life cost for organics diversion.
- Changes to the landfill disposal levy (i.e., incremental prices in levy rate greater than CPI) or annual advanced payments could impact the viability of decisions made to support this Plan, including making the economics of kerbside FOGO collection more or less viable.
- The Queensland Government are considering the potential to introduce landfill disposal ban for certain types of wastes including organic wastes. The introduction of a ban on organic waste to landfill (either holistically or for single streams) would support the establishment of a local or regional scale infrastructure. For those Councils with existing landfill gas to power generation facilities a ban on organic waste to landfill could potentially affect the commerciality of these systems, although this would also support a general reduction in greenhouse gas emissions from landfills and promote diversion.
- The expectation in implementation of the education and behaviour change components of the Plan imply reduction in food waste as well as a movement towards low levels of contamination in organics collection services. This will require ongoing effort and financial commitment to reinforce this messaging throughout delivery of the service offering.
- Incorporation of other organic waste streams could allow for growth of proposed processing facilities over time (e.g., commercial food waste, agricultural wastes, timber etc.,)

5 Material recycling and recovery

This section is intended to capture actions and interventions associated with the kerbside recycling scheme and materials recovered or potentially recoverable and recyclable across the region. Challenges in recent years for the kerbside collected bin have stemmed from restrictions on the export of mixed recyclables firstly due to restrictions in China and other receiving countries due to quality or contamination issues, and more recently due to the implementation of export bans on certain unsorted waste streams imposed by the Commonwealth Government. This section considers:

- The existing dynamics of the recyclable waste stream in the Wide Bay-Burnett Region
- Potential levers and interventions
- Major options considered
- The expected outcomes of the preferred options
- What is required to support the change; and
- What may change during the implementation of the Plan

5.1 Waste stream dynamics

All councils except North Burnett Regional Council offer a kerbside commingled recycling service. There are three MRFs within the region, at Bundaberg, Hervey Bay and at Cherbourg, with a new MRF under construction by Fraser Coast Regional Council in Maryborough. All councils provide transfer facilities for self-haul recycling.

In FY20-21, 200,572 tonnes was reported as recovered, of which the household kerbside collection of dry recyclables contributed 19,478 tonnes. A further 180,994 tonnes is self-hauled to council managed facilities within the region comprising 5,406 tonnes of household, 13,819 tonnes of C&I and 161,869 tonnes of C&D waste (of which 134,000 tonnes is reported as clean earth). **Figure 14** presents a breakdown of estimated quantities, combining audit data with projections.

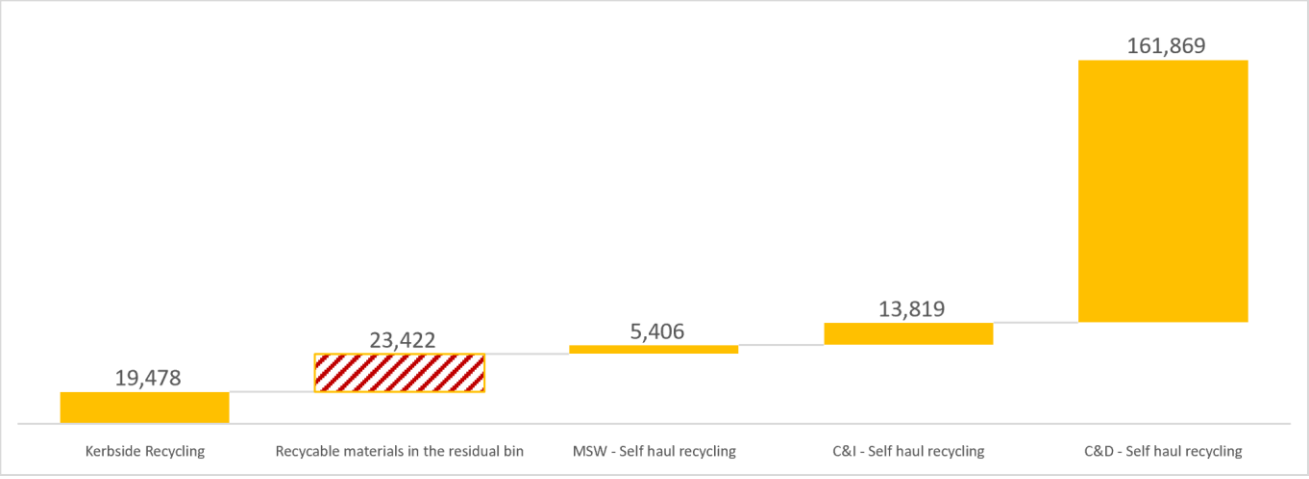


Figure 14 Proportion of recyclable material forecast in each source (FY20-21)

The overall recovery rate (including organic waste) reported in FY20-21 was 38% for the MSW stream. The overall recovery rate for the C&I stream is 29% and the C&D stream is 83%, although it noted that approximately 80% of C&D waste recovered in the region in FY20-21 was clean earth.

Contamination in the yellow-top bin is a significant issue across the region with rates across the region ranging from 16-18%.[50] Contracts MRF operators typically have penalties in for exceeded contamination, and this also can affect downstream quality and price of MRF sorted materials.

Waste education is provided across the region which strives to drive the avoidance of waste and drives better performance in existing services. Waste education provision is dependent on funding and resource availability, with larger Councils having greater resources. All kerbside collected materials is sorted via existing MRFs and then further processing and remanufacturing is undertaken outside of the region.

Some self-hauled C&I materials are recovered within the region, although recovery rates are low. Wastes in the C&D stream achieve a regional recovery rate of around 83% already, with Councils recycling and recovering large proportions of this material. The levy, operational since 2019 is likely to have driven this diversion rate with a common response observed across the state. This stream already exceeds the target for 2025 and is marginally below the 2030 target of 85% recovered, suggesting significant further intervention is not required.

Although Councils in the region manage a relatively high proportion of non-household waste, private sector businesses operate in the region, including providing waste collection services on behalf of some councils. Whilst some of this data has been captured in the forecasting, it is likely that there are gaps in the reported data for private sector operations not captured in the annual waste data survey by the Queensland Government. These gaps may represent opportunities for material that could be processed locally.

5.2 Levers and interventions

5.2.1 Refuse, reduce, avoid, and reuse through education

For kerbside collection, education of households is critical for reducing contamination. The Queensland Government is currently (as of mid-2023) preparing a behavioural change campaign under its State Education and Behaviour Change Initiative (EBCI) which is understood to include Statewide advertising as well as toolkit resources to be deployed locally at a regional or individual Council scale. Education around putting the right thing in the right bin will not necessarily impact recovery rates, so education around what can and should go in the recycling bin is also critical. Likewise helping residents understand what happens to their recycling and validating that it is recycled and turned into new products is critical, as is understanding what non-kerbside recycling options may also be available. By extension the there are numerous reuse and “op” shop type facilities across the region. These facilities could grow their scope to include preparation of certain recyclables for further transport and processing. A critical need for education is not just initial funding, but ongoing funding throughout the lifetime of this Plan.

[50] Contamination rates provided by Councils based on most recent audit data and as reported in QWDS.

5.2.2 Policy and legislation

At a national scale the phase out of materials, especially plastics or other packaging materials that are harder to recycle would help to drive better quality in the commingled bin; however, this cannot be controlled by those collecting the waste locally and requires Queensland and Commonwealth Government negotiation and intervention. The waste industry, including both Councils and private industry are responsible for managing the end-of-pipe products produced and consumed by residents and visitors to their regions and Council areas. As such they can have limited impact on the materials that flow through the economy and ultimately become waste. Alignment with upcoming recommendations regarding harmonization of bins should be incorporated, where relevant to the services offered, noting that a case for a separate glass collection as currently being implemented in Victoria does not appear to offer significant benefit to existing arrangements and infrastructure. More assistance is needed from the Queensland and Commonwealth Governments on this front.

There are several circular economy transition changes currently being progressed that may achieve some of the higher order 10Rs before the material becomes waste such as changes to right to repair legislation. These activities over time may impact the material flows eventually becoming waste, most likely through delays or keeping products in use for longer.

5.2.3 Regulation and enforcement

Enforcement activities will support education, but Councils need to be able to enforce requirements or even penalise repeat offenders. This could be undertaken under either local laws, or preferable consistent laws at a state-level to allow repeat offenders to be penalized for their repeated poor behaviour. This could include the introduction of alternative pricing systems or potential removal of service.

5.2.4 Collection systems

Collection systems for materials that can be recycled or recovered (excluding organics and residual waste which are addressed in other sections) rely on a combination of kerbside recycling collections or via the self-haul system. Private sector operators undertake collections within the region, although typically this is understood to be for niche wastes (e.g., liquid regulated wastes), for businesses with multi region collection contracts, or where they are contracted to provide a collection service on behalf of a Council. Councils often end up managing large amounts of the non-Council collected waste at resource recovery facilities.

Enhanced material recovery and recycling also requires improvements to self-haul facilities to for both household waste and that generated by the private sector operators, particularly in parts of the region where Councils manage a high proportion of the C&I and C&D stream. This would include better segregation and separation of problem wastes which typically end up in landfill such as tyres, timber, mattresses, e-waste, paint, and construction wastes. Separation of these wastes needs to be supported also by existing or future product stewardship schemes providing a service to all Councils, and not just those on major routes, or subsidising the transport from more regional areas into a centralised hub to allow collection and reprocessing.

In areas where there are kerbside services there are numerous household hazardous waste products (e.g., mattresses, paint tins, batteries, household chemicals etc,.) that cannot be collected from the kerbside, but often end up in the yellow top bin as contamination, or the residual bin where they can cause issues such as fires or contamination. Education can support the non-inclusion of this material in kerbside service bins, but a clear pathway for these materials to be recycled at Council transfer stations should be expanded. Dedicated household hazardous waste transfer facilities (such as the NSW Community Recycling Centres (CRCs)) would help facilitate better capture of these materials. In NSW such facilities are state funded, and there is a clear role for the Queensland Government to support establishment of facilities across the region.

Alignment with an expanded Container Refund Scheme with the updated scheme capturing wine and spirit bottles from late 2023 helps to remove lower quality items, as well as items that cause contamination of other streams (e.g., broken glass to paper/card) helps to further improve the quality. These changes may impact the flow of material into the recycling processing solution which in turn have a material impact on processing contract rates (i.e., less volume being processed typically increases cost to Councils for processing). Councils estimate that annual weight reduction through MRFs may amount to 10-15% less because of the change.

5.2.5 Processing infrastructure

Material recovery facilities typically process and sort wastes. With the new MRF in Maryborough is expected to be operational by mid-2024, it is considered that there are sufficient MRFs with capacity to meet the needs of improved kerbside sorting and commingled recycling. The new MRF in Maryborough has been designed to allow increased throughput to become a regional scale facility in the future, as required. Therefore, it is not proposed for new MRF infrastructure to form part of this Plan, although it is identified that glass processing and washing technology would be beneficial in the region.

Following sorting at an MRF, or taking materials collected individually under specific schemes or at Council transfer facilities, material can be reprocessed into a resource. These reprocessing facilities take pre-sorted materials and change their physical and/or chemical nature, adding value to the processed material so that it can become a feedstock for a manufacturing process or otherwise re-enter the economic cycle.[51] Reprocessing facilities typically manage single-stream materials such as paper, cardboard, plastics, glass, timber, metals, batteries, e-waste, tyres, and oils. The Recycling Enterprise Precinct Location Strategy suggests there may be opportunities for organics, C&D waste, and solar panel recycling within the region. **Table 19** presents indicative processing costs for different types of processing based on published documentation.

Table 19 Indicative Costs for Reprocessing

Item	Capacity tonnes per year	CAPEX	OPEX per Year	Reference
E-waste processing – batteries	4,000	$1.75 million - $2.2 million	$250,000-$300,000	Infrastructure Victoria, 2020[52]
E-waste processing – batteries, monitors, and televisions	5,500	$2.8 million - $3.4 million	$400,000-$500,000	
E-waste processing – solar panels	5,000	$1.5 million - $10 million	$250,000 - $550,000	Infrastructure Victoria, 2020[52] Council provided information
Glass beneficiation	108,000	$8.1 million - $13.34 million	$1.5 million – $2 million	Infrastructure Victoria, 2020[52]
Glass – sand/aggregate plant - crushing/grinding/washing	10,000	$3 million – $7 million	$500,000 - $1 million	
Small scale paper and cardboard processing	20,000	$3 million - $3.5 million	$300,000 - $400,000	
Medium scale paper and cardboard processing	50,000	$8.5 million - $10 million	$750,000 - $850,000	
Plastics processing – flaking and pelletising plant	10,000 – 20,000	$6 million - $14 million	$1 million-$2 million	
Tyre processing	15,000	$6 million - $8 million	Unknown	

[51] Queensland Waste and Resource Recovery Infrastructure Report 2019
[52] Infrastructure Victoria, Waste and Resource Recovery Infrastructure Gap Analysis, 2020. https://www.infrastructurevictoria.com.au/wp-content/uploads/2020/05/2.-Resource_Recovery_Infrastructure_Gap_Analysis_Final_IV.pdf

Costs indicative based on published information, Council provided information, or consultant benchmarked data.

The establishment of post-processing infrastructure can be supported by Councils, working with industry and Queensland Government agencies to reduce barriers to entry. The establishment of precinct type infrastructure allowing short transport distances between MRF and post-sorting processing, and the provision of long-term leases on prepared, connected (e.g., to services) and appropriately approved or zoned land can also facilitate the reduction of barriers for processing infrastructure. Councils may play a facilitation role.

5.2.6 Market development

At the moment most MRF processed recyclable (glass, paper and card, plastics, metals) material is sent out of region. Exported recyclable material is typically taken to South-East Queensland and beyond to be processed into new material. Whilst this remains a good outcome, there may be opportunity to establish new industry to process this material in region, thus creating secondary markets and minimizing the long-distance transport of waste. But this requires private sector investment where Council and State Governments' role is to facilitate through identification of land (e.g., in precincts) or for utilities connections, and provide certainty of supply that gives industry the confidence to invest.

Councils and the State Government can support demand for recycled content through their own procurement policies and strategies. When the levy commenced in Queensland in 2019, support was also provided to councils to support the transport of recyclables from regional centres to reprocessing facilities. The Queensland Government should consider reintroducing this program to support implementation of this Plan.

5.3 Major options considered

Options are limited for commingled collections where existing contracts are active. Education is critical to help lift the quality of material that enters the post-collection recyclate processing service via the kerbside bin, but also to ensure dangerous materials do not enter any other bin.

Table 20 Major recyclable waste decisions

Decision area	Business as usual	Options			Rationale
Increasing coverage of kerbside collections	Kerbside collection in all councils except NBRC	Current level of service	Increasing number of households serviced in each Council area	Expand service to all Councils	Existing services may grow as population/dwellings grow. SBRC recently commenced kerbside collection.
Getting more from kerbside recycling	Current recovery rate is 20% for kerbside MSW	No significant action	Individual Councils take action to address	Significant action – addressed at regional scale	Bin audits indicate a further 24,000 tonnes of the residual bin could be diverted into the kerbside commingled bin.
Reducing contamination	Current contamination rate is 16-18%	No significant action	Individual Councils take action to address	Significant action – addressed at regional scale	Including support from DES, behaviour change focussing on getting more from the kerbside bin and reducing contamination.
Enhanced and improved transfer facilities	Transfer facilities in each LGA	No significant action	Significant action – individual councils upgrade transfer facilities where needed	Significant action – regional scale transfer facilities	Upgrade and enhancement of transfer facilities in each LGA to better segregate and aggregate recyclable wastes and participate in product stewardship scheme.
Regional collaboration on future MRF and kerbside collections contracts	Existing commercial MRF with individual supply arrangements	No regional collaboration on single MRF	Sub-regional collaboration on single MRF	Regional collaboration in future for regional MRF as required	No need for new MRF at present with Maryborough MRF soon to be operational. Potential for new FCRC MRF to act as regional MRF in future if required
Improve knowledge of material flows for recyclate in region	Data held by DES/Councils limited.	No significant action	Individual councils develop material flow analysis for each LGA	Regional collaboration to identify other feedstocks or materials within region to facilitate localised industry	Current gap in C&I and C&D stream plus other non-waste materials within region. Seek opportunity with DES to improve knowledge to facilitate establishment of new facilities to process regional wastes.
Increased recycling and post-processing technology	Limited recycling or post-processing infrastructure	No significant action	Individual councils attract new technologies and providers to LGA	Regional collaboration for new technologies and consideration of location	Need to attract and support establishment of new processing infrastructure for wastes not currently recycled.
Establish a regional precinct	No existing precinct	No significant action	Establish individual recycling facilities in each LGA	Regional collaboration on precinct including hub and spoke approach	Working with State Development and Councils to develop precinct and attract new recycling and secondary processing industry to region.

Cells in YELLOW reflect decisions made, BRC – Bundaberg Regional Council, CASC – Cherbourg Aboriginal Shire Council, FCRC – Fraser Coast Regional Council, GRC – Gympie Regional Council, NBRC – North Burnett Regional Council, SBRC – South Burnett Regional Council

5.3.1 Behaviour change and education are critical deliverables

Bundaberg Regional Council, Cherbourg Aboriginal Shire Council, Fraser Coast Regional Council, Gympie Regional Council and South Burnett Regional Council currently provide kerbside recycling services to most dwellings within their respective LGAs. There will certainly be opportunities to grow the number of services as population grows over time, however it is generally considered that coverage is optimal when balanced with the cost of collecting from areas with very low population density with trucks travelling long distances. The cost associated with introducing a new kerbside recycling service in the North Burnett Regional Council area would yield less than an estimated 450 tonnes per year across the whole LGA and so a new service here was also not warranted.

There is an opportunity, through education and enforcement, to both reduce the level of contamination in the kerbside collection recycling bin whilst also increase the volume of acceptable recyclable materials collected. What enters the yellow top bin will be captured to a degree by a proposed state-wide education campaign encouraging behavioural change. This is funded by the Queensland Government at $17M for the next 4-years (to FY26-26) and will include partnerships opportunities for Councils to participate further. There may be a cost to participate, and it might be reasonable to assume the deployment of additional staff to support the campaign which may require financial support, with necessary funding support needed to extend beyond 4-years. This could be from direct funding, the procurement (and funding) at a regional scale, or the allocation of resources procured centrally by the Queensland Government. Regional collaboration may help to gain efficiencies in the roll out of this behaviour change approach. This package of behaviour change should explore use of consistent approach to continued poor behaviour as a last resort, which could be supported by modifications to existing Waste Management local laws enacted by each Council in the region.

5.3.2 Glass processing

It is proposed to develop a new glass processing and recycling facility at the location of the new MRF in Maryborough to support regional recycling. The estimated capital cost for glass processing technology is $6 million. Funding support will be required as part of implementation of this Plan to establish the new technology which can process and recycle glass from across the region.

5.3.3 Improved or new transfer facilities for community and business recycling

The new MRF in Maryborough will be operational during 2024, complementing facilities in Bundaberg and Cherbourg. Self-haul facilities receiving household, commercial and industrial, and construction and demolition waste streams represent a large proportion of waste managed in region. At an individual council level there is a need to improve the ability of facilities to capture problematic wastes to pull away from kerbside and offer opportunity to participate in recycling in areas where kerbside collection is limited (i.e., parts of LGAs where kerbside is not economic). Upgrades to other transfer stations may be required to facilitate better segregation of wastes, and arrangements, particularly in more remote locations, need to be in place to aggregate and transport wastes for reprocessing and recovery.

Upgraded facilities to segregate waste however are limited by the cost of transport, particularly the further a collection site is from aggregation or from processing infrastructure. In some cases, it may be considered economically beneficial to do nothing (i.e., stockpile) with this material, or dispose of to landfill than transport at cost. Regional transport assistance may be required to help support flow of material towards centralised sites, avoiding their loss to landfill but mitigating transport costs.

5.3.4 Improved knowledge of recyclable material in region

Data relating to the nature of waste captured at the kerbside is generally granular and of good reliance and captured by Councils through existing data management systems that flow through to the Queensland Government. Data quantity and quality is lower or absent for wastes not managed by Councils. This limits the visible feedstock available for certain types of waste that are expected to flow through the region, which may present an opportunity for localised processing. The Queensland Government has developed materials flow analysis for organic waste, e-waste, and textiles. The region will work with the Queensland Government to provide data and intelligence to update and support future material flow analysis to enable regional analysis to be undertaken to support new business establishment. It is noted that existing material flow analysis data, particularly in regional Queensland, is limited by confidentiality of data providers as aggregation is not usually possible.

5.3.5 Establish an enterprise recycling precinct and attract investment in new industry

A potential option within the region is to collaborate on a regional approach to the attraction, siting, and establishment of new recycling businesses. This includes collaboration with the Queensland Government to develop a Recycling Enterprise Precinct adopting a hub and spoke approach. Under this approach is the establishment of a centralised “Transform Precinct” where most primary and secondary processing will be undertaken, supported by “Prepare Precincts” within the region (and outside of region) where material is pre-processed prior to transport. Work has been prepared by the Queensland Government to identify a location strategy and guidelines to allow precincts to be developed in a consistent manner. Within the region, Bundaberg is identified as the potential location for the “Transform Precinct” with Cherbourg and Curra proposed for potential “Prepare Precincts” however further investigation is referenced in the location strategy to refine locations and understand further the demand for industry within proposed precincts.

Whilst the funding source for establishment of the precinct is uncertain, it is assumed that Councils will not be required to contribute to establishment fees. Councils can also support the establishment of facilities by providing certainty of supply for wastes that they manage which will contribute to feedstock assessments for business cases for new facilities.

To reduce barriers further support is recommended to support the transport of recyclable materials to spokes, or from spokes to the regional processing facility. This can help to support the establishment of new industry within the region. The Queensland Government has previously provided transport assistance for recycling, particularly in remote locations to facilitate greater resource recovery. Whilst long-term sustainability of logistics should be the aim of new business, support over a defined period may encourage investment.

5.3.6 Promoting the 10Rs hierarchy

Opportunities to promote higher order activities under the 10Rs framework should be sought in the region. This could include supporting resale or reuse of materials through existing tip shops on Council resource recovery facilities. Opportunities to repair and refurbish could be promoted in the region, either through identifying specific areas within a precinct site, or through the encouragement or establishment of repair facilities within individual Council areas. This should include working collaboratively with ratepayers to identify opportunities for services such as repair centres or cafes to be established. These likely require minimal funding but could be supported through education activities or minor funding for booking of locations (such as Men’s Sheds, PCYCs etc.). Funding for the establishment of community repair services should come from program funding by the Queensland Government.

5.4 Expected outcomes

At present 12,784 tonnes of kerbside recycling material is collected by councils in the region via two council owned MRFs in Bundaberg and Cherbourg, with new MRF to commence operation in Maryborough in 2024. Education to encourage greater use of the kerbside bin for household recyclables could reasonably divert a further 6,500 tonnes of material from the residual stream per year by FY30-31. The addition of a kerbside service by North Burnett Regional Council is considered unlikely as it would only add less than 400 tonnes for processing per annum and require collection across a large geographical area. Forecasting to support this Plan indicates that the volume of available material for kerbside recycling will increase to 28,500 tonnes per year by FY30-31, 33,000 tonnes by FY40-41 and 35,000 tonnes by FY50-51.

An important element of engagement and behaviour change is buy-in from residents within the participating communities. A region wide Education Strategy will be developed with investment from the Queensland Government to support both additional staff resources as well as funding for advertising to support implementation. This is important across all streams and gives ownership. Communities will be better informed as to what should go in their bin, and what happens to the waste that is collected. This education needs to be sustained and should not be viewed as a one-off intervention. Cherbourg Aboriginal Shire Council will develop their own community focussed waste education strategy.

Evidence from other regions suggests that education and behaviour change campaigns could reduce contamination in the kerbside commingled bin from the regional contamination rate of 18-20% contamination a target by of <5% by FY30-31. Whilst the Queensland Government is currently baselining contamination rates as part of a kerbside education and behaviour change program and initiative, which should define target contamination rates, other Councils in Australia have sought to achieve 2% contamination.[53] It is noted however the presence of contaminants such as glass fines may restrict contamination rates below 5%. Contamination rates would form a new baseline for the procurement of a new recycling processing or MRF contract for the region. This would also form part of the objectives of a regional Education Strategy.

Enhanced transfer facilities for non-kerbside waste will give residents better opportunities to participate and remove hazardous or harmful materials from the kerbside collected waste, protecting a new MRF or recycling solution contract, as well as reducing the potential for these materials to get into the organics and residual waste streams. Provision of these facilities should be dependent on the establishment of collection, processing and treatment systems for these wastes being available in region, or for transfer out of region. There is little benefit in providing better sorting and separation for there to be no processing available.

Table 21 presents the expected outcomes from the material recycling and recovery stream by way of metrics to measure the performance of this action.

[53] NSW Government, Department of Energy and Climate Change, 2007. Reducing Contamination of Dry Recyclables and Garden Organics at the Kerbside – The NSW Experience, https://www.epa.nsw.gov.au/~/media/EPA/Corporate%20Site/resources/warrlocal/070211-kerb-dry-recycling.ashx)

Table 21 Expected Outcomes – material recycling and recovery

Metric	Current (FY20-21)	FY30-31	FY40-41
Kerbside recycling rate (Proportion of kerbside waste collected sent for recycling excluding organics)	18%	25%	27%
Kerbside recycling tonnes (Material collected at the kerbside sent for recycling excluding organics)	19,478 tonnes*	28,500 tonnes	33,000 tonnes
Contamination rate (Contamination rate as reported by waste audits)	16-18% Requires baselining across the region	< 5%	< 5%

*Value does not include new service for South Burnett Regional Council which commenced in FY22-23. These are included in the forecast numbers.

5.5 The cost of making the change

The economic assessment considered the cost of incrementally adding to the intervention scenario described for organic waste in Section 4. The estimated costs for implementing the changes described for materials recycling and recovery include:

- Capital, operating and lifecycle costs – for the delivery and operation of a new material recycling solution within the region beyond existing business as usual costs, and processing facilities for local beneficiation. It is noted this does not include the establishment costs for a new precinct or capital costs for establishing new facilities which is assumed to be driven by private sector involvement.
- Transport costs – which include the ongoing increased cost in region from local improved transfer stations to a regional facility.
- Education costs to support behaviour change activities described in this section (assuming these would be delivered in tandem with organic waste behaviour change and new system implementation). Evidence collected during the development of this plan suggests approximately 5% of overall operating budget would be allocated to education to achieve best practice results.

Through analysis undertaken to support this Plan, the estimated whole-of-life costs for the proposed interventions of the material recycling and recovery stream is **$53 million** (present value) over the economic model lifetime.[54] This can be summarised as an incremental cost of **$19 per household per year** (present value) compared to the base case (and on top of the organics diversion cost per household for Bundaberg and Fraser Coast) In summary:

- Estimated capital expenditure of approximately **$6.5 million** for new glass processing and washing technology to be deployed, and ongoing operational costs for over the 30-year lifetime.
- Small scale improvements to transfer facilities have been estimated without formal assessment of need or build-up of designs. For this Plan, it is assumed the cost of upgrades will average $1.25 million in CAPEX, comprising **$7.5 million** in overall expenditure with resulting increases in OPEX and an allowance for transport. Councils may need funding support to develop specifications for design upgrades, which may be determined by the establishment of precincts within the region.

[54] Includes discount rate of 7%

- Allowances for funding supported improvements to provide household hazardous waste facilities, waste stream audit and other initiatives to support better segregation and understanding of waste flows in the region.
- Additional education costs will be incurred to both increase the capture of recyclable material at the kerbside (from the residual bin) and optimise levels of contamination. As part of a broader education strategy this could be developed at a regional level but implemented by each Council. Funding should support additional FTEs to provide education in partnership with the Queensland Government and partially under the Education and Behaviour Change Initiative. All councils should be able to access resources. Using the metrics discussed in Section 4, a further $8 per Household per Year is estimated to provide additional education funding across the region. Based on the total number of waste services offered across the region, this gives an overall per year estimate of **$1 million** to cover additional staff cost, marketing material and advertising. As a region there are clear benefits from working together on collaborative campaigns (in partnership with the Queensland Government) but it would be also reasonable for the distribution of funding to be allocated to a degree based upon scale (i.e., number of services) or population. Extrapolated over the period from FY23-24 to FY30-31 the overall funding required would be an estimated **$8 million**. This investment in education will need to be maintained on an ongoing basis beyond this period and this has been assumed in the waste flow and financial models.
- It is expected that Cherbourg Aboriginal Shire Council will require an individual community specific education and engagement strategy, working collaboratively across other services provided by Council.
- Within the economic analysis there is an additional cost is considered for the development of beneficiation facilities. There would be a capital cost to build such facilities, which could be aligned with the proposed precinct plans. The economic analysis includes new beneficiation facilities, noting the intent and allowance for new glass processing technology in the region. In the cost per household presented it is assumed the capital costs associated with the development of new beneficiation facilities would be funded by industry, potentially with industry support funding from the Queensland Government and would not have a direct impact on Council or householder cost, so these costs are excluded.

5.6 Supporting the change

For the material recycling and recovery stream getting better quality and greater quantity from existing services has a direct impact on overall recovery rates. The following supporting actions are required to move towards a future state for recycling:

- **Education resourcing and collaboration:** The Queensland Government has announced funding to support the development of a behavioural change and education campaign over the next 4-years targeting contamination of the kerbside comingled bin. At a regional scale Councils will benefit from collaboration to develop an approach, particularly for the three Councils currently providing a kerbside collection for recycling. Through a partnership approach with DES, support could be provided to roll out the campaign, whether funding for additional education staff resources or for materials and events.
- **Establishing regional precinct infrastructure:** The region in collaboration with the Queensland Government may progress the development of plans for a precinct to house resource recovery and secondary processing infrastructure. There are initial start-up costs associated with construction of a precinct, including planning, enabling infrastructure (roads, connections etc.,) that may present barriers to establishment or colocation of new resource recovery or secondary processing infrastructure. Both Councils and the State Government can support establishment of infrastructure at a centralised precinct hub, or at local spoke sites facilitating pre-processing and transport.

- **Upgrading or building new transfer, aggregation, and bulking facilities:** This Plan has identified the need to upgrade existing or build new transfer facilities within the region. This will facilitate the better separation of materials brought to local transfer facilities. This includes better separation of household hazardous wastes. New facilities designed to accommodate better separation, plus the potential for storage of collected material for longer to allow bulk transport would help to reduce the cost of transport but require capital investment. This also includes the potential for the Queensland Government to support the establishment of community recycling centres to target household hazardous wastes.
- **Offsetting transport costs for recyclables.** The hub and spoke approach, and collection of recyclable materials at transfer facilities will require the transport of these materials to either a precinct, or out of region for processing. Transport costs may require short-term support through grant funding to reduce barriers for supply to new facilities, however a long-term strategy may need to be developed to ensure viability of these arrangements in the medium to long term. Take back schemes or reverse logistics could also be explored to support transport of materials.
- **Procurement for recycled content.** Through updated local, Queensland and Commonwealth Government procurement, there is an opportunity to drive the uptake of recycled material demand by specifying use of recycled product in procurement documentation and tendering processes. The Department of Transport and Main Roads in Queensland has a significant opportunity to drive this process within the region.
- **Improved granularity and availability of data:** Data quantity and quality is generally good for Councils within the region, and through weighbridge transaction software records of transactional data have a high degree of reliability. There are gaps in the data set that limit the discussion with regard to the total volumes of recyclable material that flows through the region, which in turn hinders the development of new reprocessing or remanufacturing solutions. This includes the C&I stream for which there remains opportunities to reduce and avoid waste going to landfill. Whilst Councils in the region have provided some knowledge of private processing tonnes, records are not complete.

5.7 Timeframes

Table 22 Recycling Stream implementation timeframes

Immediate action (within next 2 years)	Within next 5 years	Within next 10 years
Education & Behaviour Change		
ALL: Development of Regional Education Strategy incorporating behaviour change and education associated with 1) reducing contamination and 2) improving recovery of the kerbside commingled recycling bin, working with DES to support behaviour change campaign. Options to refine messaging for all councils depending on	ALL: roll out and continued delivery of regional campaign associated with existing collections. Delivery mixed between region and individual councils.	Update and continuation
Collections		
ALL: Consider regional or sub-regional collections approach when contract expiry dates align.	ALL: Implement join approach (if in agreement) for collections to commence (if within next 5-years)	ALL: Consider new collection contract when existing expires within this period.
ALL: Develop business cases/plans for enhancements to existing, or new transfer facilities to facilitate better segregation of self-haul recyclables and capture household hazardous materials	ALL: With funding support, construct, and commission improved transfer facilities	Continued operation
Regional infrastructure & precinct		
ALL: Collaborate on establishment of a regional scale precinct (hub) with identification of site and location of potential feeder (spoke) sites across region.	ALL (funded by State): Construct enabling infrastructure for precinct (road, utilities, approvals etc.,) within Continue to collaborate on approach to providing feedstock to processing sites within precinct	Continued
Processing solutions		
ALL: Working with Queensland Government agencies establish and attract new resource recovery processing or secondary material processing facilities within precinct.	Continued support.	Continued support.
Market development		
	Queensland Government + ALL: Work with State Government agencies to improve update of recycled materials in procurement.	
Data & Information		
QGOV + ALL: Led by the Queensland Government, councils collaborate to obtain and understand material flow data from the region from council and non-council managed streams with a view to supporting establishment of recycling and reprocessing technologies in region.	ALL: Update and refinement under regional data strategy	ALL: Update and refinement under regional data strategy

Immediate action (within next 2 years)	Within next 5 years	Within next 10 years
ALL: Collaborate to collect data on contamination and materials within all kerbside bins to facilitate improvement. This may include regional or subregional procurement of audits facilitated by a governance body (if progressed)	Continuation	Continuation

Cells in GREY indicate action not expected to commence during the timeframe, BRC-Bundaberg Regional Council, Cherbourg Aboriginal Shire Council, FCRC-Fraser Coast Regional Council, GRC-Gympie Regional Council, NBRC-North Burnett Regional Council, SBRC-South Burnett Regional Council; ALL: Indicates collaborative activities for all councils to participate in.

5.8 What could affect implementation

This Plan provides certainty over the direction and actions required to support Queensland's Waste Management and Resource Recovery Strategy for the region. In the recycling space, flexibility or alternate delivery of the Plan may be necessary due to unforeseen circumstances, or potential challenges such as:

- Wine and spirit bottles will be included within the container refund scheme, which will further divert material from the kerbside recycling bin. If wine and spirit bottles are incorporated into the CRS, this will reduce the volume of material that needs to go to the existing, or a future MRF for sorting. A future MRF or kerbside collected recyclable processing contract would need to allow for this, particularly as glass reprocessing will still be undertaken at this private facility. The benefits seen for MRFs under this scenario is that MRFs with CRS processor capability will benefit from a separate income stream by processing CRS collected material. Conversely the removal of wine and spirit bottles may increase the proportion of contamination of MRF glass above the levels permitted under the existing end of waste code for glass, requiring MRFs to invest in washing equipment or charge a higher gate fee for beneficiation.
- Reduction in variability of materials in household products. Over time as the 10Rs and circular economy approach drives the rejection of materials used in products that cannot be reused or recycled, a simpler stream of products may develop. This in turn may support larger volumes of material for single stream reprocessing opportunities or less mixed waste processed in the MRF stream. This is likely to be a long-term outcome.
- There is a significant amount of investment required to establish the enabling infrastructure for a precinct, and for the establishment of new industry to lease land and contribute to the precinct objectives. If this precinct is not available at the time of construction, then implementation of these solutions could be delayed, or alternative sites may be required.

6 Managing Residual Waste in the Wide Bay Burnett region

Residual waste refers to the material left over and managed in, or out of region, after all other technologically, economically, and environmentally practicable alternatives are exhausted. This typically includes material captured in the household kerbside recycling bins, but also unsorted mixed loads delivered to transfer stations, and portions of commercial waste. This chapter considers actions for the region to take to support the identification of an acceptable long-term solution for residual waste. Each of these are discussed in turn:

i) An overview of residual waste stream dynamics

ii) Discussion over key levers including potential costs and benefits.

iii) Options considered.

iv) Recommendations and agreed actions to move towards a 2032 outcome.

v) Expected outcomes.

vi) Consideration of what may change in execution.

6.1 Residual waste stream dynamics

In FY20-21, approximately 221,000 tonnes of residual waste was managed, of which 123,000 tonnes was generated directly by households. By FY30-31, with greater organics diversion and improvements in capture from the kerbside streams, the amount of residual waste is expected to be 224,000 tonnes (allowing for growth) across the MSW, C&I and C&D streams, growing to 235,000 tonnes by FY40-41 and 250,000 tonnes by FY50-51. For the household MSW stream only, Councils are forecast to need to manage 90,000 tonnes of residual waste in FY30-31, 91,000 tonnes in FY40-41 and 94,000 tonnes by FY50-51. The forecast residual waste arisings including interventions are presented in **Figure 15**

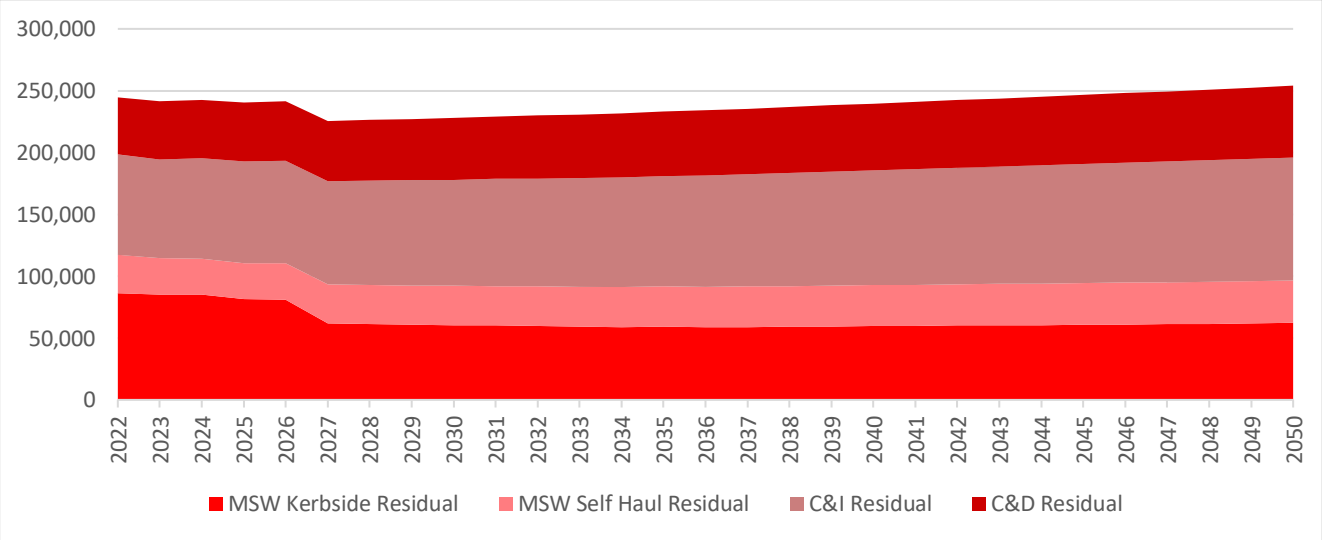


Figure 15 Current forecast – residual waste within the region to 2050 (tonnes per stream)

Each Council manages its own landfill capacity, including both current and historic landfill. Landfill capacity at a regional scale is not constrained, with the two largest facilities at Bundaberg and Maryborough having significant remaining airspace. However, concerns over regional capacity at other centres have been identified as follows:

- Gympie Regional Council has an immediate need to secure or construct additional landfill capacity to service the Gympie population with current solutions costly and short term in nature.
- South Burnett Regional Council's Kingaroy Waste Facility is forecast to be full by 2029.

Whilst actions taken under the organics and recycling streams will reduce the amount of residual waste going to landfill across the region, it is expected that there will continue to be a long-term need for approved and constructed landfill to 2050 and beyond.

The Queensland Waste Management and Resource Recovery Strategy and supporting action plan *Queensland's Energy from Waste Policy* both clearly present a role for energy recovery within waste management. In the Wide Bay Burnett region, there are no commercial scale energy from waste facilities that can process mixed household or commercial residual waste. There are also none planned. Outside of the region there are plans to establish Energy from Waste facilities in the Southeast Queensland region but there are no large-scale approved combustion projects, meaning it could take several years for a plant to be approved, constructed, and commissioned.

6.2 Levers and interventions

6.2.1 Avoidance and residual waste reduction

Education programs associated with reducing food waste, diversion of food and garden organics and improving returns in the kerbside recycling bin and providing more choice or separation opportunities for away from home recycling there is expected to be a knock-on effect on the residual waste bin.

6.2.2 Landfill levy and bans

The landfill levy rate is scheduled to increase with the prevailing rate of inflation over the forward estimated period. For residual waste, the levy rate is paid on all waste disposed of to landfill. As previously detailed within the region all Gympie Regional Council, North Burnett Regional Council and South Burnett Regional Council will receive 100% of the levy paid on household waste that goes to landfill as an advanced payment. The landfill levy liability, the difference between levy paid and annual advanced payment, will continue to reduce to 20% by FY30-31 increasing the operating cost of this service for Bundaberg Regional Council and Fraser Coast Regional Council, which is likely to need to be passed onto ratepayers. It is noted there is a commitment from the Queensland Government to review the annual advanced payment arrangements by 2025.

The introduction of landfill bans for additional materials will further support diversion from landfill and reduce the amount of residual waste generated. This work has not yet been completed by the Queensland Government, and implementation is likely to focus on materials that either pose an unacceptable risk when placed in landfill or where economically feasible recycling exists for a product.

6.2.3 Infrastructure – landfill capacity and new landfill

Landfill capacity is severely constrained for Gympie Regional Council and in the medium term for South-Burnett Regional Council, but generally not constrained within the broader region in the short-medium term. In the longer term if long-term landfill was the preferred solution, then additional capacity may need to be added as current approved and engineered cells are used up. The true cost of adding additional landfill capacity extends beyond solely traditional capital and operational expenditure, but into provisions for capping and closure, and long-term geotechnical and environmental monitoring for 20-25 years beyond exhausted airspace capacity. Where extension is not possible, the approvals process and cost of identifying a new site for a large-scale landfill can be significant.

Landfills are often cited as a major landfill gas emitter, however actions in the region removing a portion of the putrescible component may reduce these emissions. The traditional view is that energy recovery of material that otherwise would go to landfill would be environmentally beneficial however evidence from Scotland has cited the reducing emissions benefit of incineration (with energy recovery) technology that is processing a higher proportion of fossil fuel derived non-recyclable wastes (e.g., plastics)[55], particularly with the expected growth of alternative renewable energy sources in Queensland. It is noted however that Scotland has several operational EfW facilities and planning approvals in place for several further facilities, compared to the region which has none. The carbon benefits would need to be explored further in a life cycle assessment as part of a future business case.

6.2.4 Infrastructure – Energy recovery

The Queensland Waste Management and Resource Recovery Strategy places an emphasis on the waste hierarchy with energy recovery placed higher than landfill. **Table 23** presents summary information on potential energy recovery technology that could be deployed in the region.

Table 23 EfW technologies and options

Description	Combustion	Pyrolysis	Gasification	Processed Engineered Fuel as fuel substitute
Indicative capacity	50ktpa to 200ktpa plus	Range from 10ktpa to 70ktpa	Approx 50-100ktpa	Range from 50ktpa to 250ktpa
Process	Moving grate combustion technology with energy recovery	Thermal breakdown of waste in the absence of air.	Thermal breakdown & partial oxidation of waste under controlled oxygen environment	Development of fuel from waste
Suitable feedstock	Mixed residual waste with limits on certain materials	Single source feedstock or PEF/RDF derived from MSW/C&I mixed waste that is homogenised and uniformly sized.	Requires pre-processing system to extract unsuitable materials (glass, inorganics, metals etc.,). Can target specific feedstocks at smaller scale. Some technologies use mixed waste feedstock.	Post-processed mixed waste targeting non-recyclable plastics, cardboard, paper, textiles, and waste timber.
Capital cost	$300M-$500M	$9M-$119M	$150M-$200M	$40M

[55] Scottish Government, 2022. Stop, Sort, Burn, Bury – incineration in the waste hierarchy: independent review, from https://www.gov.scot/publications/stop-sort-burn-bury-independent-review-role-incineration-waste-hierarchy-scotland/documents/

Description	Combustion	Pyrolysis	Gasification	Processed Engineered Fuel as fuel substitute
Indicative gate fees	$140-$350 per tonne	$180-$300 per tonne	$180-$300 per tonne	$100-$200 per tonne
Output product	Electricity, heat, steam, metals	Biochar	Syngas converted to electricity	Engineered fuel
By products	Flue gas residues Incinerator bottom ash Fly ash	Bio-oil and syngas	Biochar / slag material Flu gas residues	Pre-processing wastes (i.e., rejected material)
Environmental concerns or benefits	Would need to operate under EfW Policy and environmental limits Relatively large footprint Would require EIS	Pyrolysis is not harmful to the environment when it is done properly. Some reasons for pollution from pyrolysis include incomplete pyrolysis, no gas recycling, oxygen entry, improper feedstock, dangerous disposal of products and inappropriate storage and transport.	Limited emission as closed system. Emissions managed under EfW policy and environmental limits.	Greater proportion of residual waste goes to landfill. Can require long-distance transport Can offset use of fossil fuels (e.g., if burnt in cement kiln)
Community concerns or benefits	Untested in North Queensland. Would require long community interaction and strong social license.	Tyre pyrolysis has a poor compliance record with planning and EPA requirements in Victoria. In Queensland, a pyrolysis plant, treating tyres and plastics, is in the process of obtaining approval.	Typically deployed in smaller scale Plants. Larger Plants may have similar challenges to combustion	Generates a fuel product. Fuel may be utilised out of region
Technology certainty	Proven technology at large scale: smaller scale also proven internationally. By-products 20-25% of feedstock and require approved pathway for reuse.	Limited maturity. Largely unproven on mixed wastes such as un-treated residual MSW. There are no pyrolysis facilities or proposals for mixed waste in Australia.	Technology still developing, particularly at large scale. Some high profiles with facilities in Europe. Unproven on required scale in Australia. Small scale deployment for specific wastes viable or can be deployed on mixed feedstock	Existing technology deployed in Australia servicing local and international markets. It is understood that Cement Australia has approved the use of PEF in the Gladstone Cement Kiln.

Note: Accurate costings would form part of detailed business case

Capital costs exclude site preparation, output product quality depends on quality of input. Detail based on benchmarking.

Whilst there is a clear acceptance of the role of energy from waste within Queensland, its deployment has been hindered to date by a lack of need (e.g., levy or other fiscal drivers, general availability of landfill airspace), or by a lack of community support. Key questions to be answered in the region in relation to EfW would be:

- Timeframes when an EfW facility is required to come online and expected benefits (compared to the modified current state) compared to landfilling. A life cycle analysis should be undertaken as part of business case development.

- The approach to be taken to engage with the community and broader stakeholder groups to develop a proposal that allows engages prior to key decisions being made and supports the community.
- The type of technology to be deployed.
- A solution for incinerator bottom ash allowing its safe and environmentally sound reuse and recycling, ideally within the region, would help support the development of future business cases. This will require liaison with the Queensland Government to facilitate through existing policy and legislation.
- The ownership and contracting approach for development of a facility. Typically, there would be some private sector interest in providing investment, alongside opportunities for co-ownership or even for Councils to own themselves, although this is likely undesirable.
- The cost and affordability of a long-term energy from waste facility warrants further scrutiny. Whilst there is a need to secure a long-term solution for how residual waste is managed, Councils will need to decide based on best value for their ratepayers.

Individually procured or delivered larger scale traditional EfW may be beyond even the largest Council within the region based on a current technology assessment. Smaller scale portable EfW is already deployed for processing of some specific wastes, such as tyres, however technology is still emerging, and cost-effectiveness and reliability may not be attractive at scale and by-products (e.g., biochar) remain challenging for reuse. Over the next several years this is expected to change, as technologies are proven to be operable and profitable for technology providers, which may present an alternative to conventional residual waste solutions.

6.3 Options considered

Major options considered for how residual waste is managed in the region are:

Table 24 Major residual waste decisions

Decision area	Business as usual	Options			Rationale
Short term residual capacity considerations	No action on existing capacity	No need for action	Individual council action	Immediate regional solution	In the immediate term Councils continue to manage their own landfill airspace. GRC has an immediate need.
Long term residual waste solution needed	Existing landfills manage residual waste	Do nothing	Individual council action	Develop long-term regional solution	Councils to work through individual solutions
Residual waste solution	Landfill	Extend existing landfills	Close smaller landfills and move to regional landfill	Develop energy from waste solution as a region	Councils to work together consider long-term regional landfill feasibility
Develop EfW solution in region	No current EfW	No action	Develop individual EfW solutions for Councils	Develop regional EfW solution	Councils decided there was no desire to have an EfW facility within the region.
Send residual waste to EfW	No waste sent to EfW	Do nothing	Send to regional EfW facility	Send out of region to EfW or PEF facility	Councils were of the view that some residual waste may be sent out of region to EfW facilities, or a PEF facility, once constructed (likely in SEQ) and operational.
Other problem wastes: timber, contaminated soil, PFAS etc.	Manage via existing arrangements (e.g., landfill)	Do nothing (BAU)	Develop individual council solutions	Develop regional solution to problem wastes	Regional collaboration to identify alternative management solutions or safe disposal options for range of problematic wastes or emerging contaminants within the region
Regional management plan for disaster wastes	Manage under existing arrangements	Do nothing (BAU	Councils develop individual solutions	Collaboration at regional scale to manage disaster wastes	No change in existing disaster waste management procedures

Cells in RED reflect decisions; BRC-Bundaberg Regional Council, Cherbourg Aboriginal Shire Council, FCRC-Fraser Coast Regional Council, GRC-Gympie Regional Council, NBRC-North Burnett Regional Council, SBRC-South Burnett Regional Council; ALL: Indicates collaborative activities for all councils to participate in.

6.3.1 Short term residual capacity considerations

In the short to medium term Councils will continue to manage their own landfill airspace. Where a Council exhausts its landfill airspace before an alternative solution, whether at their own facility or at a regional scale, is available, it may seek to transport residual waste to another facility out of LGA. This is an immediate action for Gympie Regional Council who are expected to run out of landfill capacity shortly. Others will run out of capacity in the short-medium term and may need to seek similar alternative arrangements.

6.3.2 Deciding on a long-term residual waste solution

At a regional scale there may be a need to develop a collaborative long-term approach to residual waste management which could involve development of a long-term regional landfill facility. The decision is whether to send most residual waste to landfill over the medium and long-term, or to utilise EfW. Through development of the Plan, it was decided that Council led EfW facilities at large scale are unlikely to be developed in the region, however an alternative solution could be to utilise facilities out of region.

As there are currently no commercial scale EfW facilities in development that can receive and process mixed MSW or C&I wastes, there is uncertainty over this option. Until such a facility is commissioned and contracted, Councils will need to continue to send their residual waste to landfill. Even if Councils decide to send waste out of region, long-term landfill capacity will need to be maintained in the region to manage lower volumes of residual waste.

Decisions to send waste out of region to EfW will be driven by commercial decisions associated with the differential between local disposal and gate fee plus transport cost for the receiving facility. It is also feasible that in the long-term smaller scale EfW technologies may emerge at a commercial scale locally that can provide a similar service for Council. In delivering this Plan Councils may need to allow for the cost of developing their own business cases to send waste to future EfW facilities, whether in or out of region.

Councils also receive a significant portion of predominantly C&I waste that is disposed of to landfill. This material may also be targeted by EfW facility operators outside of the region. The diversion from Council facilities may drive a further reduction in residual waste managed by Councils pending commercial decisions by those collecting the C&I waste in the region.

6.3.3 Managing disaster waste

A long-term management approach to disaster waste within the region was identified as a collaborative opportunity for the region, however it was decided that there already sufficient processes in place to manage this, so no further action was identified.

6.3.4 Managing problem wastes

Additional to biosolids already identified, the region manages several other problematic residual wastes. This includes timber, contaminated soils, asbestos and material containing emerging contaminants. Councils will collaborate at a regional scale to develop solutions for these wastes and identify appropriate management fates.

6.4 Expected outcomes

Decisions supporting how residual waste is managed within the region could have a direct impact on households. The quantity and quality of residual waste is dependent on the avoidance and diversion activities undertaken in the region. Solutions and actions are not just around additional resource recovery, but also ensuring that there is sufficient residual treatment and disposal capacity in the region in the long-term to meet the needs of a growing population. Residual waste will continue to be sent to landfill.

6.4.1 Residual waste management - landfill

With landfill as the preferred solution for at least the next 10-years, capacity will need to be able to manage as a minimum 89,700 tonnes of residual MSW per year in FY30-31, 90,700 tonnes in FY40-41 and 95,000 tonnes by FY50-51, however across the region Councils also manage significant volumes of the C&I and C&D streams. Based on current proportions and a long-term forecast, Councils in the region will still need to manage 224,700 tonnes of residual waste per year by FY30-31 and potentially 250,000 tonnes by FY50-51. Additional capacity can be progressively added over time. If all residual waste continues to go to landfill, the resulting recovery rate in FY30-31 will be 59% with little change through to FY50-51. This recovery rate assumes improvements to organics recovery and material recovery as described in prior sections. **Figure 16** shows the forecast residual waste arisings under the landfill scenario (compared to the do nothing current residual scenario).

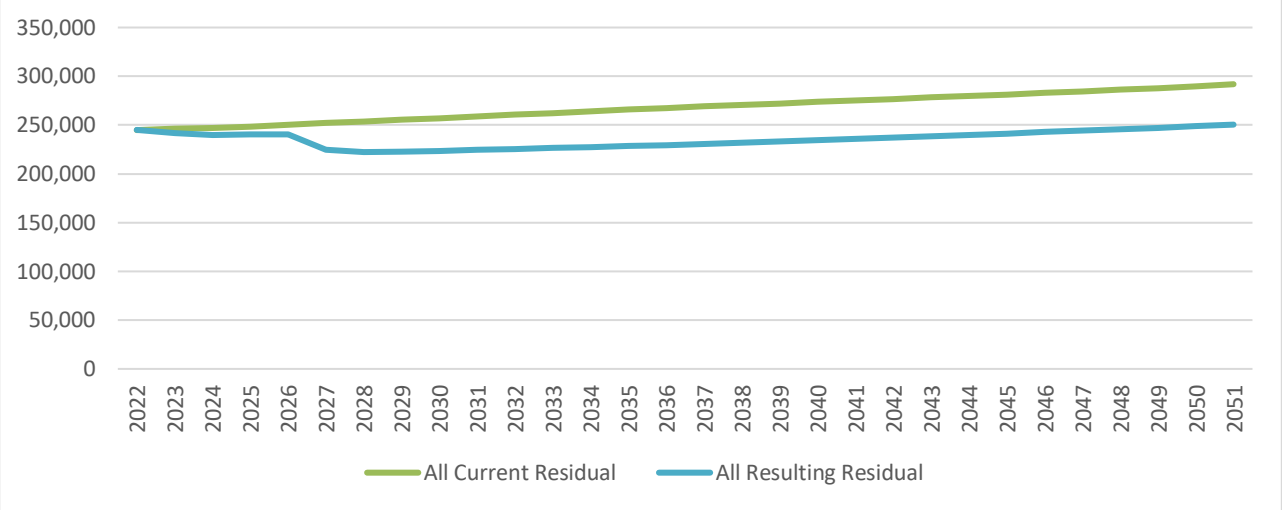


Figure 16 Forecast whole of region residual waste arisings (landfill scenario)

6.4.2 Sending waste out of region to future EfW facility

Under the assumption that an EfW facility will be established out of region that is commercially viable for Councils to utilise, by FY35-36, it is expected that a combination of MSW and C&I streams will be captured. If such a facility was available in proximity to the region it may target mixed C&D loads currently managed by Councils. Additionally, not all residual waste will be suitable for EfW such as asbestos and soils. The deployment of an EfW solution capturing residual waste from the region could significantly increase the regions resource recovery rate to an estimated 70% to 80%. There is uncertainty over how much residual waste would be sent under this scenario, however this is likely, under current policy and technology settings, the only pathway to the region getting close to the Queensland Government's resource recovery rate target of 90% by 2050. The impact on the MSW stream inclusive of kerbside and self-hauled waste is show on **Figure 17**.

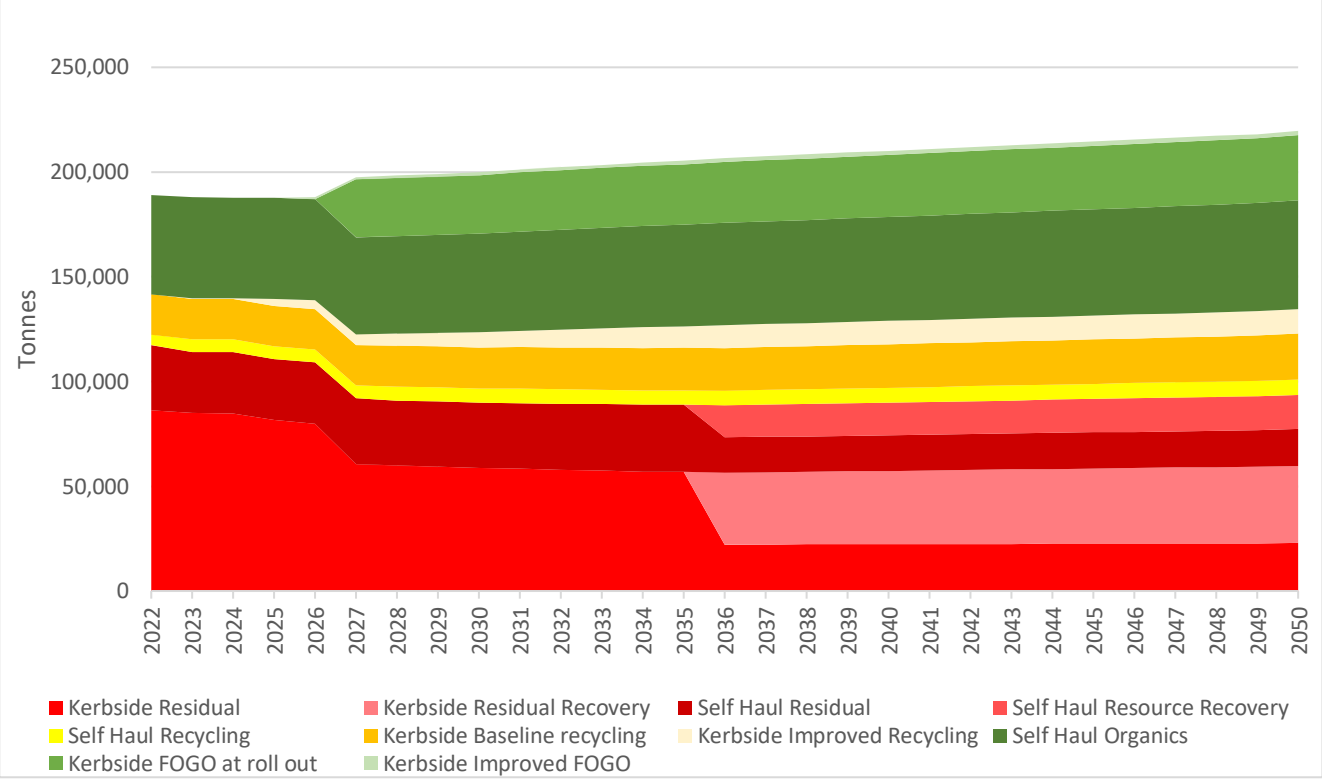


Figure 17 Forecast changes to MSW stream with energy recovery (out of region)

There is a high degree of uncertainty over the councils sending waste to EfW at this stage of Plan development, notably as facilities do not exist. Whilst it is likely they will be available in the future, it is unlikely this will be within the next 10-years, and so there is time for Councils to adapt to new facilities and technologies becoming commercially available. For all councils there would be little incentive to send waste to EfW unless commercially comparable to their own landfill costs. Even if EfW was utilised, it is estimated that Councils would still need to manage 40,000 tonnes of residual waste from the MSW stream per year from FY35-36. **Figure 18** shows that an estimated 125,000 tonnes of residual waste may still need to be managed in landfill, even if 80% of residual MSW and C&I waste from Bundaberg and Fraser Coast LGAs was sent to an EfW facility in FY35-36.

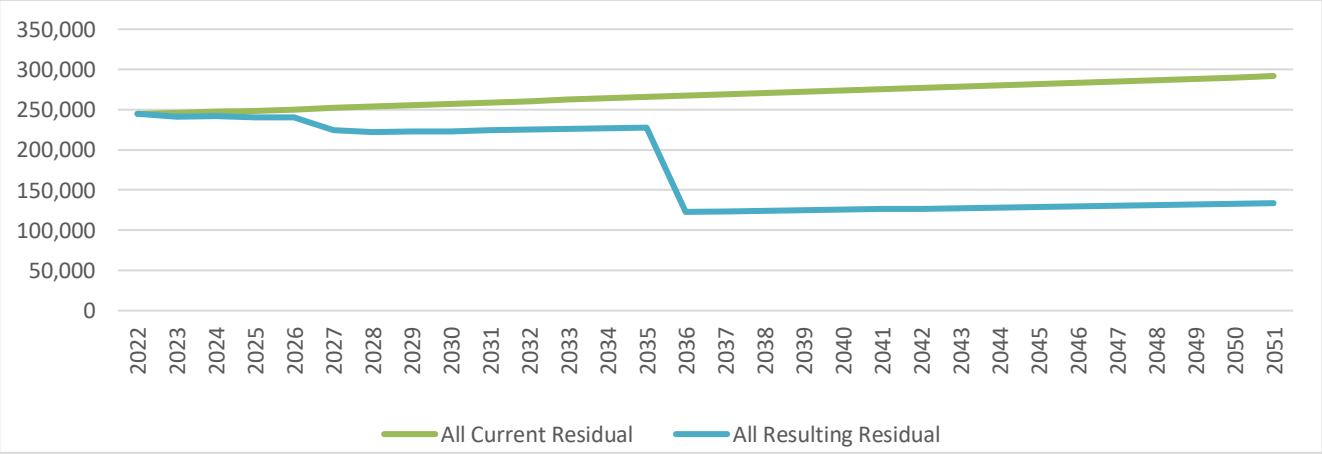


Figure 18 Impact on residual waste volumes if EfW is utilised

6.5 The cost of making the transition

For residual waste the solutions tested under economic analysis included sending residual waste via road to a hypothetical EfW facility utilising combustion technology on the northside of the Greater Brisbane Area. There is a general expectation that under current policy settings, the utilisation of EfW is more expensive than sending the same waste to landfill, even accounting for the cost of adding additional landfill airspace. The costs of implementing EfW were considered in the context of decisions made in relation to streams discussed in Section 4 and Section 5.

Costs included in the analysis include:

- Capital, operating and lifecycle costs – focussed predominantly on operating costs associated with paying a gate fee and any primary processing (e.g., bulking) associated with preparing waste for transport to an out-of-region EfW facility.
- Transport costs, including transport of bulked waste to hypothetical EfW facility in Brisbane.

Managing residual waste will cost more than the pre-FY22-23 levy settings for Bundaberg Regional Council and Fraser Coast Regional Council, regardless of preferred solution. For other leviable councils, it is assumed that costs will still be considered as business as usual, including the establishment of new landfill capacity. The following costs are identified depending on the solutions chosen:

- **Residual waste to landfill:** Under the current proposed levy settings, by FY30-31 the increased levy liability after improvements in organics diversion and recycling capture are expected to be **$2.7 million per year** for Bundaberg Regional Council and **$3.0 million per year** (in real terms) for Fraser Coast Regional Council if all resulting residual waste continues to be sent to Landfill. This amounts to an additional cost per household of $66-68 to account for the increased cost in landfill disposal allowing for a reduction in waste to landfill because of actions and interventions in this Plan. For the other levy paying councils in region the costs for sending waste to landfill are not forecast to increase above business-as-usual. Business as usual costs for new cell development, and for closing and rehabilitating former landfill may still be significant and require funding support.
- **Sending residual waste to an out-of-region combustion facility:** If a proportion of residual waste was sent to an energy from waste facility out of region, the indicative whole-of-life costs in modelled period for doing so are estimated to be **$92 million** (real cost, based on 2023 values) over the period FY35-36 to FY50-51. Councils would be a price taker, and largely these costs would be operational covering gate fee plus transport.[56] It is estimated that this might add an additional $130 per household per year considering the levy benefit of not sending this waste to landfill. The economic analysis assumes such a facility would not be operational until at FY35-36. There is a high-degree of uncertainty in the cost per household per year which depends on the procurement approach, and, assuming a private-sector owned facility, the expected gate fee. Consideration of saved landfill airspace also significantly affects the overall cost. All of these will require detailed consideration as the as a potential solution becomes available.

[56] Note the CBA covers the 30-year period of the Plan however an EfW solution is not expected to be operational until halfway through this period (assumed in FY35-36), and as such costs are not necessarily indicative of full solution costs. Cost per household per year above sending the same waste to landfill may be more beneficial.

6.6 Timeframes for delivery

The timeframes for delivery of the residual waste component of the plan require the development or continuation of work to identify the feasibility and required timings for a solution to be in place. Long-term residual solutions are not required immediately, but the establishment of new landfill capacity or EfW could take several years to progress from inception to commissioning. **Table 25** summarises proposed timeframes for managing the residual waste stream.

Table 25 Residual Waste Stream implementation timeframes

Immediate action (within next 2 years)	Within next 5 years	Within next 10 years
ALL: Ongoing management of own councils landfill requirements	ALL: Ongoing management of own councils landfill requirements	ALL: Ongoing management of own councils landfill requirements
	ALL: Collaborate on the development of long-term approaches to managing problematic and emerging wastes, including contaminated soils, asbestos, PFAS containing materials and biosolids.	
	ALL: Develop long-term solution for regional infrastructure including either a regional landfill or sending waste out of region for energy recovery, progressing from feasibility study to business case.	ALL: Construct and commission long-term infrastructure solution including provision of bulking facilities where out of LGA residual waste transport is required.

Cells in GREY indicate action not expected to commence during the timeframe.

6.7 Supporting the change

There is a clear choice to be made between the most economically beneficial approach to residual waste management in the region, whether acceptance of long-term landfill or the development of a long-term energy from waste solution. The latter will still require long-term landfill airspace, however significantly less. To support the definition of the future state for residual waste:

- **Long term strategic planning requires support:** A long-term residual waste strategy for the Wide Bay Burnett region should be developed in collaboration. This could be expanded to incorporate neighbouring Councils or regions to identify potential scale and transport costs. This strategy should identify and work in partnership with industry to identify feasible solutions but also expected costs versus the need to ensure residual landfill capacity is available beyond currently approved capacities.
- **Levy clarity supports planning beyond the next 10-years:** long term certainty of the waste levy rate and annual advanced payment is required. For residual waste that goes to landfill, where there are no other options, there is little benefit of applying a waste disposal levy other than to raise revenue as further diversion has been proven to be unachievable without an unreasonable cost burden on households and industry.

7 Implementing the Plan

The previous sections have identified current issues and opportunities and developed a series of preferred actions and approaches for how waste and resource recovery is managed in the Wide Bay Burnett Region.

7.1 Key actions & collaborations

This Plan has been developed to identify areas for Councils within the WBB region to collaborate on in the delivery of waste services, as well as to identify and accept individual Council actions and decisions. To support development of this Plan, the region has utilised a collaborative approach to strategy development and implementation by establishing a specific working group. Due to the varied economic and geographical conditions in the region agreement has been reached on the actions for regional collaboration and for individual council action.

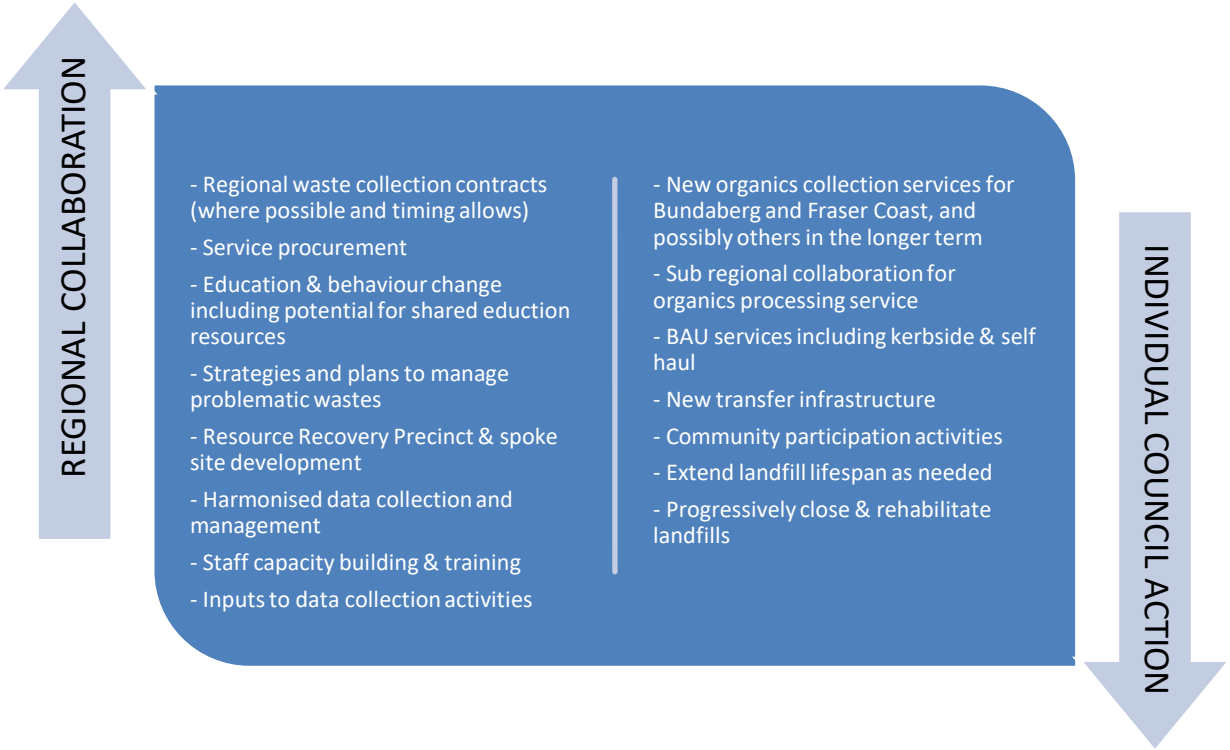


Figure 19 Regional Collaboration & Individual Council Actions

7.2 Delivery mechanism

The Plan will be delivered by the region via the establishment of a Resource Recovery Working Group which will be formalised by member councils. The structure of a steering group and working group and its functionality has been endorsed by member councils. **Figure 23** provides a schematic of the proposed governance structure and function.

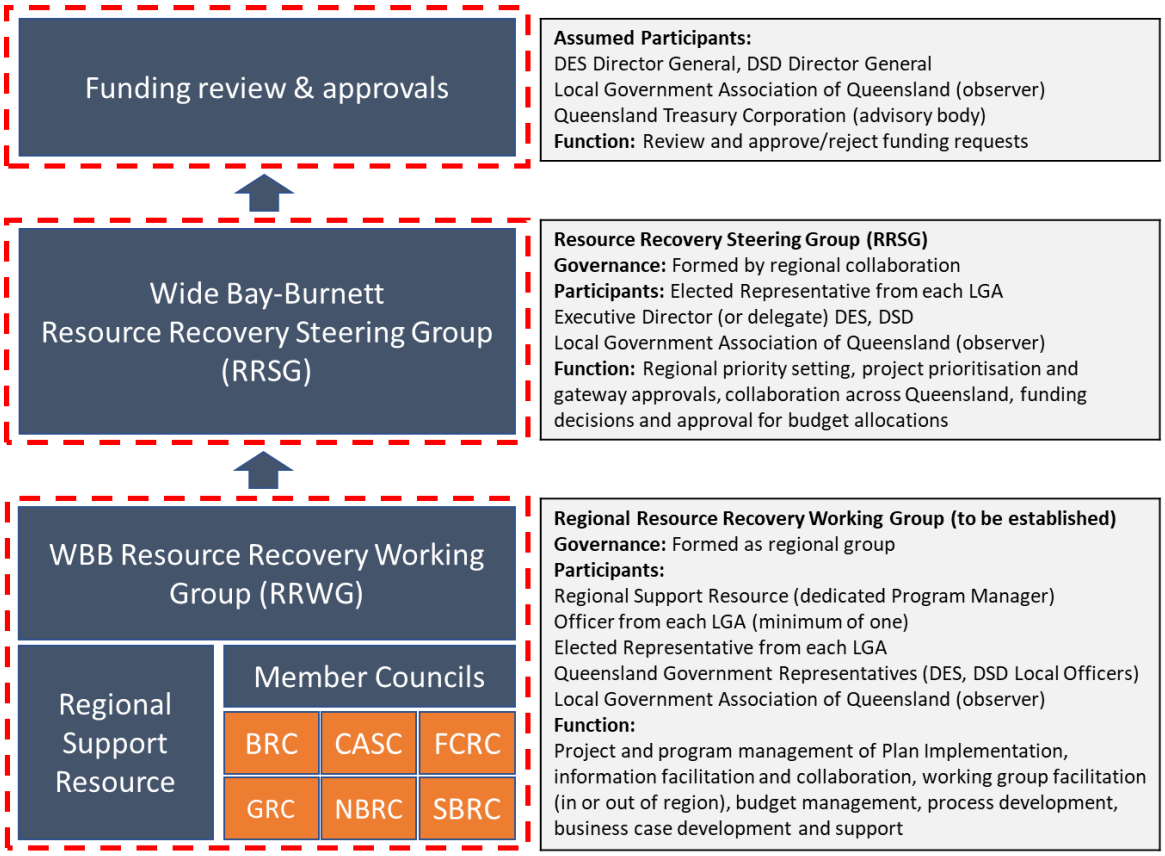


Figure 20 Governance and collaboration structure for implementation

7.2.1 Regional Working Group

Strategic ownership of this Plan and the underlying actions sit with the member councils. A Waste and Resource Recovery Working Group will be formalised to deliver the Plan. This will need to be established as the first action in implementing the Plan, including establishing terms of reference, participation expectations and implementation goals. This group will have responsibility to steer the outcomes of the region in resource recovery and recycling, including the following activities:

- Ownership, monitoring, and review of the WBB Regional Waste and Resource Recovery Plan
- Support identification and priorities (as per the RWRRP) as they require decisions for funding from the Queensland Government decision making body
- Access support via a regional resource or centralised function for administration, funding, and development of supporting documentation and access to shared information.
- Collaboration on:
    - Education and behavioural change, including a regional Strategy
    - Data harmonisation, management, and reporting
    - Capacity building and education for resource recovery staff
    - Establishment of circular economy community initiatives such as repair cafes or hubs, community composting, tool libraries

- Development of feasibility studies, business cases and other research activities relating to progressing regional solutions that benefit Councils in the long-term

The Queensland Government would be required to facilitate a coordinator for the established group to manage collaboration, progress against the plan and generally be a champion for collaborative actions across the region. One full-time equivalent resource will be included as part of Plan Implementation to coordinate the regional plan response and act as secretariat to the group.

Whilst detail will be developed as part of the terms of reference. Implementation of the Plan including an allowance for Council Officer time (above existing commitments), and a project or program manager is likely to be approximately **$0.3 million per year**. The majority of this is for new staff requirements to implement the Plan.

7.2.2 Regional Procurement

Where the working group progress actions that will require the contracting (of more than one Council) of a service provider consideration of setting up a separate regional procurement entity would be advantageous. It is noted that the current model by Councils (with one Council leading procurement but each Council signing an individual contract) may continue to be the preferred approach. The actions that potentially would require either approach are:

- Procurement of technical or commercial advisory services relating to research and development
- Regional scale contracts for waste audit, surveys, software
- Development of a new contract(s) for kerbside recycling collections and processing
- Development of a long-term regional residual waste solution(s) or other problem wastes

For some elements of regional scale procurement at a regional scale (notably long-term contracts for collection or post-collections services) it is expected that the entity would need to have authorisation from the Australian Consumer and Competition Commission (ACCC) to collectively procure.

7.2.3 Support for delivery

To support the execution of the regional plan, and the development of detailed business cases, procurement and contract development activities support will be required. It is understood that this function will be developed and funded by the Queensland Government, for which details are currently being finalised. This function will support:

- Governance and management system development for implementation of projects
- Project Management and scheduling associated with development of key initiatives.
- Non-technical support to development of business cases and funding plans for key initiatives
- Support with preparation of information to support funding applications specific to the gateway processes setup by the Queensland or Commonwealth Government
- Support the coordination of the monitoring, evaluation and reporting requirements arising from the implementation of the plan

7.3 Implementation Plan

An implementation schematic, bringing together the details of this Plan and timeframes for implementation has been developed as presented in **Table 26**.

While the regional waste management plan provides the primary vehicle for accessing available funding from the Recycling and Jobs Fund, there may also be opportunities for initiatives to be funded that are outside the plan. For example, a pilot at a local level to 'test' the suitability of a model or infrastructure for the region (or sub-region). It is recognised that the plan needs to be a living document and that not all potential initiatives will have been identified in the plan.

However, it is expected that the bulk of the funding will come through the projects identified in the plan with a more streamlined pathway for funding approvals as it has already been identified in the plan. In the first instance any projects identified that are outside the plan would likely be discussed with the regional working and steering groups and the proposed regional support resource position that will be funded to support implementation of the plan, to assess suitability for funding under the plan or whether this would be considered under a separate funding process.

Councils, in participating in the development of this plan and subsequent endorsement of or support for its finalisation and publication, can do so in the knowledge that this consideration does not obligate individual Councils to any funding commitment. Subsequent business cases developed as part of implementing the plan and implementation decisions made by the region for implementing the plan would normally include that detail.

Cherbourg Aboriginal Shire Council is a member of the Wide Bay Burnett region for the purpose of developing and implementing this Plan. Cherbourg Aboriginal Shire Council has been consulted during the development of this Plan and agreement reached for the first stage to refine its own local waste reduction and resource recovery plan which would then be acknowledged in the implementation of the Wide Bay Burnett Regional Waste and Resource Recovery Plan. This Plan should be read and interpreted with this inclusion in mind.

Table 26 Implementation Schematic

Action	Responsibility	Immediate	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2040	2050
		Next 2 years			Within next 5 years			Within next 10 years					To 2040	To 2050
General														
Establish regional waste working group to implement Plan	All													
Program management	WRRSG/WRRWG													
Regional collaboration (e.g., Working group meetings, action management, etc.)	WRRSG/WRRWG/All													
Focus on local employment where opportunities present	WRRSG/WRRWG													
Provide capacity building on issues / matters as identified by member councils and engage experts to assist as required	WRRSG/WRRWG													
Advocate for Transport subsidies consideration	WRRSG/WRRWG													
Focus on local employment where opportunities present	WRRSG/WRRWG													
Organic Waste Management														
Participate in Education and Behaviour Change Initiative (assumed continuation) as part of regional education strategy – incorporating a food waste avoidance component	WRRWG, All													
Review potential for behaviour change regulation (new services)	BRC, FCRC													
Roll out of at-home composting solutions	QGOV													
Develop business case for organics collection service for council approval including refinement of market price for recycled organics	BRC, FCRC													
Commence new organic waste collection service education	BRC, FCRC													
Procurement of organic waste collection solution	BRC, FCRC													
Procurement of organic waste processing solution	BRC, FCRC													
Commence and operate kerbside organic waste collection service (pending individual council approval)	BRC, FCRC													
Continuation of self-haul green waste receipt and processing	All													
Roll out of community composting solutions including guidance	QGOV													
Collaborate on regional solution for finding highest value market for green waste across region	WRRWG													
Develop regional solution for biosolids and timber	WRRWG													
Develop pathway to improve non-Council held data collection	QGOV, All													
Material Recycling & Recovery														
Participate in Education and Behaviour Change Initiative (assumed continuation) and develop regional education strategy, implement	WRRSG/WRRWG, All													
Review & agree pathway for improved enforcement activity for poor household behaviours in kerbside bin service provision, and implement	WRRWG, All													
Seek opportunities to collaborate on regional collections approach when contracts allow	WRRWG, All													
Develop business case for funding of glass processing and washing solution	FCRC													
Procure, construct and commission glass processing and washing solution	FCRC													
Develop business case, designs for new or improved transfer facilities	All (as required)													
Construct and commission upgrades or new transfer facilities	All (as required)													
Collaborate on establishment of regional scale precinct and ancillary satellite sites in accordance with precinct guidelines	WRRWG, All													
Construct enabling infrastructure for precinct	QGOV													
Establish new resource recovery processing facilities within precinct	QGOV, All support													

Action	Responsibility	Immediate	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2040	2050
		Next 2 years			Within next 5 years			Within next 10 years					To 2040	To 2050
Work with Queensland Government agencies to improve uptake or recycled materials in procurement	QGOV, WRRWG													
Develop pathway to improve material flow data and knowledge across region for recyclable material	QGOV, WRRWG													
Collaborate to collect data on contamination within kerbside bins to improve education approach.	RWWG, WRRWG													
Residual Waste Management														
Councils to consider individual landfill capacity needs in short-medium and long-term	WRRWG, All													
Assist councils to develop new landfill opportunities including regional or sub-regional facilities.	WRRSG, WRRWG, All													
Consider long-term options and approach to managing residual waste in the long-term, pending availability of facilities out of region	WRRWG, All													
Feasibility and detailed business cases to support involvement in future EfW projects in or ex-region as opportunities emerge.	WRRSG, WRRWG, All													
Develop long-term approach to managing problem and emerging wastes	WRRWG, All													

Notes: BRC-Bundaberg Regional Council, CASC-Cherbourg Aboriginal Shire Council, FCRC-Fraser Coast Regional Council, GRC-Gympie Regional Council, NBRC-North Burnett Regional Council, SBRC-South Burnett Regional Council; ALL: Indicates collaborative activities for all councils to participate in. WRRSG- Waste and Resource Recovery Steering Group. WRRWG-Waste and Resource Recovery Working Group (including Regional Support Resource), QGOV-Queensland Government and Agencies

7.4 Roles and responsibilities

It is assumed that the region will establish a resource recovery working group who will overall ownership of the Plan. Roles and responsibilities for implementation of the Plan sit with individual councils collaborating under the RWWG. A RACI (responsible, accountable, consulted, informed) matrix has been developed to describe the participation of various stakeholders in delivering the regional plan. It is expected that this matrix is updated as implementation of the Plan progresses by the RWWG.

The definitions adopted for the RACI matrix are in **Table 27**, with the matrix presented in **Table 28**.

Table 27 RACI definitions

Item	Definition	Abbreviation
Responsible	Entity responsible for completing the work associated with the action/task, may be split across multiple entities	R
Accountable	Entity responsible for signing off/approving the outcome of the task. May reside with Councils to sign off, or with funding entities or gateway approvals to sign off.	A
Consulted	Provides input into the delivery of the task/action based on their specialist knowledge or experience.	C
Informed	Important to keep stakeholders engaged/informed as an activity progresses or decisions are made.	I
Where required	Identifies where RACI action will sit if the activity is required. This may denote an activity where Council in the future decides to progress a particular option.	*
Not required	Specific to decisions made in this Plan, to complete the RACI, not required is applied to stakeholders who do not have role in addressing specific tasks or actions.	NR

Table 28 RACI Chart – Plan Implementation

Action	RACI										
	QGOV (DES)	QGOV (DSD)	Project & Funding Support Function	RRWG	Bundaberg Regional Council	Cherbourg Aboriginal Shire Council	Fraser Coast Regional Council	Gympie Regional Council	North Burnett Regional Council	South Burnett Regional Council	Industry
General Actions											
Establish regional waste working group to implement Plan	C	C	I	NR	A	A	A	A	A	A	I
Program management	C	C	I	A	R	R	R	R	R	R	NR
Regional collaboration (e.g., RRWG meetings, action management, etc.)	C	C	I	R	A	A	A	A	A	A	C
Liaison with State Agencies, PMO, industry	C	C	I	A	R	R	R	R	R	R	C
Organic Waste Management											
Participate in Education and Behaviour Change Initiative (assumed continuation) as part of regional education strategy – incorporating a food waste avoidance component	A	I	NR	R	R	R*	R	R	R	NR	A
Review potential for behaviour change regulation (new services)	C	I	NR	I	A/R	I	A/R	I	I	I	C
Roll out of at-home composting solutions	A/R	I	I	C	I	I	I	I	I	I	I
Develop business case for organics collection service for council approval including refinement of market price for recycled organics	C	C	C	I	A/R	I	**A/R**	I	**I**	I	C
Commence new organic waste collection service education	I	I	I	I	A/R	I	A/R	I	**I**	I	I
Procurement of organic waste collection solution	I	I	C	I	A/R	I	A/R	I	**I**	I	C
Procurement of organic waste processing solution	I	I	C	I	A/R	I	A/R	I	**I**	I	C
Commence and operate kerbside organic waste collection service (pending individual council approval)	I	I	C	I	A/R	I	A/R	I	**I**	I	R
Continuation of self-haul green waste receipt and processing	**I**	I	NR	I	A/R	A/R*	A/R	A/R	A/R	A/R	NR
Roll out of community composting solutions including guidance	A/R	I	NR	I	R	R	R	R	R	R	NR
Collaborate on regional solution for finding highest value market for green waste across region	C	C	NR	R	A	A*	A	A	A	C	C
Develop regional solution for biosolids and timber	I	C	I	R	A	A*	A	A	A	C	I
Develop pathway to improve non-Council held data collection	A	C	NR	R	C	C	C	C	C	C	A
Material recycling and recovery											
Participate in Education and Behaviour Change Initiative (assumed continuation) and develop regional education strategy, implement	R	I	C	I	A	A	A	A	A	A	NR
Review & agree pathway for improved enforcement activity for poor household behaviours in kerbside bin service provision, and implement	A/R	I	I	I	A/R	A/R	A/R	A/R	I	A/R	C
Seek opportunities to collaborate on regional collections approach when contracts allow	C	C	C	I	A	A	A	A	A	A	C
Develop business case, designs for new or improved transfer facilities	C	I	C	I	A*	A*	A*	A*	A*	A*	I
Construct and commission upgrades or new transfer facilities	C	I	C	I	A*	A*	A*	A*	A*	A*	I

Action	RACI										
	QGOV (DES)	QGOV (DSD)	Project & Funding Support Function	RRWG	Bundaberg Regional Council	Cherbourg Aboriginal Shire Council	Fraser Coast Regional Council	Gympie Regional Council	North Burnett Regional Council	South Burnett Regional Council	Industry
Collaborate on establishment of regional scale precinct and ancillary satellite sites in accordance with precinct guidelines	C	A	C	R	R	R	R	R	R	R	C
Construct enabling infrastructure for precinct	C	A/R	A	I	I	I	I	I	I	I	C
Establish new resource recovery processing facilities within precinct	C	A/R	A	I	C*	C*	C*	C*	C*	C*	R
Work with Queensland Government agencies to improve uptake or recycled materials in procurement	A	A	I	I	R	R	R	R	R	R	C
Develop pathway to improve material flow data and knowledge across region for recyclable material	A	C	NR	R	C	C	C	C	C	C	C
Collaborate to collect data on contamination within kerbside bins to improve education approach.	C	I	NR	R	A*	A*	A*	A*	A*	A*	NR
Residual waste management											
Councils to consider individual landfill capacity needs in short-medium and long-term	I	I	NR	I	A/R*	A/R*	A/R*	A/R*	A/R*	A/R*	NR
Consider long-term options and approach to managing residual waste in the long-term, pending availability of facilities out of region	C	C	C	I	A/R*	A/R*	A/R*	A/R*	A/R*	A/R*	C
Develop long-term approach to managing problem and emerging wastes	C	I	NR	R	A/R*	A/R*	A/R*	A/R*	A/R*	A/R*	C

Responsibility highlighted in BLUE indicates owner(s) of the activity.

7.5 Cost estimate

A high-level cost estimate for implementation of this Plan has been developed for the period between FY23-24 (year 1) through to FY30-31 (the year to which regulated changes to the AAP has been forecast). Costs should be assumed with a level of accuracy than p50 be considered indicative, and subject to change as Plans are refined and the level of funding available is confirmed. The estimated cost for implementation (excluding residual waste management) is **$84 million** over the period FY30-31. A breakdown is presented in **Appendix D**.

7.6 Funding

Funding needs to support implementation of the preferred option has been identified within Sections 4-6 as specific to initiatives across each stream. The following summarises prospective funding sources.

7.6.1 Local Government funding & financing

Local government can fund the provision of resource recovery infrastructure and initiatives through Council revenue, which is primarily derived from municipal rates, other duties and charges, or transfers from Federal and State Governments. Depending on the population size, Local Governments often have limited resources to directly support capital investment in resource recovery infrastructure and initiatives.

7.6.2 Private sector funding & financing

The significant capital costs to construct and deliver the packages suggests that co-funding with non-government organisations and private sector proponents may be viable. The private sector can participate in a variety of capacities, from concept and design, to construction, operations, and maintenance. They can also provide financing to a greater capacity than the public sector and relieve Local Governments of borrowing constraints. However, by assuming financial risk in the proposed project, the private sector will require confidence in an expected return. The private sector will typically be involved in two ways – a traditional public-private partnership (PPP) model, or through complete ownership of the process and operations. Local Government may attract private sector investment by providing land, concessions, guaranteed feedstocks, or product offtake agreements. Private funding is most likely to be sought for options that incur high capital costs such as anaerobic digestions or an energy from waste facility, or for facilities where private sector expertise and innovation are critical.

7.6.3 State Government funding - Annual Advanced Payment for Local Governments

The forward estimates for the period to FY25-26 has resulted in the payment of $40.95 million to the region in annual advanced payments. Cherbourg Aboriginal Shire Council sits outside the levy zone and has not received annual advanced payments. For Gympie Regional Council, North Burnett Regional Council and South Burnett Regional Council these payments are expected to be used to offset the amount paid on the levy to avoid passing those costs on to households. As they are based on forecast from previous years landfilled amounts it is feasible that the amount may vary and be less (or more) than paid, however recent legislative changes allow for top up at the discretion of DES. For Bundaberg Regional Council and Fraser Coast Regional Council, who have received around $13 million each, their landfill levy liability is expected to be significantly higher than this amount over the same period and this differential will continue to grow significantly over the period to FY30-31. Annual advance payments are not perceived by Councils as a significant source of funding.

Annual advanced payments form part of the Queensland Governments $2.1 billion waste and recycling package, which includes the $1.1 billion jobs and recycling fund. This funding, allocated over a 10-year period to FY30-31 is identified as the funding mechanism to implement this Plan. Some funding has already been announced; however, it is intended that this Plan will help to shape funding required for the Wide Bay Burnett region. This includes one-off-costs to make transitions (e.g., the cost of FOGO bins) plus longer-term funding support.

7.6.4 State Government funding – Infrastructure

Funding from the State Government typically occurs in the form of direct investments, grants, and subsidies. The State may provide cash transfers to local governments, direct investments in projects, or offer low-interest loans.

Queensland Treasury Corporation (QTC) is the central financing authority for the Queensland Government and provides financial resources and services to the State. Typically, QTC does not provide project-specific funding for Local Councils so Councils should seek resource recovery infrastructure funding from QTC as part of their annual funding request (i.e., whole of Council funding). There may be potential for a group of Councils to set up a special purpose vehicle (SPV) to request funding for a specific project as a group, however, there is no precedent for this.

Access to grant funding from the State typically requires the proponent and the project to meet a certain set of criteria which may include funding requirement, potential economic impact, location, partnership arrangements with the private sector and several other factors. Relevant to Councils, grant funding may be dependent on the location and scale of the proposed infrastructure. Resource recovery facilities in larger LGAs are likely be self-sufficient owing to the expected scale and output of the facility and therefore may not require grant funding. However, small facilities may rely more on grants and transfers from the State as their revenue may be uncertain and slow to achieve.

The Federal Government may be able to fund the delivery of the project however, the benefits for the broader Australian economy would need to be explicitly demonstrated. A concessional loan from facilities such as Northern Australia Infrastructure Facility (NAIF) or the Clean Energy Finance Corporation (CEFC) may be appropriate as these loans can be offered below the market rate of interest and often provide other benefits such as long payback periods, grace periods in which only interest or service fees are due, and interest holidays.

Public funding may be used for low to medium technology options, such as organics composting (e.g., open windrow or similar), local community solutions including community composting and repair hubs, funding for education and landfill expansion.

7.6.5 Government funding – Subsidising & supporting new systems

Financial mechanisms for resource recovery operations vary widely however, operational expenditures must be financially self-sustaining. There are recent and relevant examples of failed resource recovery projects in Queensland that utilised grant funding for capital expenditure however, ultimately collapsed due to the inability of the owner to support operational costs. Operational expenditures can be managed through traditional methods of improving businesses' processes and maximising revenue streams, including gate fees, and selling products such as compost.

Australian Carbon Credit Units (ACCUs) may also be utilised to secure ongoing financing. ACCUs are a financial instrument awarded to eligible energy efficiency, renewable energy generation and carbon sequestration projects that result in a reduction of greenhouse gas (GHG) emissions. One ACCU represents the avoidance or removal of one tonne of carbon dioxide equivalent GHG. CCUs are a financial product that can reduce the total capital expenditure for an emissions reduction project. ACCUs are traded or sold on the national environmental commodity market, through carbon market agents, to organisations looking to offset their carbon footprint or meet emissions reduction obligations. ACCUs are also purchased by the Federal Government in a commitment to decarbonise Australia's economy through emission reduction projects.

7.6.6 Government funding – non-infrastructure

Through the delivery of grant programs additional funding may be provided by the Queensland or Commonwealth Governments to support non-infrastructure solutions. These include education, such as the already commenced support program for improving kerbside behaviour support, or the roll out of love-food-hate-waste education packages. These programs should be developed to account for the non-infrastructure interventions presented in this Plan to support participation and education activities across the region.

7.7 Managing change

It is expected that the economic, environmental, and technical assumptions that this Plan is based on will change over the next 10-years, as documented in the individual stream sections. It is important that in implementing the Plan, the RWWG is aware of and able to respond or react to disruptions caused by policy change, industry, or technology. The biggest potential disruptors are:

- Changes to the levy rate (beyond the forecast CPI increases) and annual advanced payments (beyond the current state) – the potential introduction of a reduction in annual advanced payments to those Councils in the region who currently receive the full levy amount returned. Even the gradual reduction in payment would likely increase the cost of waste management for ratepayers within these Councils whilst adding limited resource recovery or other benefits.
- Policy changes imposed by the Queensland Government or Commonwealth Government that have a direct impact on the services provided by Councils (e.g., the introduction of landfill disposal bans or mandatory collections).
- Changes to the composition of waste within household and other streams due to action taken by the Commonwealth Government on imported materials.
- The change in packaging materials, particularly an increase in the type of packaging used to favour a greater proportion of recyclable packaging.
- The development of new technologies, or the establishment in Australia of technologies that are more commonly deployed elsewhere in the world (e.g., proven small-scale EfW technologies or anaerobic digestion).

7.8 Monitoring and review

Responsibility for monitoring of this Plan will reside with member Councils under the overall leadership of the WBB Region. It is expected that Plan implementation will reside with the RRWG under the WBB Region. Key metrics to be monitored area:

Table 29 Monitoring parameters

Criteria	Measurement	Rationale
Establish a regional delivery mechanism to support Plan implementation	Mechanism in place by 31 Dec 2023	To facilitate implementation of the regional Plan a mechanism should be formalised and in place by 31 December 2023 to maintain momentum.
Action tracking and accountability	Working group develops action tracking register with specific dates for action of key players. Project Management tracking against actions. Quarterly updates reported back to Councils.	The implementation of the Plan has a series of actions, and sub actions to deliver. These actions require allocation to specific Councils or other actors (e.g., State Government) who should be held to account. Project Management reports should be prepared Quarterly to track progress and correct delays.
Regional Targets		
Contamination percentage in comingled kerbside recycling	Measurement of contamination via standard methodology reported at least annually.	To measure impact of behaviour, change program in achieving target of <5% contamination.
Regional resource recovery target (all streams)	Current: 52% 2030: 59% 2040: 65%	To measure long term progress and commitments under Plan to achieving regionally specific resource recovery target rates. This assumes that organics diversion commences in Bundaberg and Fraser Coast prior to 2030.
Organics specific targets		
Regional organics diversion target (kerbside household organic waste)	Current: 0% 2030: 24% 2040: 30%	This Plan sets out the potential for organics diversion rates for kerbside organic waste.
Organics collection contamination rate	Current: Baseline to be established 2030: <5% 2040: <5%	Where service provided, data will be collected on contamination rates as a proxy for effectiveness of education and awareness campaigns.
Kerbside recycling specific targets		
Regional kerbside recycling diversion target (excluding organic waste)	Current: 19% 2030: 25% 2040: 27%	Diversion rate to increase because of education but excluding organic waste diversion. Measured by Council data records, annual returns.
Kerbside recycling tonnes (material collected at the kerbside sent for recycling)	Current: 19,478 tonnes 2030: 28,500 tonnes 2040: 33,000 tonnes	Target takes account of increased population but also improved capture of material from the residual bin (plus recently introduced service in South Burnett)
Regional kerbside recycling contamination rate	Current: 16-18% 2030: <5% 2040: <2%	Contamination rate to be measured through audits undertaken by participating Councils.
Residual waste monitoring		

Criteria	Measurement	Rationale
Collect data on type and management fate of residual waste	No specific target	As a function of other streams, the regional should continue to monitor how residual waste is managed to facilitate future opportunity development. Revisit relevance of targets if long-term solution is developed.

Appendix A:

Investment Logic Mapping & Strategic Rationale Outcome

Problem / opportunity	Benefits	Strategic responses	Solution options	
Some landfills in the region are approaching capacity, which will prohibit further landfilling, and require further diverse investment to enable appropriate management of residual waste	Reduction in potential resources to landfill	Update regional waste reduction targets	Do nothing	Investigate highest value for money secondary raw material streams for each LGA
Individual Councils do not have sufficient scale for processing and remanufacturing recyclable materials or residual waste (given the cost of transport and geographic size of Councils) limiting the ability to achieve resource recovery at a commercial scale	Reduction in all waste generated	Educate community and industry on better resource recovery practices	**Reform**	Investigate raw material streams with the highest environmental impacts for each LGA
There are insufficient local end markets for secondary raw materials (except FOGO/GO, where there is insufficient supply in the region), limiting the ability to achieve commercial rates of return	Reduction in environmental impacts (leachate, landfill, fires etc.)	Legislative/regulatory action including state and local government policy to reduce waste to landfill	Change/expand/review local Council policy, procurement and standards to incentivise use of recycled material	Facilitate investment attraction in resource recovery services or support existing providers to enhance their service offerings
A lack of community understanding/concern around the increasing cost and environmental impacts of waste management and absence of incentives/disincentives for households to improve behaviours is contributing to inefficient waste management practices	Reduction in illegal dumping and other illegal waste management practices	Collaborative approach to waste management in the region	Advocate for State Government and industry policy, procurement and standards to incentivise use of recycled material	Advocate for waste transport assistance/funding for recyclables and waste to energy inputs
There is an opportunity to develop and support new and innovative resource recovery industries as well as create regional and local economic and community benefits through collaborative waste management planning between WBB councils and the broader region	Improved waste management practices	Incentivise resource recovery	Implement local, targeted landfill bans for certain products	**Improve existing**
The objectives and targets in the *Queensland Waste Management and Resource Recovery Strategy* and *National Waste Policy Action Plan* cannot be met with existing infrastructure, initiatives, funding, resourcing and supporting policy in WBB	Improved resource recovery and reuse	Invest in new or upgraded resource recovery infrastructure	Invest in compliance and enforcement of regulations	Mine resource from existing landfills
	Increased downstream industry capacity and resulting economic activity in WBB		Establish formal governance arrangements for the region	Create additional landfill disposal capacity
	Reduction in methane emissions and carbon emissions (due to better waste management)		Research into future potential waste streams	Expand (geographically) household source separation i.e. recycling and/or organics bin collections
	Better engaged and empowered community		R&D for waste avoidance, minimisation processing and reuse	Provide household organics solutions (where viable)
	Increase in local skilled jobs		**Better use**	Regional collaboration to purchase mobile plant and equipment/long term service contracts to service the broader region
	Improved value for money of waste management (environmental, social, economic, infrastructure)		Regional, targeted and specific education campaign that encourages better consumer behaviour to avoid waste generation, improve source separation and promote circular economy objectives	Optimise/expand existing facilities
	Development of circular economies for recovered materials		Investment in Councils' staff education (capacity building)	Develop product stewardship hubs
	Ability to meet State and Federal targets		Improve data collection and reporting	**New**
			Advocate for new/expanded product stewardship schemes	Investigate potential for development of a waste precinct, including partnerships with industry
			Investigate commercial viability of waste transportation to and/or from other regions/private facilities	Construct new transfer stations in strategically located areas
			Undertake strategic waste management assessment and mapping of LGAs to determine local capacity and constraints and suitable areas for infrastructure development	Construct materials recovery facilities in strategically located areas
				Construct new processing facilities (MSW, C&D, C&I) in strategically located areas
				Construct an energy from waste facility (residual waste)

Appendix B:

Waste Flow Model Assumptions

B1 Modelling Methodology

The following works have been undertaken:

Step 1 - Data Request

- Prepared and issued formal data requests to each Local Government Area (LGA)

Step 2 - Review of Information

Review of available information including:

- Suitability for use / data quality
- Data type (arisings, infrastructure, materials/service, and cost factors).
- Completion of data gap analysis
- Review of future policy and legislative requirements

Step 3 – Stakeholder Engagement

- Attended initial project inception meeting with the working group established by councils to develop the Regional Waste and Resource Recovery Plan
- Developed baseline status and forecasting for inclusion in WBB Interim Report
- Undertook Options Assessment and Multi Criteria Analysis (MCA) Workshop with key LGA stakeholders to discuss findings of WBB Interim Report.
- Additional follow up sessions with relevant LGAs and Department of Environment and Science (DES) to validate data / address identified data gaps provided to inform waste flow forecasting.

Step 4 - Modelling

- Develop forecast scenarios to analyse variation of generation rates, recovery rates, processing, and landfill demand scenarios for different waste streams
- Develop predictive scenarios based on population change within the region

B2 Data sources

The following State-wide primary data sets reviewed during the development of this model include:

- Queensland Waste Data Survey (QWDS) – Waste Arisings
- Queensland Waste Resource Recovery Infrastructure Report (QWRRIR) – Waste Infrastructure
- Recycling and Waste Collection Options Tool (RAWCOT) – Waste Materials/Service

In addition, the following WBB specific data sets were reviewed such as local waste audits / independent studies not captured under the above as summarised below:

- Council responses to the DES Annual Waste Data Survey
- Council data provided for the Queensland Waste and Resource Recovery Infrastructure Report (2019)
- Council waste management strategy, operational planning, and reporting documents
- Council infrastructure data including remaining airspace
- Council waste site and facility statistics
- Australian Bureau of Statistics government population and householder forecasts
- Studies, business cases and other documentation prepared at a council or regional scale to inform the development of new or optimised services for collection or post-collection
- Workshops, interviews and discussion with regional working groups, councils, mayors, CEOs, councillors, economic development, waste management.

A full list of data sources used is presented in **Table C1** below.

Table B1 Data sources

Title / Dataset	Date	Provided by	Summary
2015-16 WBBROC_Regional_Waste_Strategy_Final	2015-20	WBBROC	regional waste strategy
20171101 ATCW COM Transport Analysis	11/1/2017	ATC Williams	Transport Analysis – Centre of Mass
20171101 Figure 1 - haulage routes	2017	ATC Williams	regional waste transport network infrastructure map
2021_22_23 Annual Tonnage and Levy Liability (A5833502)	2019-2023	WBBROC	annual tonnage data
2022 Forecast Life of Landfills	2022	WBBROC	forecast life of landfills
620.31107-WBB-RWMP-RFI-01	5-Aug-22	WBBROC	RFI on WtE feasibility study 2020
AECOM Report. Note: Title is Implementation of Regional Waste Strategy Feasibility Study - Options Paper	24-Jan-18	WBBROC	"Implementation of Regional
BRC Waste Fees 202223	2022-23	WBBROC	Waste Strategy Feasibility
BRC_Waste_Management_and_Resource_Recovery_Strategy_2017___2025 (5)	Jan-17	BRC	Study - options paper"

Title / Dataset	Date	Provided by	Summary
Bundaberg Council - RAWCOT - 5 August 2020 (A7060956)	2020	Ricardo	waste disposal fees
Cedars Airspace Option Ltr 6.6	6-Jun-16	BRC	"WASTEMANAGEMENT& RESOURCE
Cedars Road Landfill Development Plan 2019	7 November 2019	ATC Williams	RECOVERY STRATEGY
Confidential - FINAL Report updated - Waste to Energy Feasibility 2020	16-Apr-20	Ricardo	2017–2025"
FW Waste Reserves Spreadsheet and historic information	Monday, August 22,	BRC	resource and waste collections options tool
Local Government Survey 2021 (2020 - 2021) (A6187963)	2021	BRC	Cedars Road landfill Airspace 2015 – 2035
QTC Analysis - New Regional Landfill information	2021?	QTC	BRC - update to the 2013 Cedars Road Landfill Site Development Plan
Qunaba Landfill Development Plan 2019	7-Nov-19	ATC Williams	Regional Waste Strategy for WBBROC – Waste to Energy Feasibility Study
SLR Info Request BRC	September 5, 2022,	BRC	Email thread, no data, refer to financial summary fund PDF
SLR Information Request - Items 1 - 17 (A7098998)	5-Aug-22	BRC	local government survey on waste services/ composition
University Drive Landfill Development Plan 2019	8-Nov-19	ATC Williams	New Regional Landfill information
Waste Collections Business case for the introduction of a Food Organics and Garden Organics Service in 2026 (A6429083)	8/19/2022	BRC	BRC - update to the 2016 Qunaba Road Landfill Site Development Plan
Waste Service charges 202223	2022	BRC	SLR Info Request BRC
Waste Services - Monthly Budget Report - June 2022 Alt version	Jun-22	BRC?	completed RFI by BRC from SLR
2019003 Maryborough Landfill Optimisation - Rev 2	31-Mar-20	Maryborough Landfill Optimisation	"Update to the 2013 the
CTWW008 - Waste Services Contract 2020 - Material Recovery Facility Feasibility Assessment - Redacted Version - Specification At	29-May-20	Fraser Coast Council	site development plan (SDP) for University Drive Landfill"
DOCSHBCC__3854587_v2_FINAL___Fraser_Coast_Waste_Strategy_2019_2029	2019	Fraser Coast Council	Waste Collections introduction of a Food Organics and Garden Organics service in 2026
FCRC FCP MODEL v15.0	2020	Fraser Coast Council	waste disposal fees - long term financial plan
2022_DES-Waste-Survey-Final_Local Government	2022	DES/NBRC	XL SS with monthly budget report
620.31107-WBB-RWMP-RFI-01	5-Aug-22	NB	Landfill Optimisation Study for the Maryborough Landfill which will inform the extent and design criteria for Cell 9
Confidential - FINAL Report - Waste to Energy Feasibility 2020	see row 013	see row 013	"MRF Feasibility Assessment -

Title / Dataset	Date	Provided by	Summary
Confidential - FINAL updated Waste to Energy Feasibility presentation 2020	15-Apr-20	Ricardo	derives from basic assumptions and the general direction from Council's Waste Strategy 2019-2029 (Waste Strategy), yellow lid bin composition surveys from other comparable councils and the research performed by the Waste Services team."
NBRC-Waste-Reduction-and-Recycling-Plan-2021-26-020821	7/28/2021	North Burnett Regional Council	waste Strategy document
2022_DES-Waste-Survey-Final_Local Government	2021-22	DES/South Burnett Regional Council	FRC financial model
Master facility Register_Fixed	31/08/2019	Arcadis	waste survey for local government
2019 Operator Site_Updated LH	18/19	Arcadis	North Burnett response to SLR RFI
LG Survey Qual responses	18/19	Arcadis	WBBROC Waste to Energy Feasibility CEO and Mayors Briefing
018 QunabaTransfer Station Opinion of Probable Cost_draft_18.12 Draft Rev	19-Dec-13	AECOM	waste reduction and recycling plan 2021-26

B3 Model Assumptions

Assumptions

Regional waste projections have been developed (see Figure 2) based on the data sources and assumptions summarised below:

- Medium population projection applied
- Per capita generation rates (tonnes per capita) calculated from historical population and waste data
- Two-year historical average per capita rate applied to all waste streams and all councils.
- Historical waste quantities and generation rates are prone to inter-yearly fluctuations due to administrative issues including reporting changes, or underlying changes to consumption.
- Economic and social factors influence what residents and businesses buy, use, consume and dispose of, which is particularly relevant considering COVID-19 induced restrictions.
- Variations are especially prevalent with C&I and C&D waste as these streams are dependent on a range of external market forces and can be price sensitive.
- The Queensland Waste and Resource Recovery Infrastructure Report (QWRRIR) outlined trends in waste generation rates and their relationship with GDP to determine if an adjustment factor might be applied. However, no conclusive adjustment factor was determined due to data quality concerns and inconsistency in waste tonnage data reporting back to 2010-2011.
- At a national scale, the National Waste Data Report 2020,5 reported a 20% reduction in per capita generation of waste for MSW and C&I over a 13-year period, equating to an annual decrease of approximately 2.5%. However, analysis of regional waste generation rates does not support this.

Regional waste projections have been developed based on the assumptions summarised below:

Table B2 Model Assumptions

Title	Input	Description
Population Scenario	Implied Compound Annual Growth Rate (CAGR) of 0.9% for 2021-2031 and 1.0% 2021 to 2041 Medium population projection has been applied	CAGR and Medium population scenario applied based on existing QLD State government forecasts: Projected Populations - sourced from QLD Government Statistician's Office (2019) *The State of Queensland, Queensland Treasury, 2022. Projected-dwellings-series-local-government-area-qld-2016-2041.xlsx* accessed at: https://www.qgso.qld.gov.au/statistics/theme/population/population-projections/regions Historical Population - sourced from Queensland Government Statistician's Office (2022), *The State of Queensland, Queensland Treasury, 2022. Estimated-resident-population-lga-qld-2001-2021pr.csv* accessed at: https://www.qgso.qld.gov.au/statistics/theme/population/population-estimates/regions
Generation per capita	Assumed kerbside yield (kg/capita):	Generation per capita
Bundaberg - 334		Bundaberg - 334

Title	Input	Description
Recycling Bin	**80% Default bin coverage**	Default bin coverage assumption based on Council of Mayors Southeast Queensland (COMSEQ) SEQ Waste Management Plan, Final Report 2021.
Organic Bin Assumptions	100% proportion of food organics can go in Food Organic and Garden Organic (FOGO). 0% proportion of food organics can go in GO 100% proportion of garden organics can go in FOGO 100% of garden organics can go in GO. 80% Default Organics bin coverage 14% Additional GO from service introduction (based on yield per person). 5% Loss of self-haul GO due to FOGO service introduction (best guess estimate / nothing reported).	Organic bin assumptions based on COMSEQ SEQ Waste Management Plan, Final Report 2021. Capture rates based on existing services and review across NSW from Analysis of NSW Food and Garden Bin Audit Data, RAWTEC (2018) FO: High (50%), Med (35%) & Low (25%) GO: High (95%), Med (85%) & Low (75%)
Residual Waste Recovery Options	90% Energy for Waste (EfW) 80% Refuse Derived Fuel (RDF)	Nominal recovery rates for EfW assuming Air Pollution Control residues will be disposed to landfill and assuming bottom ash has a viable recovery option such as base material for road construction. Recovery rate for RDF assumes estimated 25% loss of materials required to meet RDF acceptance criteria (defined by moisture content and calorific value)

Appendix C:

Economic Analysis Report

www.pwc.com.au

Regional Waste Management Plan - Cost Benefit Analysis

Wide Bay Burnett Regional Organisation of Councils

September 2023

pwc

Strictly private and confidential

Disclaimer:

This report is not intended to be read or used by anyone other than Local Government Association Queensland Ltd (LGAQ).

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We accept no responsibility, duty or liability:

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Contents

1 Introduction

The purpose of the report is to evaluate the economic viability of implementing the Regional Waste Management Plan package solutions in the local government areas (LGAs) which make up the Wide Bay Burnett Regional Organisation of Councils (WBBROC) region. This chapter includes:

- Project context
- Project objectives
- Study area.

1.1 Project context

Wide Bay Burnett (WBB) Councils have identified that there is a strategic need to improve regional waste management and resource recovery practices. Landfills are an essential component of Australia's waste management system, and currently landfills in the WBB region receive approximately 49.5 per cent, or 197,000 tonnes of headline waste and provide a final disposal solution for waste that cannot be recovered.[1] The WBB region contains nineteen identified active putrescible landfills that are all council-owned, of which fourteen are small or very small rural facilities.[2] The resource recovery infrastructure in the region includes eight composting, four mulching, three MRFs, two source separated recycling, and two metals recycling facilities. There are no existing C&D recycling facilities identified in the region. Each LGA has a principal landfill, with landfills in the region generally developed in existing holes, usually formed by quarrying or mining operations and as such, landfill lifespans are inherently finite. At the end 2021, it was announced that there would be a differential levy rate for waste generated in some LGAs, as well as a progressive reduction in the differential annual advanced payment to the 2030-31 financial year. In WBB, the annual advanced payment for Bundaberg Regional Council and Fraser Coast Regional Council will reduce from 105% to 20% by FY30-31. For all other councils except Cherbourg Aboriginal Shire Council, who sit outside the levy zone, annual advanced payments are scheduled to continue at 100% over the same period, however, this determination is set to be reviewed in 2025. Therefore, it is critical that waste is increasingly diverted from landfill to ensure Councils and ratepayers are minimally impacted.

To achieve reduced waste to landfill, improved recycling and resource recovery practices are required, however there is currently a poor understanding of the costs and benefits. The scale of waste generated by individual LGAs in the WBB region is relatively small, with significant distances and dispersion between populations and resource recovery and waste disposal infrastructure. Due to the region's geographic dispersion, transport costs are often prohibitive and there is currently insufficient scale locally for commercially viable resource recovery exclusively in the region. Councils are unable to collect or sort a commercial amount of recycled materials, resulting in a lack of recovered materials for processing and remanufacturing. As a result, it is difficult to attract downstream industries and private investment to the region. Furthermore, there is often a lack of community understanding around waste management and little incentive to improve practices, resulting in waste disposal to landfill. Without intervention, WBB LGAs will find it difficult to meet the objectives and targets in the Queensland Waste Management and Resource Recovery Strategy and National Waste Policy Action Plan.

In response to this, SLR and PwC have been engaged by the LGAQ to undertake the development of a Regional Waste Management Plan (RWMP) to confirm the strategic need, investigate potential options to improve waste management and resource recovery practices in the region, and to find agreement on a collaborative pathway forward for councils in the region. Implementation of the plan to achieve agreed strategic outcomes will support access to the announced $2.1 billion funding for waste and resource recovery activities announced by the Queensland Government in late 2021. This Cost Benefit Analysis (CBA) considers the solutions as discussed and agreed upon by the WBBROC Waste Management Group.

[1] Arcadis for Department of Environment and Science (2019). Queensland Waste and Resource Recovery Infrastructure Report. Accessed at https://www.qld.gov.au/__data/assets/pdf_file/0034/199249/qld-waste-resource-recovery-infrastructure-report.pdf

[2] Very small = < 2,000 tonnes to landfill p.a. Small = 2,000 to 10,000 tonnes to landfill p.a.

1.2 Project objectives

The objectives of the overarching Plan are to:

- Maximise the value of waste, including problematic waste streams
- Deliver the best pathway for the region that identifies opportunities for government co-funding arrangements, and industry investment or co-investment
- Provide councils with the data and options analysis required for them to make informed decisions about policy, location of infrastructure and optimal value for money investment, and non-infrastructure options
- Support improved waste management, resource recovery and recycling practices to contribute towards agreed regional and State targets
- Encourage and support opportunities to embed circular economy principles into business-as-usual practices, including through sustainable procurement principles
- Encourage and support job creation and economic and market development opportunities
- Improve environmental outcomes for the community
- Identify non-infrastructure and social and community benefits
- Establish and maintain collaborative relationships with key stakeholders to drive long-term sustainable outcomes.

The intention of the Plan is to provide long-term direction to 2050 of the needs of the region in terms of critical waste streams, infrastructure, and the identification of a particular suite of levers required to achieve regionally specific and agreed targets. Specific activities and actions in the short- to medium-term are identified, where there is a relatively high degree of certainty in process and outcome. Longer-term activities and actions are expected to be implemented later in the program of works or require further refinement and development. It is anticipated that the plan will require a degree of flexibility.

The scope of the Plan is defined by engagement with stakeholders. Focus is on waste and recyclate typically managed within the region by local government. In regional Queensland, local government often manages large proportions of the commercial and industrial (C&I), and construction and demolition (C&D) waste streams, due to the absence of private post-collection processing facilities. Activities and actions will be identified in the Plan for key streams, with a view to continuously seek opportunities to capture new and emerging or problematic streams as implementation progresses.

The Plan aims to seek a balance between defining a clear implementation plan for the best whole of system outcome for the region, while reflecting the needs and wishes of each individual council and their rate payers, with the base assumption to minimise cost impact to councils and current waste operations.

1.3 Study area

The WBB region comprises of the LGAs of Bundaberg Regional Council, Cherbourg Aboriginal Shire Council, Gympie Regional Council, North Burnett Regional Council, and South Burnett Regional Council. Where appropriate, the Plan may look outside of the region to neighbouring regions or individual Councils for benefit of Plan implementation. The WBB region has a total land area of 48,600 km² and an Estimated Resident Population (ERP) of 310,728 people as of 2021and is forecast to grow to around 360,000 in 2041.[3] Approximately 113,961 residents are employed. [4]

The WBB region has a varied economic base and benefits from a diverse natural environment and liveable cities. Its broad industry base and strategic position to provide goods and services to domestic and international markets is supported by access via the Port of Bundaberg, multiple intraregional highways, proximity to SEQ and numerous regional and local airports. The region's Gross Regional Product (GRP) is estimated at $14.2 billion,[5] representing 3.8% of Queensland's

[3] Based on medium series projections by the Queensland Government Statisticians Office.
[4] Economy ID (2021). Regional development Australia Wide Bay Burnett Region economic profile - population & employment. Accessed at https://economy.id.com.au/rda-wide-bay-burnett/employed-residents
[5] Economy ID. Regional development Australia Wide Bay Burnett Region economic profile – gross product (2021). Accessed at https://economy.id.com.au/rda-wide-bay-burnett/gross-product

estimated Gross State Product (GSP) of $366.3 billion.[6] The waste management and resource recovery sector is already an important contributor to the economy, however, there is further potential to grow the sector by improving recovery of resources and investing in the resource recovery industry.

[6] REMPLAN. Queensland Economic Profile, Gross Regional Product (2021). Accessed at https://app.remplan.com.au/eda-queensland/economy/industries/gross-regional-product?state=KbP5hX!PmxBTYqwaTrJxRnhY2d5PH0hAfYBghmf3fZIwf80d

2 Economic appraisal framework

This chapter outlines the economic appraisal framework implemented to assess the packages against the base case to recommend the most economically viable option for implementation in the RWMP. This chapter includes:

- Overview
- General approach and limitations
- Cost benefit analysis methodology.

2.1 Overview

The economic analysis was undertaken using a cost benefit analysis (CBA) framework that applied discounted cash flow techniques, in accordance with Infrastructure Australia (IA) guidelines. The CBA assesses the benefits and costs of the project options to evaluate whether incremental benefits exceed the incremental costs of achieving them.

The key steps undertaken in developing the economic appraisal are:

1. **Establish the economic appraisal framework:** Defines the approach and overarching methodology to be used for the economic appraisal and determine the key modelling assumptions.
2. **Define the Base Case and project option scenarios:** Defines the Base Case, which represents the counterfactual against which the project options will be assessed and defines the project options.
3. **Develop and incorporate cost estimates:** Incorporates delivery and operating phase cost estimates associated with the project options, and relevant costs for the Base Case, into the economic appraisal.
4. **Identify and quantify economic benefits:** Estimates the incremental benefits for the project options based on a range of inputs using economic assumptions/parameters. The economic benefits framework has been designed to reflect the impacts of the Project on user groups in society.
5. **Economic appraisal:** Involves discounted cashflow assessment within a cost benefit analysis framework to determine key metrics including the benefit cost ratio (BCR) the net present value (NPV).

This chapter is structured to provide a summary of each of the steps above.

2.2 General approach and limitations

CBA is an economic analysis framework that examines the broad range of economic, social and environmental impacts of a proposed initiative across all affected stakeholders. A robust CBA requires:

- Costs and benefits to be expressed as far as possible in monetary terms to allow options to be compared on a consistent basis
- Results to be discounted to ‘present value’ terms to allow for consistent comparison of impacts that may occur at different points in time
- The valuation of costs and benefits based on the impacts they have on the community as a whole
- A holistic approach that considers and quantifies impacts across all impacted parties, rather than a specific project proponent or stakeholder. The WBB region member LGAs are the referent group in this CBA.

2.2.1 Assumptions

The initiative is in early stages of analysis and as such, a number of assumptions were made to define the inputs for the analysis and to undertake the CBA. The results of this CBA should not be relied on to form an investment decision and it is recommended that a detailed assessment of individual option components is undertaken. The broad assumptions include:

- A detailed quantification of costs was not undertaken for the options packages. All capital and operating cost assumptions were provided by SLR and are indicative and based on professional experience and benchmarking, supplemented with desktop research. They represent basic building costs (where appropriate) and typical processing costs. Land acquisition and site preparation costs are excluded.

- Arcadis provided detailed waste generation data and waste flow modelling to determine potential volumes of resources that may be recovered under each package. PwC did not perform a detailed review of data quality or integrity and all data is assumed to be appropriate for the purpose of this CBA.

2.3 Cost benefit analysis methodology

CBA uses discounted cash flow analysis to convert future costs and benefits to a common time, the present value (PV). PVs are calculated by discounting future values using IAs recommended real discount rate of seven per cent per annum (which reflects the time value of money). These discounted costs and benefits are then used to produce conventional CBA measures of economic performance, including:

- **NPV** – the difference between the PV of total incremental benefits and the PV of the total incremental costs, which allows the project options to be compared on the same basis to determine the greatest net benefit to the community or the most efficient use of resources

- **BCR** – ratio of the PV of total incremental benefits to the PV of the total incremental costs. A BCR greater than 1.0 indicates that quantified project benefits exceed project costs. However, projects with BCRs less than 1.0 may still be considered to have net benefits if some of the benefits cannot be fully captured within an economic appraisal framework, for example, where data is unavailable to quantitatively measure additional benefits expected to result from the project.

These economic metrics are part of a broader initiative valuation process and should be considered in conjunction with non-monetisable costs and benefits, the results of a financial analysis, and the potential economic impact on the region. Revenues exceeding costs is not a sole reason to proceed with a project. It is essential to also consider community and social costs, as a project that causes significant harm to the community may not have a direct financial cost, however, could still be damaging. If the BCR is below one, the project may still be suitable for government investment provided there are other project benefits which were not able to be monetised and included in the BCR (e.g., social benefits). The CBA uses both market and non-market monetisable costs and benefits to ensure impacts to the referent group are captured. Non-monetisable costs and benefits are detailed but are not quantified.

2.3.1 Parameters

This analysis requires a range of general assumptions which have been developed in line with relevant guidelines, preliminary technology considerations and scoping of the project. The general assumptions are outlined in Table 1 and form the basis of the economic model. These are subject to sensitivity testing as appropriate.

Table 1: General economic analysis assumptions

Assumption	Value	Comment
Base year	FY23	The base year is the year the evaluation is conducted as the CBA is forward looking. Any costs of benefits incurred in the past years are treated as sunk and excluded from the analysis.
Pricing year	FY23	All values are expressed in FY23 dollars, in the year they are expected to be incurred.
Appraisal period	Construction + 30 years of operation	Commencement of operations of the first implemented solution (2023).
Discount rate	7%	Consistent with Queensland Government Business Case Development Framework and the Infrastructure Australia Assessment Framework. Sensitivity scenarios run at 4% and 10% as identified by Infrastructure Australia.

3 Base Case and project options

The base case and package options were defined in collaboration with LGAQ and WBBROC LGA representatives. The package options address the following waste streams and recovery measures, to different levels (low, medium and high intervention):

- Organics education, collection, and resource recovery
- Recycling education, collection, and resource recovery
- Residual waste disposal and resource recovery.

This chapter defines the base case and options packages, and includes:

- Base Case
- Solution descriptions
- Options.

3.1 Base Case

The base case is defined as the continued resource recovery and waste management scenario in the LGAs in WBB. It represents the 'do minimum' approach, where the majority of the waste generated across the WBB is transported to local landfills or the regional Material Recovery Facilities (MRF) located in Cherbourg, Hervey Bay and Bundaberg, without significant capital investment in alternative solutions or major operational changes.

The Bundaberg, Fraser Coast, Gympie, and South Burnett Regional Councils, and Cherbourg Aboriginal Shire Council provide fortnightly recycling collections services, offering a two-bin service of residual waste and recycling.[7] The North Burnett Regional Council offer a weekly single-bin residual waste service.

The landfill capacity assessment undertaken in the Queensland Waste and Resource Recovery Infrastructure Report highlights that within the WBB region, existing approved regional landfill capacity will start to approach exhaustion by approximately 2030 in a low recovery scenario.

The landfill capacities and expected exhaustion years are presented in Table 2.

Table 2: WBB LGA landfill capacity

Council	Landfill	Annual disposal (20-21, tonnes)	Current approved capacity (tonnes)	Expected exhaustion of capacity
Bundaberg Regional Council	Bundaberg Waste Management Facility	11,880	600,000	25 years
Bundaberg Regional Council	Bundaberg Regional Waste Management Facility	84,236	1,700,000	35 years
Bundaberg Regional Council	Childers Waste Management Facility	1,563	11,000	Imminent conversion to transfer station

[7] Arcadis (2019). Queensland Waste and Resource Recovery Infrastructure Report. Accessed at https://www.qld.gov.au/__data/assets/pdf_file/0034/199249/qld-waste-resource-recovery-infrastructure-report.pdf

Council	Landfill	Annual disposal (20-21, tonnes)	Current approved capacity (tonnes)	Expected exhaustion of capacity
Bundaberg Regional Council	Qunaba Waste Management Facility	9,862	315,000	10 years
Bundaberg Regional Council	Tirroan Waste Management Facility	588	5,000	Imminent conversion to transfer station
Cherbourg Aboriginal Shire Council	Cherbourg Rubbish Tip	650	9,845	2030
Fraser Coast Regional Council	Maryborough Landfill	77,709	3,767,000	2052
Gympie Regional Council	Gympie Waste Management Facility	31,836	180,000	2028
North Burnett Regional Council	Biggenden Waste Management Facility	0	8,177	2025
North Burnett Regional Council	Eidsvold Waste Management Facility	0	518	2025
North Burnett Regional Council	Gayndah Waste Management Facility	0	8,221	2030
North Burnett Regional Council	Monto Waste Management Facility	0	14,861	2050
North Burnett Regional Council	Mt Perry Waste Management Facility	*0*	*0*	*2020*
North Burnett Regional Council	Munduberra Waste Management Facility	0	28,066	2200
South Burnett Regional Council	Kingaroy Waste Facility	35,091	158,543	2029
South Burnett Regional Council	Kumbia Waste Facility	0	TBC	2051
South Burnett Regional Council	Murgon Waste Facility	0	10,920	2031
South Burnett Regional Council	Nanango Waste Facility	0	39,338	2031
South Burnett Regional Council	Wondai Waste Facility	0	19,087	2030

The base case includes regulations set out in the following legislations:

- *Waste Reduction and Recycling Act 2008*
- *Environmental Protection Act 1994*
- *Local Government Act 2009.*

The following legislation act on initiatives in the following strategies and policies:

- Queensland Waste Management and Resource Recovery Strategy (2019)
- Queensland Resource Recovery Industries 10-Year Roadmap and Action Plan (2019)
- Wide Bay Burnett Waste Management & Resource Recovery Strategy 2015-2020
- Bundaberg Regional Council Waste Management & Resource Recovery Strategy 2017-2025
- North Burnett Regional Council Waste Reduction & Recycling Plan 2021-2026
- South Burnett Regional Council Waste Management Strategy 2015-2022
- Gympie Regional Council – Regional Waste Management Strategy 2013-2020
- Fraser Coast Waste Strategy 2019-2029
- Waste disposal levy
- Queensland Energy from Waste Policy (2021)
- Queensland Organics Strategy and Action Plan 2022-2032
- Queensland Plastic Pollution Reduction Plan
- Single-use plastic items ban
- Plastic bag ban
- Containers for Change - container refund scheme.[8]

The base case also includes committed and funded waste projects which are subject to further analysis.

3.2 Solution descriptions

There are several solutions implemented as part of each package to enable resource recovery. These solutions are described in Table 3. Detail on which solutions are included in each package is provided in Section 3.3. Some solutions detailed in Section 3.3 are considered in sensitivity testing.

Table 3: Description of solutions

Category	Solution	Description
Organics	Food Organics and Garden Organics (FOGO) to open windrow composting including collection.	Councils provide FOGO bin to residents and implement FOGO kerbside collection for residential and commercial waste (in addition to self-haul green waste). This waste is transported to open windrow composting facilities (either in-region or a regional facility). Waste is processed in an open air environmental where the materials break down in the presence of oxygen into compost or other soil improver products that can be sold into landscaping and agricultural markets. It is noted that there remains uncertainty related to the Queensland Government requirements associated with FOGO processing and requirements to process this stream within a more expensive enclosed system but likely this will be determined on a case-by-case basis depending on risk assessment. For the purpose of this assessment, it is assumed that an outdoor composting site can be located in an area where risks can be managed satisfactorily for the regulator.
	FOGO to anaerobic digestion (AD) including	Councils provide FOGO bin to residents and implement FOGO kerbside collection for residential and commercial waste (in addition to self-haul). This waste is transported to a dry AD facility and processed into biogas and digestate. AD decomposes FOGO waste by anaerobic bacteria in the absence of oxygen (usually in a sealed tank). Biogas and digestate are collected, and secondary

[8] This analysis does not account for the upcoming introduction (pending approval) from the State to include wine bottles and spirit bottles.

Category	Solution	Description
	collection.	products can be sold and reused.
Kerbside recycling	Commingled kerbside (BAU or amended services)	Councils continue BAU commingled kerbside collection. Recovered recyclables are transported to a regional MRF either direct or via transfer stations for sorting and processing. Paper and cardboard, glass, plastics, and metals can be sent from the facility for reprocessing. The Bundaberg Regional Council owned and private sector operated MRF in Hervey Bay currently performs this function as well as the Cherbourg Aboriginal Shire Council owned and operated MRF. This option assumes existing MRF contracts are either extended or a new regional MRF contract is agreed as contracts expire.
Residual (including feedstock location)	Landfill	Councils invest in additional landfill capacity as required. This could be the addition of new landfill cells within existing facilities, or the construction of new landfills. Landfills could be at a Council scale, or collaboratively deliver a regional landfill servicing all Councils in the region.
	Energy from Waste (EfW)/ Alternate Waste Treatment (AWT) Feedstock location (from within region)	Waste is sent out of region to an EfW/AWT facility. Residual waste generated within the region is provided as a feedstock. Energy recovery process is via incineration or thermal treatment. Energy is recovered from waste through a steam boiler and turbine as electricity, while heat, in the form of steam or hot water, may also be captured. Secondary materials are sold for reuse. EfW residual is disposed of in landfill. Recovery of incinerator bottom ash (IBA) may be a critical factor in the financial viability of an incinerator as 20% of input becomes bottom ash. Potential for this material to be used under an end-of-waste code once developed to avoid landfill cost,
Processing capacity	Local beneficiation (e.g., glass, tyres, etc)	A local beneficiation operation is established to process recyclable materials that are either sorted at the MRF or self-hauled to transfer stations by residents (non-council managed waste). Local beneficiation could be established at the MRF to reduce transportation costs. It is anticipated for this option that private industry would provide the solution (i.e., facilities to process and convert recyclate into feedstock for manufacturing) however Councils may play an important role in facilitation and providing feedstock to these facilities, which in turn will help progress regional resource recovery rates.

3.3 Options

Nine options packages were assessed at the multi-criteria assessment (MCA) workshop. Packages were assessed against their ability to meet the objectives of the project, using criteria including:

- Waste diversion and resource recovery
- Environmental impact
- Downstream economic impact
- Cost
- Community impact.

The packages are displayed in Figure 1.

Package	Package 1	Package 2	Package 3	Package 4	Package 5	Package 6	Package 6a	Package 7	Package 7a
Intervention level	**Minimum intervention**	**Low intervention**	**Medium intervention A**	**Medium intervention B**	**Medium intervention C**	**High intervention A**	**High intervention A**	**High intervention B**	**High intervention B**
Organics solution	-	FOGO to composting incl collection	FOGO organics to AD incl collection	FOGO to composting incl collection	FOGO to composting incl collection	FOGO to composting incl collection	FOGO to composting incl collection	FOGO to composting incl collection	FOGO to composting incl collection
Kerbside recycling solution	BAU commingled	BAU commingled	BAU commingled	commingled kerbside (new or additional services)	commingled kerbside (new or additional services)	commingled kerbside (new or additional services)	commingled kerbside (new or additional services)	commingled kerbside (new or additional services)	commingled kerbside (new or additional services)
Residual waste solution	Landfill	Landfill	Landfill	Landfill	Landfill	Landfill + EfW/AWT/PEF/ RDF (regional)	Landfill + send residual waste of out region	Landfill + EfW/AWT/PEF/ RDF (regional)	Landfill + send residual waste out of region
Feedstock location	In region	FOGO sourced from in or out of region	FOGO sourced from in or out of region	FOGO sourced from in or out of region	FOGO sourced from in or out of region	FOGO sourced from in or out of region	FOGO sourced from inr or out of region	FOGO sourced from in or out of region	FOGO sourced from in or out of region
Processing capacity	Out of region	Out of region	Out of region	Out of region	Beneficiation locally e.g. glass, agricultural plastics, tyres, solar panels etc.	Out of region	Out of region	Beneficiation locally e.g. glass, agricultural plastics, tyres, solar panels etc.	Beneficiation locally e.g. glass, agricultural plastics, tyres, solar panels etc.

Figure 1: Options packages

The three packages that scored the highest (illustrated above) were assessed in the economic appraisal and are:

- Package 2 - Low intervention
- Package 5 - Medium intervention C
- Package 6a – High intervention A
- Package 7a - High intervention B.

It is important to note that each Council is different in geographic area, population, resource recovery capability and local economic drivers. The proposed packages are regional solutions, however, are not ‘one size fits all’. In addition to the proposed regional solutions, Councils can:

- Maintain existing service and other non-red bin activities such as self-haul etc.
- Opt-in (or -out) of proposed solutions for certain waste streams if it is not commercially feasible/viable, in favour of a more local solution
- Collaborate as a region on problem solving (e.g., disaster waste, problem wastes)
- Deliver regional education campaigns to improve community understanding and behaviour
- Provide feedstock to regional facilities, such as the regional MRF
- Collaborate for transport solutions or hub and spoke style models
- Participate in regional solutions in the future once sufficient capacity/demand is achieved locally
- Investigate opportunities to work with industry to facilitate or support non-council managed waste for example, tyres, plastic and glass.

The analysis is predicated on a number of assumptions, including:

- For each package, it is assumed that the waste infrastructure (e.g., FOGO processing and beneficiation facilities) is located at an appropriate location in the Bundaberg LGA (to be determined in the future) near the MRF, to estimate required transport costs. It is assumed that some waste will be transported outside of the WBB region to an EfW facility in South East Queensland (SEQ).
- The package descriptions below are incremental to ‘business as usual’ waste management and resource recovery practices.

3.3.1 Package 2 – low intervention B

As a low intervention option, Package 2 involves the introduction of kerbside FOGO collection, transported to a processing facility for composting. All other waste streams are managed as per the base case. It is noted that South Burnett Regional Council commenced a kerbside recycling collection in early 2023 which is captured as an expansion in the waste forecasting model and included under Package 2. The package and its components are outlined in Table 4.

Table 4: Package 2 implementation (commencing operations)

	Bundaberg	Cherbourg	Fraser Coast	Gympie	North Burnett	South Burnett
Kerbside FOGO collection	2027	-	2027	-	-	-
FOGO education	2026	-	2026	-	-	-
Kerbside recycling collection (expansion)	-	-	-	-	-	2023

3.3.2 Package 5 – medium intervention C

As a medium intervention option, Package 5 incorporates the Package 2 FOGO solution, an improved recycling collection, as well as local beneficiation of collected recyclables (plastic and glass) while paper and cardboards are sent out of region for beneficiation. The package and its components are outlined in Table 5.

Table 5: Package 5 implementation (commencing operations)

	Bundaberg	Cherbourg	Fraser Coast	Gympie	North Burnett	South Burnett
Kerbside FOGO collection	2027	-	2027	-	-	-
FOGO education	2026	-	2026	-	-	-
Kerbside recycling collection (expansion)	-	-	-	-	-	2023
Recycling education	2025	2025	2025	2025	2025	2025
Glass beneficiation	2025	2025	2025	2025	2025	2025
Plastics beneficiation	2028	2028	2028	2028	2028	2028

3.3.3 Package 6a – high intervention A

As a high intervention option, Package 6a incorporates the Package 2 FOGO solution, an improved recycling collection (i.e., expanding service offering with the exception of North Burnett Regional Council), as well as recycling education, however, does not include local beneficiation. It also incorporates transporting a portion of residual waste outside of the region to an EfW facility assumed to be in SEQ. The package and its components are outlined in Table 6.

Table 6: Package 6a implementation (commencing operations)

	Bundaberg	Cherbourg	Fraser Coast	Gympie	North Burnett	South Burnett
Kerbside FOGO collection	2027	-	2027	-	-	-
FOGO education	2026	-	2026	-	-	-
Kerbside recycling collection (expansion)	2026	2026	2026	2026	-	2023

	Bundaberg	Cherbourg	Fraser Coast	Gympie	North Burnett	South Burnett
Recycling education	2025	2025	2025	2025	2025	2023
Residual waste solution	2036	-	2036	-	-	-

3.3.4 Package 7a – high intervention B

As the highest intervention option, this package provides a solution for all headline waste streams. It incorporates transporting residual waste outside of the region to an EfW facility in SEQ, in addition to the FOGO and kerbside recycling solutions and local beneficiation included in Package 5. The package and its components are outlined in Table 7.

Table 7: Package 7a implementation (commencing operations)

	Bundaberg	Cherbourg	Fraser Coast	Gympie	North Burnett	South Burnett
Kerbside FOGO collection	2027	-	2027		-	-
FOGO education	2026	-	2026	-	-	-
Kerbside recycling collection (expansion)	2026	2026	2026	2026		2023
Recycling education	2025	2025	2025	2025	2025	2023
Glass beneficiation	2025	2025	2025	2025	2025	2023
Plastics beneficiation	2028	2028	2028	2028	2028	2028
Residual waste solution	2036	-	2036	-	-	-

4 Costs

The costs of the packages that form part of the economic analysis include capital, lifecycle and operating costs of new infrastructure as well as education costs, transport and collection costs.

4.1 Capital expenditure

Owing to the preliminary nature of the analysis, assumptions have been made regarding the technology, scale and location of resource recovery facilities and requirements in WBB. Sensitivity testing will utilise different technologies to understand how this effects the economic analysis.

The estimated capital costs (CAPEX) for the facilities were provided by SLR, using industry benchmarks, information from Councils, and supplemented with desktop research. Detailed cost estimates were not undertaken for the analysis and the costs do not include land acquisition or site preparation. A description of key cost inclusions in the core scenario is presented in Table 8.

Table 8: Capital cost inclusions

Capital cost item	Description
FOGO facility	Organic waste (kerbside and self-hauled) will be collected from Councils across WBB and transported to a regional facility to be processed. Location: Bundaberg LGA Technology: Open windrow composting Scale: 60,000 tonnes per annum (tpa)
Transfer/bulking station infrastructure Dedicated household hazardous waste transfer facilities	New transfer stations/bulking stations/dedicated household hazardous waste transfer facilities may be required to sort waste in each Council area prior to be transported to the regional facilities. Allowance has been made for one station per Council (i.e., six stations). Location: All LGAs - exact location within LGA not specified. Technology: Surface infrastructure amendments to provide new pads, storage locations, access roads and other enabling infrastructure. Cost estimates for these sites may vary depending on existing infrastructure, scale, complexity (i.e., if developed on landfill or new site) as well as specific mobile or fixed plant required. Scale: 10,000 tpa at each station
Bin provision	New kerbside organics and recycling services will require provision of bins to households. Provision for collection vehicles has not been included as the procurement and operating model for these new services is unknown (i.e. it has been assumed these are incorporated as part of a contracted bin lift cost (detailed in the operating costs)). This also does not include re-lidding of bins in response to national harmonisation recommendations. Location: Councils introducing kerbside FOGO collection and/or expanding kerbside recycling collection Inclusions: 240L GO bin, FO kitchen caddy, 240L recycling bin
Beneficiation facilities	Local beneficiation facilities have been assumed to include: • Glass processing • Plastics processing. For the purpose of this analysis, it is assumed that the local facilities are located in the Bundaberg LGA.

Capital cost item	Description
	Paper processing is assumed to be done in SEQ.
Lifecycle costs	Lifecycle costs represent the cost of owning and maintaining a facility. The lifecycle costs have been estimated at 2.5% of CAPEX annually.

A summary of the capital costs is presented in Table 9.

Table 9: Capital costs ($2023, real, millions)

Component	Package 2	Package 5	Package 6a	Package 7a
FOGO facility	-	-	-	-
Transfer/bulking station	-	7.50	7.50	7.50
Hazardous waste transfer facility	-	1.20	1.20	1.20
Bin provision (for new services)	3.60	3.99	3.99	3.99
Glass beneficiation facility	-	5.70	-	5.70
Plastics beneficiation facility	-	10.00	-	10.00
Total CAPEX	**3.60**	**29.59**	**13.89**	**29.59**

4.2 Operational Expenditure

The estimated operating costs (OPEX) for the facilities were provided by SLR, using industry benchmarks, information from Councils, and supplemented with desktop research. Detailed operating cost estimates were not undertaken for the analysis. Table 10 presents the operating costs over the life of the project. As discussed in Section 3.3, all OPEX costs are incremental to BAU. Note that beneficiation facility capital and operating costs are included for the purposes of the economic assessment, however, it is assumed these may be delivered by the private sector and therefore, costs are not incorporated into the cost to Councils/households discussed in Section 6.3.

Table 10: Operating costs ($2023, real, millions)

Component	Package 2	Package 5	Package 6a	Package 7a
FOGO*	296.66	296.66	296.66	296.66
Transfer/bulking station	-	1.61	2.50	2.50
MRF	-	47.96	48.07	48.07
Bin collection costs (new services)	94.71	110.51	110.51	110.51
FOGO education	19.37	19.37	19.37	19.37
Recycling education	-	30.49	30.49	30.49
Transport costs	35.61	40.94	65.07	63.66
EfW gate fee**	-	-	152.40	145.09

Component	Package 2	Package 5	Package 6a	Package 7a
Glass beneficiation facility	-	45.50	-	45.50
Plastics beneficiation facility	-	39.00	-	39.00
Total OPEX	**446.35**	**632.05**	**725.07**	**800.85**

**It is assumed that a third party will develop and operate the FOGO facility. The operating cost represents the $110/tonne gate fee incurred by participating Councils to send collected FOGO waste for composting (open windrow).*
*** For Package 6a and 7a, residual waste is sent out of region to an EfW facility in SEQ. This cost represents the $225/tonne gate fee incurred by participating Councils to send collected residual waste for processing. It is assumed 80% of residual waste from Bundaberg and Fraser Coast is sent to EfW.*

Additional detail on the methodology for different components of OPEX is presented in the sections below.

4.2.1 Infrastructure costs

The proposed packages include the ongoing operation of resource recovery infrastructure in WBB. The inputs used to quantify the operating costs of these facilities are displayed in Table 11.

Table 11: Infrastructure operating cost input assumptions

Infrastructure	Input	Assumption
FOGO gate fee	$110/tonne	SLR benchmarking
Transfer/bulking station	$60/tonne 10,000tpa facility (each station)	Using annual waste projections for self-haul recyclables provided by Arcadis and extrapolated to 2053
MRF	$170/tonne 10,000 - 25,000tpa facility	Using annual waste projections for recyclables provided by Arcadis and extrapolated to 2053 MRF operation costs only calculated based on new recycling volumes above BAU (resulting from education and expanded collection)
Beneficiation facilities	Glass: $1.75 million p.a Paper: $0.35 million p.a Plastic: $1.5 million p.a	Using annual waste projections for recovered recyclable products and extrapolated to 2053 *Provided by Arcadis*
EfW gate fee	$225/tonne	SLR benchmarking and input from LGAs

4.2.2 Bin collection costs

The proposed packages include the introduction or expansion of kerbside FOGO and/or recycling services. The inputs used to quantify costs are displayed in Table 12.

Table 12: Collection cost inputs

Component	Input	Assumption
Kerbside bin provision	FOGO service: Bundaberg and Fraser Coast	Based on defined options and waste flow data

Component	Input	Assumption
	Recycling service: Expansion of services for Bundaberg, Fraser Coast, and Gympie. Implementation of service in South Burnett	
Kerbside collection cost ($/bin lift)	Major cities: $1.67 Inner regional: $1.95 Outer regional: $2.72	Inner regional – All councils *Provided by Arcadis*
Households (new/additional)*	FOGO service (weekly): • Bundaberg: 32,565 households • Fraser Coast: 36,623 households Recycling service (fortnightly): • South Burnett: 11,540 households	Number of new household collection services to match current kerbside MSW collection coverage in each LGA. Number of new household collection services to match current service coverage of kerbside recycling collection.

** For the basis of modelling, we have assumed 80% of households receiving residential waste collection services will receive a new FOGO service across all LGAs. It is noted that as Councils progress with their own more detailed business cases, the number of new/additional households may vary.*

4.2.3 Education costs

The proposed packages include provision for education regarding the introduction of organics and expanded recycling collections to households that do not already offer this service. The inputs used to quantify costs are displayed in Table 13.

Table 13: Education cost input assumptions

	Input	Assumption
Ongoing collection support – weekly collection (FOGO)	$8.00/household All LGAs introducing a FOGO service	Cost per household to deliver education campaigns and initiatives for a change in kerbside collection and general education regarding source separation.
Ongoing collection support – including fortnightly collection (commingled recycling), food waste avoidance and other waste education needs.	$8.00/household All LGAs	Cost per household to deliver education campaigns and initiatives for reduced contamination, food waste avoidance and general education regarding source separation on top of BAU (BAU assumed to be $4/hh).

4.2.4 Transport costs

Transporting recovered materials to be reprocessed will result in an increase in transport costs, measured through increased kilometres travelled from LGAs to the regional processing facilities. The transport costs for the collection routes have not been calculated. Transport modelling was not undertaken for this analysis therefore transport costs were calculated using standard national methodology. A summary of the annual transport costs is displayed in Table 14.

Table 14: Annual transport costs ($2023, real)

Component	Input	Assumption
Bulk transport cost by road	$0.147/tonne/km	Source: SLR

Component	Input	Assumption
Kilometres travelled to Bundaberg FOGO facility	From Cherbourg Rubbish Tip, Cherbourg: 197km From Maryborough Landfill, Fraser Coast: 95km From Gympie Waste Management Facility, Gympie: 175km From Kingaroy Waste Facility, North Burnett: 232km From Kingaroy Waste Facility, South Burnett: 232km	Assumed start location is existing landfill in each LGA and location of regional facility is assumed to be proximate to Bundaberg Regional Landfill. Bundaberg assumed as a central point to inform this analysis, and the actual location will depend on a Detailed Business Case.
Kilometres travelled to Hervey Bay MRF (Fraser Coast)	From Gympie Waste Management Facility, Gympie: 89km	Assumed that Fraser Coast and Gympie LGAs transport waste to existing Hervey Bay MRF
Kilometres travelled to Cherbourg MRF	From Kingaroy Waste Facility, South Burnett: 55km	Assumed that Cherbourg and South Burnett LGAs transport waste to existing Cherbourg MRF
Kilometres travelled to Bundaberg MRF	-	Assumed that Bundaberg LGA transports waste to existing Bundaberg MRF
Kilometres travelled to SEQ EfW facility	From Bundaberg Regional Landfill, Bundaberg: 336km From Maryborough Landfill, Fraser Coast: 255km	Assumed start location is existing landfill in each LGA and regional facility is proximate to SEQ EfW facility

4.3 Summary of costs

A summary of the costs over the life of the project for each option is displayed in Table 15. The costs of the project were calculated over the lifetime of the project with two distinct periods:

- Construction period
- Operational period.

CAPEX is calculated as only occurring in the construction period. OPEX, transport costs, education, and bin collection costs are calculated as only occurring in the operational period.

Table 15: Summary of costs ($2023, millions, real)

Cost	Real	PV
Package 2		
CAPEX	-	-
Lifecycle costs	-	-
OPEX	316.03	105.13
Transport and bin costs	133.92	48.48
Total	**449.95**	**153.61**

Cost	Real	PV
Package 5		
CAPEX	24.40	19.96
Lifecycle costs	16.88	5.92
OPEX	482.62	161.38
Transport and bin costs	156.28	56.46
Total	**680.18**	**243.71**
Package 6a		
CAPEX	8.70	7.60
Lifecycle costs	6.53	2.52
OPEX	551.52	169.37
Transport and bin costs	179.57	61.04
Total	**746.31**	**240.54**
Package 7a		
CAPEX	24.40	19.96
Lifecycle costs	17.16	6.16
OPEX	628.71	195.10
Transport and bin costs	178.28	60.83
Total	**848.54**	**282.04**

5 Benefits

5.1 Overview of benefits

Table 16 provides an overview of the identified benefits and disbenefits in each category, and notes whether they can be monetised for inclusion in the CBA.

Table 16: Overview of benefits

Benefits/disbenefits	Description	Monetised
Benefits		
Reduction in waste to landfill	Value of airspace at landfill as a proxy for deferred investment in expanding landfill	Yes
Increased resource recovery and reuse	Value of beneficiated products (recyclables and FOGO)	Yes
Energy and environmental benefits	Value of carbon saved from redirecting residual waste to EfW (rather than remaining in landfill) Value of carbon saved from diversion of FOGO waste to composting (rather than remaining in landfill)	Yes
Avoided cost of levy	Reduced waste to landfill will reduce to ongoing cost of the residual waste levy for Council	No
Reduction in environmental impacts (leachate, landfill, fires etc)	Reduced volumes of waste in landfill owing to higher resource recovery	No
Reduction in illegal dumping	Reduction in illegal dumping as residents have more options for resource recovery and disposal	No
Improved waste management practices	Provision of waste management education and additional waste management solutions resulting in improved household and industry practices	No
Increased downstream industry capacity and resulting economic activity in WBB	Manufacturing and processing activity in the region owing to the increase in feedstock available for local beneficiation	No
Better informed community	Resulting from waste management education	No
Increase in local skilled jobs	Increase in jobs in WBB across multiple industries	No
Improved value for money of waste management (environmental, social, economic)	More sustainable waste management will lead to improved long-term outcomes for Council and the community through reduced fees and better environmental outcomes	No
Development of local circular economies for recovered materials	Access to beneficiated materials provides opportunity for development of local circular economies	No
Ability to meet State and Federal targets	Increased diversion rates and use of secondary raw materials with reduced volumes of waste to landfill	No
Disbenefits		
Negative environmental externalities	Increase in transport emissions as a result of a transporting waste	Yes

Benefits/disbenefits	Description	Monetised
Impact to rate payers	Increase in rates for householders due to costs associated with package implementation. This is not monetised as an economic benefit - however a high-level analysis has been undertaken in Section 6.3.	No

5.1.1 Monetisable benefits

Value of airspace at landfill

The implementation of the packages proposed in the Regional Waste Management Plan will incentivise community and industry to improve waste management practices by providing additional solutions for resource recovery through Council and industry led services.

Within each package, there will be an opportunity for the community to increase resource recovery by utilising new household collection services and for industry to reduce waste through the provision of new waste processing facilities. This will reduce the volume of waste deposited at landfill, increasing the available airspace and potentially prolonging the life of the asset. To reflect the value of the saved landfill airspace to the economy, the value of the airspace has been calculated.

Assumptions

The estimated benefit of the value of airspace at landfill relies on a number of industry level benchmarks and assumptions, including:

- Waste volume projections across each LGA have been forecast by Arcadis
- The introduction of FOGO education and composting capability in WBB will incentivise the community in all LGAs to separate waste at the household level, using a new bin collection service that will reduce volumes of organic household waste going to landfill. The analysis assumes capture of Food and Garden Organics in the same FOGO stream rather than individual streams.
- The introduction of an amended recycling collection service (to meet current service coverage of MSW kerbside waste collection) coupled with waste education in WBB will incentivise the community to improve waste separation behaviour at the household level that will reduce volumes of recyclable materials going to landfill
- Transporting waste outside of the WBB region to an EfW facility in SEQ will utilise volumes of residual waste that are unable to be recycled, reducing the volumes of waste going to landfill however, landfill will still be required for residual wastes.
- The value of the benefit can be represented through the value of the gate fees at each landfill. Landfill gate fees typically cover the costs of operation, overheads, mobile plant and equipment, labour depreciation costs of roads and building and other fixed assets and profit.[9] It is assumed that the gate fees also account for future post-closure management, rehabilitation and long-term monitoring and replacement of the asset.

Table 17 lists the assumptions used to calculate the total landfill airspace benefit to Councils in WBB.

Table 17: Value of airspace benefit input assumptions

Input	Assumption	Source
Gate fees at landfill ($2023)	Bundaberg: $90.0 Cherbourg: $90.0 Fraser Coast: $90.0	Gate fees based on WBBROC Waste to Energy Feasibility Study 2020. Gate fee ranged from $20-$165, with a median value

[9] MRA Consulting Group (2015). What is air worth? How to price a landfill. Accessed at https://mraconsulting.com.au/what-is-air-worth-appropriately-pricing-landfills/

Input	Assumption	Source
	Gympie: $90.0 North Burnett: $90.0 South Burnett: $90.0	assumed for the assessment.
Waste volumes	Baseline current residual waste volume projections extrapolated to 2053 Forecast residual waste volume projections based on intervention package implemented	Arcadis: WBB WMP Options Model v2.1 Waste projections are based on QWDS data and Council validation and also consider projected population growth and capture rates of waste streams

Approach to monetise

Using these assumptions, the value of landfill airspace has been calculated for each relevant Package. The following equations were used to calculate the avoided cost at each landfill over the appraisal period:

$$Baseline\ residual\ waste\ volumes - projected\ landfill\ volumes\ with\ intervention - = waste\ volume\ diverted\ from\ landfill$$

$$Waste\ volume\ diverted\ from\ landfill * landfill\ gate\ fee = value\ of\ airspace\ saved$$

The results of these calculations for each LGA were summed to calculate the total benefit under each package.

Value of recovered and reprocessed products

Increased collection services and waste education in WBB is expected to result in better waste management practices and subsequent volumes of sorted materials that can be reprocessed for use. The implementation of reprocessing facilities, such as composting or glass/plastic/paper beneficiation plants are able to turn diverted waste volumes into secondary raw products that have value. As such, this benefit represents the avoided cost of making each product from raw materials.

Assumptions

The estimated benefit of the value of reprocessed products relies on a number of industry level benchmarks and assumptions, including:

- The increase in kerbside collection of organic and recyclable materials, as well as improved education regarding resource recovery in WBB will incentivise the community to separate waste and provide enough feedstock for use as secondary raw materials
- Industry will be incentivised to invest in the region and establish reprocessing operations, most likely in a larger LGA such as Bundaberg, close to the location of sorted feedstock
- The value of the benefit can be represented through the value (sale price) of the product after it has been reprocessed
    - It is assumed that paper and cardboard products will be sent to SEQ for beneficiation. No costs or gate fees have been included in this CBA for paper and cardboard products, therefore, the benefit for this material is currently excluded

Input assumptions are presented in Table 18.

Table 18: Value of reprocessed product input assumptions

Input	Assumption	Source
Waste volumes	Forecast volume of materials diverted through improved kerbside collection Forecast residual waste projections based	Arcadis: WBB WMP Options Model v2.1 Waste projections are based on QWDS data and Council validation and also consider projected

Input	Assumption	Source
	on Package implemented	population growth and capture rates of waste streams
Product value	Compost: $30/t Glass sand: $72/t Plastic pellets: $350/t	Compost: Industry benchmarking based on previous projects has indicated a compost sale price of $30 - $120, depending on the quality of the compost. $30 has been used as an average and sensitivity testing will test different prices. Glass: Department of Environment and Energy 2019[10] Plastic: Department of Agriculture 2019[11]
Conversion factor	Compost: 0.5 Glass, plastic: 0.8 Used to determine the loss in material volume after waste has been processed	Industry benchmarking

Approach to monetise

Using these assumptions, the value of landfill airspace has been calculated for each relevant Package. The following equation was used to calculate the avoided cost at each landfill over the appraisal period:

$$Projected\ waste\ volume\ for\ each\ stream * conversion\ factor * \$/tonne = value\ of\ product$$

Environmental benefit

The diversion of residual waste (transported to SEQ EfW facility) and FOGO waste (to composting facility) from landfill generates a carbon saving benefit due to the reduction of greenhouse gases associated with these resource recovery practices.

Assumptions

The estimated benefit of the value of avoided carbon emissions relies on a number of industry level benchmarks and assumptions, including:

- The value of these benefits can be represented through the current price of an Australian Carbon Credit Unit (ACCU) given that the avoided carbon emissions could be sold as credits.

Table 19: Value of energy and environmental benefit input assumptions

Input	Assumption	Source
Waste volumes	Forecast residual waste projections based on the Package implemented, and extrapolated to 2053 Forecast FOGO diverted waste projects based on the Package implemented, and extrapolated to 2053	Arcadis: WBB WMP Options Model v2.1 Waste projections are based on QWDS data and Council validation and also

[10] Department of the Environment and Energy (2019). Assessment of Australian recycling infrastructure – Glass packaging. Accessed at https://www.agriculture.gov.au/sites/default/files/documents/assessment-australian-recycling-infrastructure-glass-packaging.pdf

[11] Department of Environment and Energy (2019). Recycling market situation: Summary review. Accessed at https://www.dcceew.gov.au/sites/default/files/documents/recycling-market-review-paper.pdf

Input	Assumption	Source
		consider projected population growth and capture rates of waste streams
Value of CO_2-equivalent	FOGO landfill CO_2-e emissions factor: 1.85 FOGO compost CO_2-e emissions factors: CH_4: 0.021 N_2O: 0.025	Landfill emissions factor is the average of emissions factors for food waste and garden waste Australian Department of industry, Science, Energy and Resources: National Greenhouse Accounts Factors. 2021
Carbon savings EfW	Carbon savings per tonne if EfW replaces landfill = 600kg	The Role of Waste-to-Energy in the EU's long term greenhouse gas emissions reduction strategy[12]
Price of carbon	ACCU = $31.00/t of carbon	Clean Energy Regulator[13]

Approach to monetise

Using these assumptions, the value of avoided carbon emissions has been calculated for each relevant benefit and Package. The following equations were used to calculate the value of carbon emissions saved over the appraisal period:

EfW facility:

$$Volume\ of\ residual\ waste * savings\ factor = tonnes\ of\ waste\ removed$$

$$Tonnes\ of\ waste\ removed * price\ of\ carbon = total\ carbon\ savings\ from\ transition\ to\ EfW$$

Compost facility:

$$(Volume\ of\ diverted\ FOGO * landfill\ CO_2\text{-}e\ emissions\ factor) - (Volume\ of\ diverted\ FOGO * compost\ CO_2\text{-}e\ emissions\ factor) = CO_2\text{-}e\ saved\ from\ FOGO\ composting$$

$$CO_2\text{-}e\ saved\ from\ FOGO\ composting * price\ of\ carbon = total\ carbon\ savings\ from\ FOGO\ composting$$

The cost of emissions associated with transporting waste to the compositing and EfW facilities is captured in the environmental externality disbenefit, outlined in Section 5.1.2, and is therefore not factored into this benefit's monetisation.

5.1.2 Monetisable disbenefits

Environmental externalities

Changes to the pattern and distance of travel by freight vehicles results in reduced urban amenity and increased costs to the environment by increasing the total distance travelled for waste transportation. Table 20 displays the assumptions used to calculate the environmental disbenefit.

[12] The Role of Waste-to-Energy in the EU's long term greenhouse gas emissions reduction strategy. Accessed at https://www.vivis.de/wp-content/uploads/WM8/2018_wm_025-036_clerens

[13] Australian carbon credit units (ACCUs). Accessed at https://www.cleanenergyregulator.gov.au/Infohub/Markets/Pages/qcmr/september-quarter-2022/Australian-carbon-credit-units-(ACCUs).aspx

Table 20: Environmental externalities input assumptions

Input	Assumption		Source
Environmental impacts	**Environmental impact ($2021)**	**$/1000 tkm**	*Australian Transport Assessment and Planning Guidelines PV5*, 2021[14]
	Air pollution	0.57	
	Climate change	3.53	
	Well-to-tank emissions	1.06	
	Noise	0.08	
	Soil and water	0.98	
	Nature and landscape	3.31	
	Urban effects	0	
	Biodiversity	2.86	
	Total	**$12.39/1000 tkm**	
Waste volumes	Forecast volume of organics and recyclable materials diverted through improved kerbside collection and self-haul volumes		Arcadis: WBB WMP Options Model v2.1 Waste projections are based on QWDS data and Council validation and also consider projected population growth and capture rates of waste streams
Kilometres travelled to Bundaberg FOGO facility	From Cherbourg Rubbish Tip, Cherbourg: 197km From Maryborough Landfill, Fraser Coast: 95km From Gympie Waste Management Facility, Gympie: 175km From Kingaroy Waste Facility, North Burnett: 232km From Kingaroy Waste Facility, South Burnett: 232km*		Assumed start location is existing landfill in each LGA and location of regional is proximate to Bundaberg Regional Landfill. Bundaberg assumed as a central point to inform this analysis, actual location will depend on a Detailed Business Case.
Kilometres travelled to Bundaberg MRF	Assumed that Bundaberg LGA transport waste to existing Bundaberg MRF		Assumed that Bundaberg LGA transport waste to existing Bundaberg MRF
Kilometres travelled to Hervey Bay MRF (Fraser Coast)	From Gympie Waste Management Facility, Gympie: 89km		Assumed that Fraser Coast and Gympie LGAs transport waste to existing Hervey Bay MRF
Kilometres travelled to Cherbourg MRF	From Kingaroy Waste Facility, South Burnett: 55km		Assumed that Cherbourg and South Burnett LGAs transport waste to existing Cherbourg MRF
Kilometres travelled to SEQ EfW facility	From Bundaberg Regional Landfill, Bundaberg: 336km From Maryborough Landfill, Fraser Coast: 255km		Assumed start location is existing landfill in each LGA and regional facility is proximate to SEQ EfW facility

Approach to monetise

Using these assumptions, the value of transport emissions has been calculated for each package.

[14] Australian Transport Assessment and Planning Guidelines (2021). PV5 Environmental parameter values. Accessed at https://www.atap.gov.au/sites/default/files/documents/pv5-multi-modal-update.pdf

The following equations were used to calculate the annual transport emissions over the appraisal period:

$$Volumes\ of\ waste * kilometres\ traveled * \$tkm = \ environmental\ impact$$

5.1.3 Non-monetisable benefits

New upstream and downstream economic activity attracted to the region

Development of new waste sorting and processing infrastructure in WBB will provide economic stimulus to the regions where infrastructure is developed, as well as Queensland more broadly. Increasing resource recovery services available in WBB will require increased inputs throughout the supply chain, which may encourage businesses to establish in WBB to be closer to the market.

New upstream and downstream industrial activity in WBB will increase the resilience of the region through increased diversity of services and will decrease reliance on suppliers based elsewhere. This will improve efficiency for business and industry within WBB, potentially reduce logistics costs and further stimulate job growth in WBB.

Increased Gross Regional Product (GRP)

The whole of the WBB is expected to benefit from improving waste management and the development of new waste industries due to increased GRP. GRP is a measurement of the total final value of goods produced in a region. WBB is a major contributor to the state and national economy, generating $14.2 billion in GRP in 2021. The investment in resource recovery infrastructure and associated downstream industry activity is expected to support an increase in GRP, through stimulating the demand for resource recovery services and encouraging private investment in the region.

An increase in resource recovery services may provide better offerings for businesses and greater diversity in waste management options. This may increase the attractiveness of WBB to private investors, however, the impact on the cost of resource recovery may be a deterrent for some investors.

Increased jobs

Investment in resource recovery infrastructure across WBB is expected to create direct jobs as well as indirect jobs in upstream and downstream industries during construction and operations. Industries that will be positively impacted include:

- Waste management: there may be an increase in jobs across the waste industry in waste management and resource recovery services, compliance and enforcement, data analysis and monitoring, waste collection, infrastructure operations and maintenance across the public and private sector.
- Materials production/manufacturing: increased volumes of secondary raw materials may lead to an increase in demand for recycled materials and inputs in the supply chain from businesses that are seeking to increase sustainability of their operations. The input materials can be sourced locally from newly established and expanded businesses within WBB, requiring an increase in production and manufacturing jobs in the region to cater for the increased demand of such goods.
- Logistics: indirectly, the project will increase jobs in transport and logistics companies as waste services and transportation requirements are expanded across WBB.

Meeting Queensland resource recovery targets

Most LGAs within WBB have set targets to work towards a circular economy and reduce waste disposal in landfills. The WBB recovery rates are reported in the Queensland Waste and Resource Recovery Infrastructure Report as approximately 60% for MSW – outperforming the state average of 32%, 47% for C&I – in line with the state average of 47%, and 38% for C&D – below the state average of 51%. To reach and maintain State targets, upgrades to infrastructure, policy and initiatives are required at both an individual Council and regional level. Organics processing in the region is also limited to mulching at Council landfills. Currently, the region has a two MRFs, one in Cherbourg and one in Bundaberg which may be insufficient to process all current and emerging waste streams efficiently and may require further refurbishing and upgrades in the medium term. Without a fundamental shift in policy or investment in infrastructure, State and Federal targets will not be met.

6 CBA results

This section consolidates the costs and benefits to present the headline BCR and economic NPV.

6.1 Summary of costs and benefits

Table 21 summarises the total discounted incremental costs and benefits for the Project, based on the estimation of project benefits and costs relative to the base case. Incremental costs are dominated by capital expenditures. The incremental benefits are dominated by the value of landfill airspace.

Table 21: CBA summary ($2023, millions, discounted at 7%)

Expenditure item	Package 2	Package 5	Package 6a	Package 7a
Costs				
CAPEX	0.00	19.96	7.60	19.96
Lifecycle costs	0.00	5.92	2.52	6.16
OPEX	105.13	161.38	169.37	195.10
Transport and collection costs	48.48	56.46	61.04	60.83
Total costs	**153.61**	**243.71**	**240.54**	**282.04**
Benefits				
Value of airspace at landfill	17.73	26.60	43.36	44.21
Value of compost	-	14.81	14.81	14.81
Value of carbon savings (FOGO)	10.26	10.26	10.26	10.26
Value of beneficiated glass	-	4.59	-	4.59
Value of beneficiated plastics	-	10.19	-	10.19
Value of energy and carbon savings (EfW)	-	-	2.89	2.76
Environmental disbenefit	-0.16	-0.35	-0.74	-0.88
Total Benefits	**27.83**	**66.11**	**70.59**	**85.93**
NPV	**-125.78**	**-177.60**	**-169.95**	**-196.11**
BCR	**0.18**	**0.27**	**0.29**	**0.30**

Figure 2 displays the resulting residual waste from each package, compared to the residual waste under a business-as-usual scenario. The increasing waste volumes are a result of increasing population growth in the region.

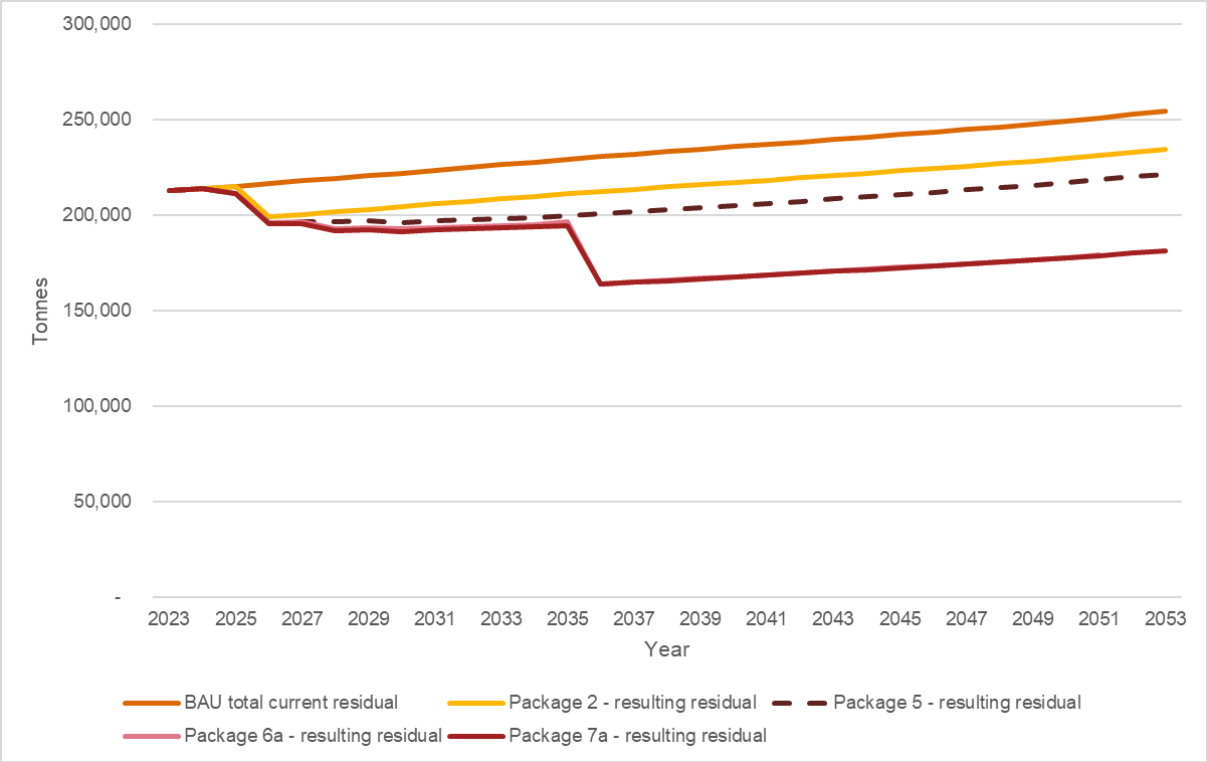

Figure 2: Residual waste from package implementation

The economic analysis results indicate that Package 5, Package 6a and Package 7a perform similarly based on the BCR metric. While Package 6a and 7a divert more waste from landfill, the benefits are outweighed by the greater costs associated with transporting residual waste out of region to the SEQ EfW facility. Package 5 has lower costs but diverts less waste from landfill given residual waste is not sent out of the region to the SEQ EfW facility. Package 2 has the lowest NPV and BCR owing to the costs associated with transport and collection and operating expenses, while the package experiences lower benefits due to no local beneficiation, compost value, or energy and carbon savings.

While the economic analysis reports negative NPVs and BCRs lower than one, this does not mean the project is not economically viable. The assessment has been undertaken from a regional perspective, assuming that Councils are involved in each component where viable. However, as discussed in Section 3.3, there is scope for Councils to 'opt in or out' of some components of the packages. This would reduce/increase capital costs, costs for transfer/bulking infrastructure, collection and transport costs, as well as operating costs where they are dependent on throughput, as well as influence overall waste diversion from landfill. It is recommended that further analysis is undertaken by Councils with detailed cost estimates of infrastructure as this is a key driver of economic viability.

6.1.1 No beneficiation scenario

It is likely the local beneficiation will be undertaken by the private sector and as such, a scenario assessment was undertaken to exclude the costs and benefits of local beneficiation, to understand the effect that this component has on the economic results.

Noting beneficiation is not included in Package 2 or Package 6a in the core scenario, the headline economic results excluding beneficiation are presented in Table 22.

Table 22: No beneficiation scenario results ($2023, millions, $PV)

Expenditure item	Package 2	Package 5	Package 6a	Package 7a
Total costs	153.61	200.31	240.54	238.65
Total benefits	27.83	66.11	70.59	85.93
NPV	-125.78	-134.21	-169.95	-152.72
BCR	0.18	0.33	0.29	0.36

6.2 Sensitivity analysis

This section presents a range of sensitivity and scenario analyses applied to the default economic analysis results. Several analyses have been undertaken to assess the responsiveness of the economic modelling results with respect to changes to key parameters and assumptions.

The analysis in this section is focused on specific alternative scenarios for key assumptions, reflecting different outcomes for Project performance or impact. Table 23 outlines the results from the sensitivity testing undertaken.

Table 23: Sensitivity analysis ($2023, millions, discounted at 7%)

Sensitivity		Package 2	Package 5	Package 6a	Package 7a
Core	**NPV**	**-125.78**	**-176.28**	**-168.56**	**-194.72**
	BCR	**0.18**	**0.27**	**0.30**	**0.31**
4% discount rate	NPV	-190.66	-260.13	-261.22	-295.46
	BCR	0.18	0.28	0.30	0.32
10% discount rate	NPV	-87.64	-128.49	-117.46	-138.38
	BCR	0.18	0.26	0.29	0.29
20% increase in CAPEX	NPV	-125.78	-182.52	-171.70	-201.06
	BCR	0.18	0.27	0.29	0.30
20% decrease in CAPEX	NPV	-125.78	-172.69	-168.21	-191.17
	BCR	0.18	0.28	0.30	0.31
20% increase in OPEX	NPV	-127.15	-184.61	-177.03	-203.19
	BCR	0.18	0.26	0.29	0.30
20% decrease in OPEX	NPV	-124.41	-170.60	-162.87	-189.04
	BCR	0.18	0.28	0.30	0.31
20% increase in transport costs	NPV	-128.51	-180.79	-174.05	-200.17
	BCR	0.18	0.27	0.29	0.30
20% increase in bin collection costs	NPV	-126.33	-178.23	-170.57	-196.74
	BCR	0.18	0.27	0.29	0.30

Sensitivity		Package 2	Package 5	Package 6a	Package 7a
Compost sale price increased to $120	NPV	-125.78	-133.18	-125.53	-151.69
	BCR	0.18	0.45	0.48	0.46

6.3 Effect on households

To understand the impacts on individual stakeholders such as Queensland Government, Local Government or the private sector, a detailed financial and commercial analysis should be undertaken. A financial and commercial assessment would assess the financial viability of the proposed options packages from the viewpoint of the owner of the infrastructure or initiative, such as Councils or the State. It would consider only those cashflows which directly impact the owner. An economic and financial assessment examine different measures of project viability, and neither should be considered in isolation.

For the purpose of this analysis, a high-level assessment of the effect that each package would have on households at a regional level (i.e., not individual Councils) was undertaken using:

- Estimated costs over the appraisal period excluding beneficiation costs (construction + 30 years of operation)
- The expected reduction in levy payment (for each LGA) due to a reduction in residual waste going to landfill based on the package implemented
  - This was calculated based on each LGAs resulting tonnes of residual waste post package implementation, times the annual levy
  - This analysis also took into account the reduction in annual payments from 1 July 2023, as per Table 23, noting that these payments continue to cover the full levy amount (100%) for all LGAs in North Queensland except Townsville over the appraisal period.

The number of serviced households within the coverage area - 108,330

Table 24: Annual payment percentage from 1 July 2023[15]

Financial Year	Bundaberg & Fraser Coast	All other LGAs
2022-23	105%	105%
2023-24	95%	100%
2024-25	85%	100%
2025-26	70%	100%
2026-27	60%	100%
2027-28	50%	100%
2028-29	40%	100%
2029-30	30%	100%

[15] Queensland Government. Waste levy charges from 1 July 2022. https://www.qld.gov.au/environment/management/waste/recovery/disposal-levy/about/from-1-july-2022

Financial Year	Bundaberg & Fraser Coast	All other LGAs
2030-31	20%	100%

Table 25 presents the approximate costs to households in the region over the life of the analysis as well as an approximate annual cost. This cost to household is developed based on the discounted economic costs, with an annuity calculation based across the 30-year appraisal period.

Table 25: Cost to households ($PV, 2023) (non-beneficiation scenario)

	Package 2	Package 5	Package 6a	Package 7a
Total costs over appraisal period ($millions)	153.61	200.31	240.54	238.65
Total levy benefit over appraisal period ($millions)	16.23	21.74	39.40	40.11
Annual cost per household ($/hh)	62.05	80.92	97.17	96.41
Annual levy reduction per household ($/hh)	6.56	8.78	15.92	16.20
Approximate net annual cost per household ($/hh)	55.50	72.14	81.25	80.20

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Appendix D:

Indicative Cost Plan

Table D1 Indicative Cost Estimate (costs in millions, p50 accuracy)

Item	2024	2025	2026	2027	2028	2029	2030	2031	Total to FY31
Regional Implementation									
Project Manager (RWG)	0.25	0.26	0.26	0.27	0.28	0.28	0.29	0.30	2.18
Administrative & Legal	0.10	-	-	-	-	-	-	-	0.10
Develop detailed implementation Plan	0.05	-	-	-	-	-	-	-	0.05
Review RWWP	-	-	-	-	0.10	-	-	-	0.10
Meetings (Council FTE requirement)	0.05	0.05	0.05	0.05	0.05	0.06	0.06	0.06	0.43
Council contribution to actions	0.05	0.05	0.05	0.05	0.05	0.06	0.06	0.06	0.43
Sub Total – Plan Implementation	**0.50**	**0.36**	**0.36**	**0.37**	**0.48**	**0.39**	**0.40**	**0.41**	**3.28**
Regional Education Strategy									
Education Strategy (and updates)	0.05	-	0.02	-	0.02	-	0.02	0.00	0.10
FOGO implementation, BRC/FCRC only	Captured within organic implementation costs below								-
Kerbside Education & Other	Captured within material recycling & recovery costs below								-
Sub-Total – Regional Education	**0.05**	**0.00**	**0.02**	**0.00**	**0.02**	**0.00**	**0.02**	**0.00**	**0.10**
Regional Organics Solution[57]									
FOGO Implementation, BRC only									
Administration, business cases, PM	0.20	0.20	0.08	0.08	0.08	0.08	0.08	0.08	0.88
FOGO education costs (new service BRC)	-	0.26	0.27	0.27	0.28	0.29	0.29	0.30	1.97
One off investment (bins) (BRC)	-	-	-	2.74	-	-	-	-	2.74
Collection costs (new, BRC)	-	-	-	1.71	1.75	1.80	1.84	1.89	8.99
Processing Costs (new, BRC)	-	-	-	1.56	1.60	1.65	1.69	1.75	8.24
FOGO implementation, BRC only	**0.20**	**0.46**	**0.34**	**6.35**	**3.71**	**3.81**	**3.91**	**4.02**	**22.80**
FOGO Implementation, FCRC only									
Administration, business cases, PM	0.20	0.20	0.08	0.08	0.08	0.08	0.08	0.08	0.88
FOGO education costs (new service FCRC)	-	0.29	0.30	0.31	0.32	0.32	0.33	0.34	2.21
One off investment (bins) (FCRC)	-	-	-	3.08	-	-	-	-	3.08
Collection costs (new, FCRC)	-	-	-	1.92	1.97	2.02	2.07	2.12	10.11
Processing Costs (new, FCRC)				1.56	1.61	1.66	1.71	1.77	8.32
FOGO implementation, FCRC only	**0.20**	**0.49**	**0.38**	**6.95**	**3.98**	**4.09**	**4.20**	**4.32**	**24.59**
Organics Programs									
Community composting	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.80
Roll out of compost bin program	-	0.31	-	-	-	-	-	0.31	0.61
Material flow analysis - organics	0.01	0.02	-	-	-	-	0.02	-	0.05
Sub-Total – Organics Programs	**0.11**	**0.43**	**0.10**	**0.10**	**0.10**	**0.10**	**0.12**	**0.41**	**1.46**
TOTAL (Regional Organics Solution)	**0.51**	**1.38**	**0.82**	**13.40**	**7.79**	**8.00**	**8.23**	**8.74**	**48.86**
Material recovery & recycling solution									

[57] Costs for new services presented here do not include benefits (e.g., reduced levy, reduced use of landfill airspace) however these savings are represented in the economic analysis. These costs represent actual costs for implementation. Benefits may not be realised at the same time.

Item	2024	2025	2026	2027	2028	2029	2030	2031	Total to FY31
Education Implementation (kerbside + other)	0.98	1.01	1.03	1.06	1.09	1.11	1.14	1.17	8.59
Education Plan (Cherbourg)	-	0.05	0.02	0.02	0.02	0.02	0.02	0.02	0.18
Small scale infrastructure improvements	-	1.25	1.25	1.25	1.25	1.25	1.25		7.50
Community circular economy programs	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.40
Household Hazardous Waste CRCs	-		0.20	0.20	0.20	0.20	0.20	0.20	1.20
Glass processing & washing plant	-	0.20	7.00	1.00	1.03	1.05	1.08	1.10	12.46
Supplementary funding for Waste Audits	0.08	0.08	0.08	0.09	0.09	0.09	0.09	0.10	0.70
TOTAL (MRR Solution)	**1.11**	**2.64**	**9.64**	**3.67**	**3.72**	**3.78**	**3.83**	**2.64**	**31.03**
Residual Waste									
Progress & implement R&D into problematic wastes	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.80
TOTAL (Residual Solution)	**0.10**	**0.10**	**0.10**	**0.10**	**0.10**	**0.10**	**0.10**	**0.10**	**0.80**
OVERALL TOTAL – IMPLEMENTATION COST FOR RWRRP TO FY30-31	**2.07**	**4.48**	**11.18**	**17.53**	**12.10**	**12.26**	**12.57**	**11.89**	**84.10**

All costs presented in Million $ based at 2023 rates, BRC-Bundaberg Regional Council, CASC-Cherbourg Aboriginal Shire Council, FCRC-Fraser Coast Regional Council, GRC-Gympie Regional Council, NBRC-North Burnett Regional Council. SBRC-South Burnett Regional Council

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