



KYOGLE COUNCIL
3 BIN WASTE AUDIT



North East Waste March 2024



Audit Objectives

To collect data to assess how effectively Council's new 3-bin residential kerbside collection system is working since its introduction in July 2023.

Quantify the aggregated contents of each of the three waste streams (food & garden organics, recycling and residual (landfill) waste) to determine:

- the average quantity generated per household
- if the correct waste material is being placed into the correct bin – level of contamination
- if the size of each bin and frequency of collection is suitable/optimal
- what needs to be improved, to inform future education and engagement initiatives.





Method

In March 2024, a residential kerbside audit was conducted in Kyogle and Woodenbong townships. The audits occurred ~9 months after the roll out of the new 3 bin system (Jul 23) for FOGO, recycling and residual waste and as far as practicable, replicated the audit completed prior to the roll out when a single 240L split bin for residual and recycling was in use.

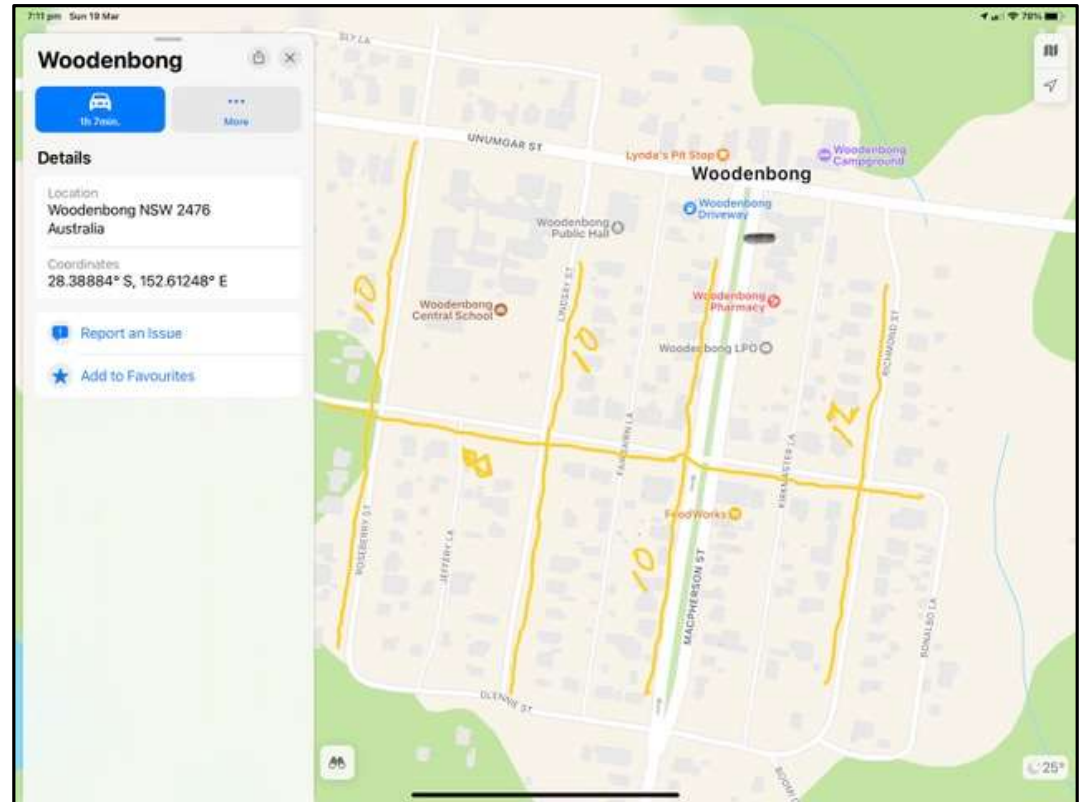
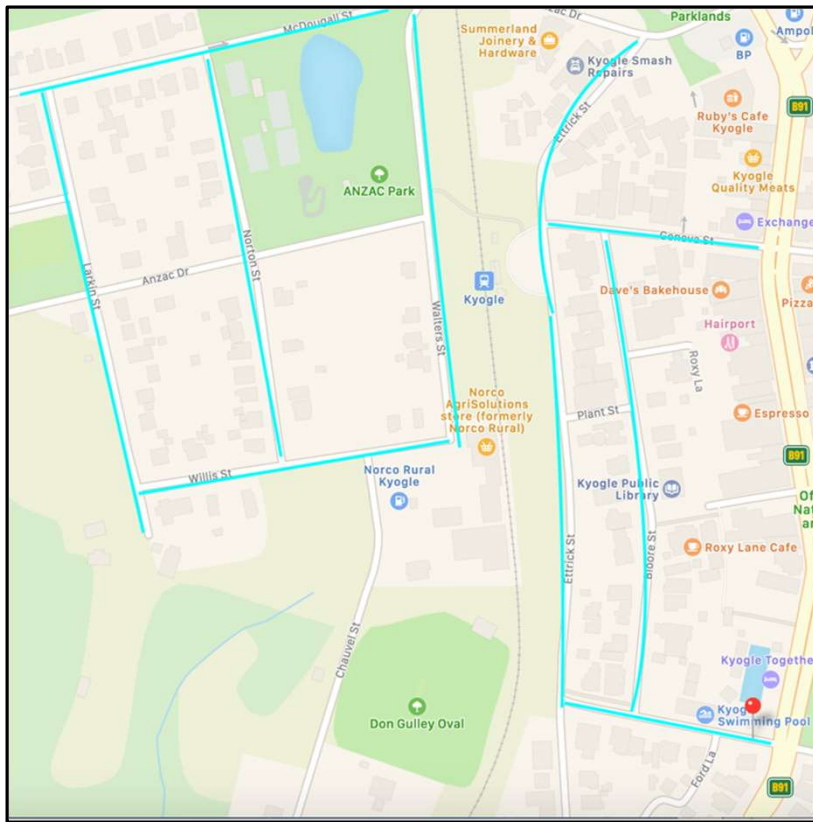
Kyogle Council staff organised the collection and aggregation of waste from each bin type, on the normal scheduled collection dates, from a predetermined number of randomly selected households in each township.

NE Waste staff (3) assisted by Council staff (1-2) completed the audits over four days. The three waste streams were each sorted into 10 categories and measured by both weight and volume. Containers redeemable under the Container Deposit Scheme (CDS) were also counted by item.

Audit data was analysed and provided to Council with this summary report.



Collection Areas – Kyogle and Woodenbong



	Kyogle (West)			Woodenbong		
Bin Type	FOGO (240L x Wkly)	Recycling (240L x Ftnly)	Residual (140L x Ftnly))	FOGO (240L x Wkly)	Recycling (240L x Ftnly)	Residual (140L x Ftnly))
Collection Date	Tues 19/03/24	Tues 19/03/24	Tues 26/03/24	Fri 22/03/24	Fri 22/03/24	Fri 15/03 /24
Number of Bins	50	50	86	25	25	50
Auditing Date	Wed 20/03/24 Audit 2	Wed 20/03/24 Audit 2	Tues 26/03/24 Audit 4	Fri 22/03/24 Audit 3	Fri 22/03/24 Audit 3	Fri 15/03/24 Audit 1
Audit Location	Kyogle Landfill			Woodenbong Waste Transfer Station		

Audit Schedule

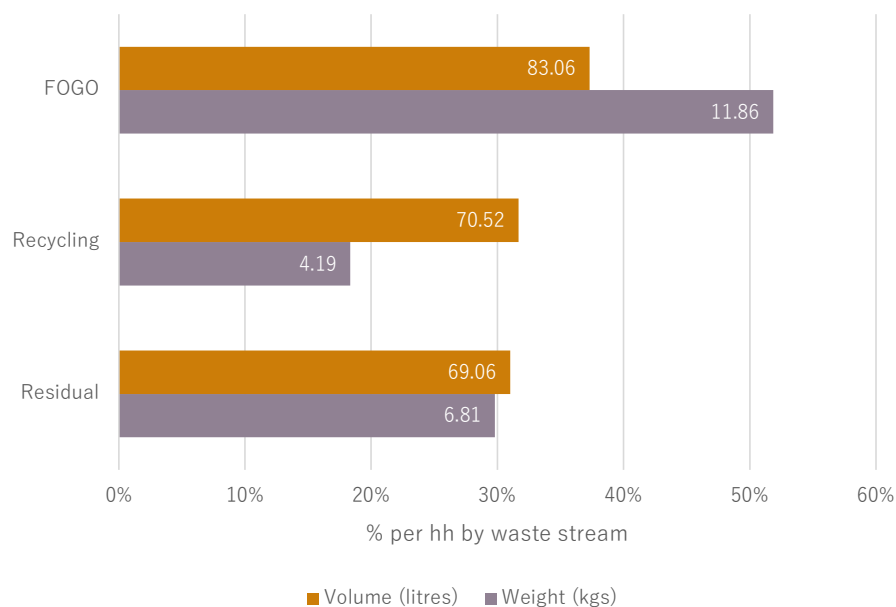


The number of recycling and residual waste bins collected in each area was calculated to be a similar capacity to those collected in the pre-roll out audit, based on the new bin size and collection frequency.

There was no FOGO bin collection prior to the 3 bin roll out in July 2023.

1. Kyogle Township Waste Audit Results

Kyogle - Bin composition per household per week



Kyogle households are generating an average of 22.86kgs per week of domestic kerbside waste including:

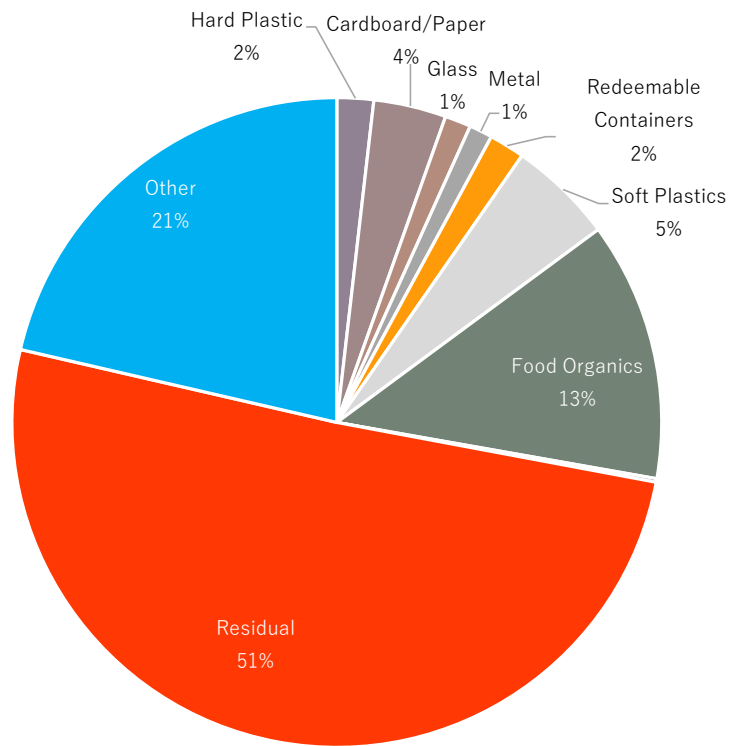
- 11.86kgs per week of FOGO, which is 52% of all waste disposed of via kerbside bins
- 6.81kgs of residual waste – 30% of all waste
- 4.19kgs of comingled recycling – 18% of all waste.

By volume (litres) the quantity of each of the three waste streams is more similar due to the comparatively high density and lower volume of FOGO, particularly the food organic component.

The fullness of bins on the scheduled collection dates indicated:

- residual bin (140L fortnightly) was almost at capacity
- recycling bin (240L fortnightly) was 58% full
- FOGO bin (240L weekly) was 35% full.

Kyogle Residual Waste Stream (Red-lid bin)



Residual bin composition by % weight

Residual (non recoverable) waste is the largest component in the red-lid bin at 51%.

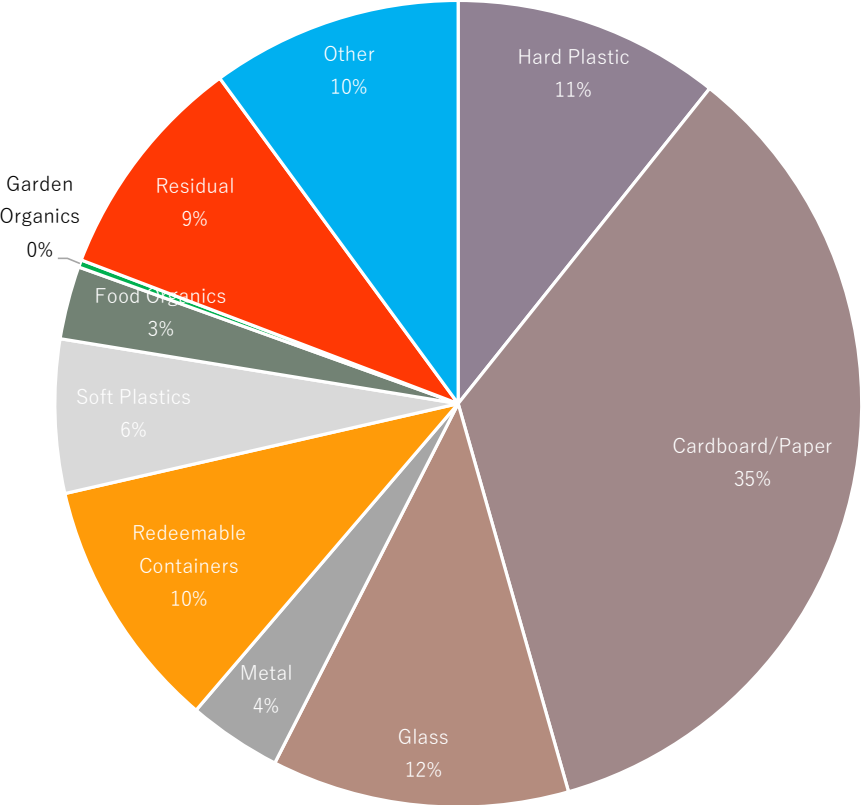
Items categorized as 'Other' were the 2nd largest component at 21% with 173kgs of textile waste being the most prevalent.

Food organics at 151kgs accounted for 13% and could have been disposed of correctly via the FOGO bin.

Materials that could have been placed into the recycling bin including redeemable drink containers, glass, metal, hard plastic, paper and cardboard, together accounted for 10% of the residual bin content.

This data indicates that **23% of the residual waste stream could be recovered** if food organics and recyclables were placed in the correct bins. Emerging opportunities for textile, timber and soft plastic recycling could double this potential recovery rate.

Kyogle Recycling Stream (Yellow-lid bin)



Recycling bin composition by % weight

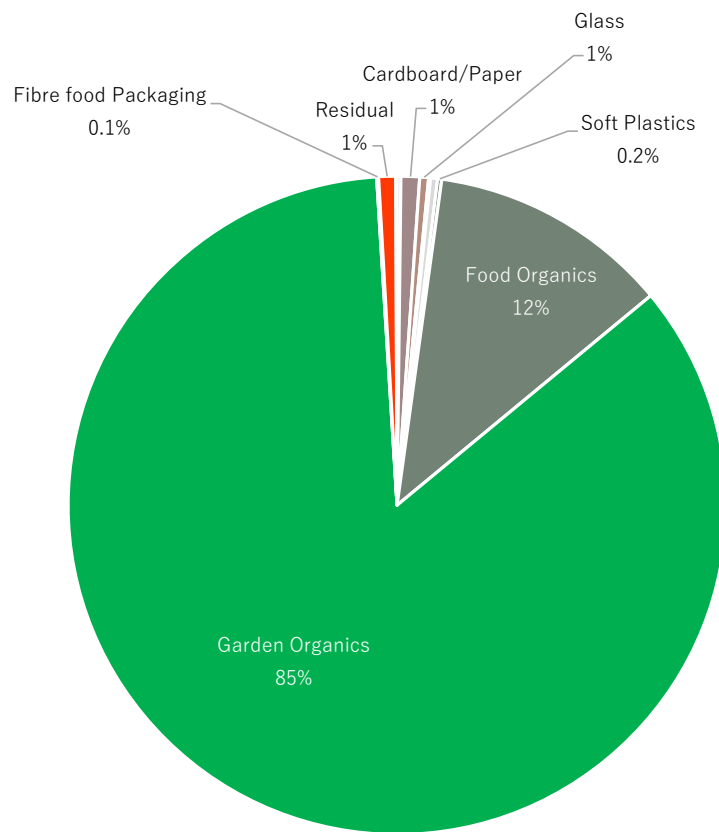
Results indicate that cardboard and paper are the main component of this stream at 35% by weight.

The other recyclable items combined including glass, redeemable drink containers, hard plastic and metal, make up 37%.

18% of the recycle bin contents including residual (9%), soft plastics(6%) and food organics (3%) is considered contamination in the recycling stream, as is the 10% of 'Other' items. Textiles were a significant component (38%) of the 'Other' category.

This equates to a very high contamination rate of **28%** in the recycling stream compared to the regional average of 16% (based on 2022-23 data).

Kyogle FOGO Stream (Green-lid bin)



FOGO bin composition by % weight

Food and garden organics comprised ~97% by weight of the (FOGO) waste stream.

The garden organics content was much higher at 85% than food at 12%. By volume, this differential was even greater at 90% garden and 3% food due to the much higher density of food waste.

Contamination was low at ~3% by weight including:

- 1% cardboard and paper and 0.1% fibre-based food packaging (not including Australian Standard compostable bags and food wrapped in paper). These materials are not accepted via the FOGO bin but due to previous acceptance at the broader level, there may be a perception by some residents that they still accepted.
- 1% residual waste and 0.2% soft plastic packaging
- 1% recyclables (glass, metal, redeemable containers).

Kyogle's FOGO contamination rate was very similar to the regional average (based on 2022-23 data), of 3.25% but much higher than the Woodenbong contamination rate of 0.7%.

Kyogle - 'Other' Items

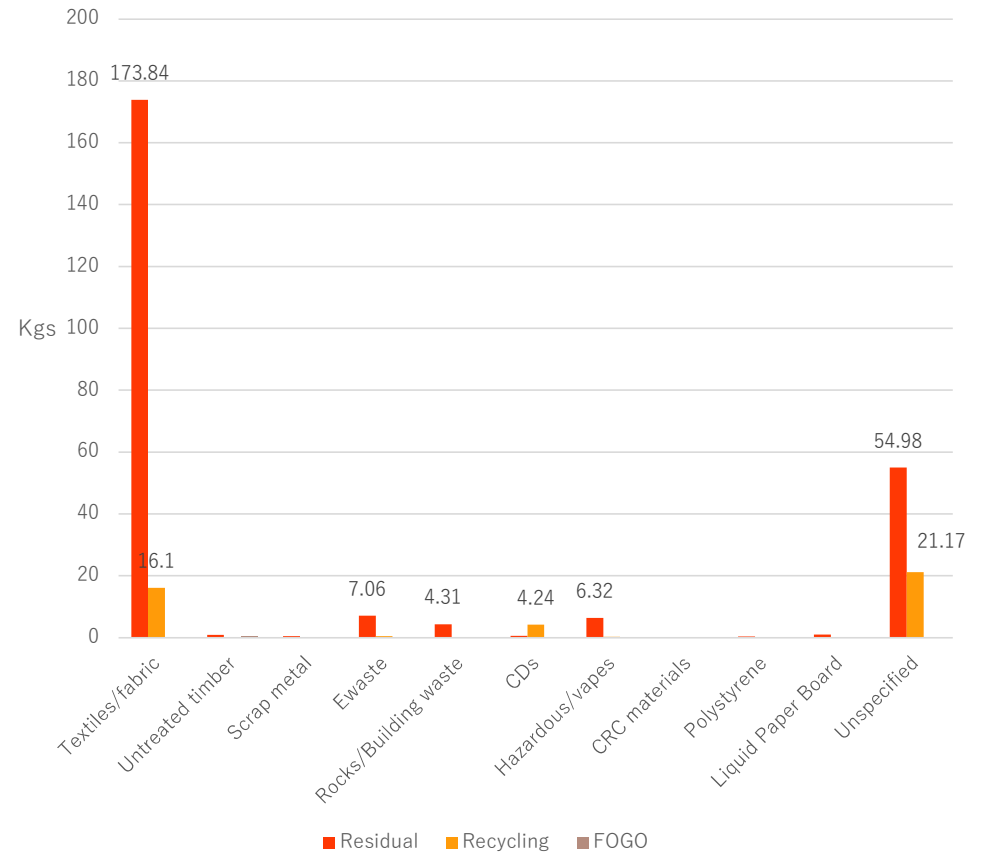


An 'Other' materials category was included into the audit for all three waste streams, to quantify items that can either currently be recovered e.g CRC materials, e-waste or that have the potential to be recovered in a more circular economy e.g. textiles, untreated timber.

Textiles were the largest component identified by both weight (173.84kgs) and volume (775L).

85% of all 'Other' items were disposed of via the residual waste stream, perhaps indicating a desire to do the right thing.

Other materials by weight (kgs) and waste stream



'Other' Items

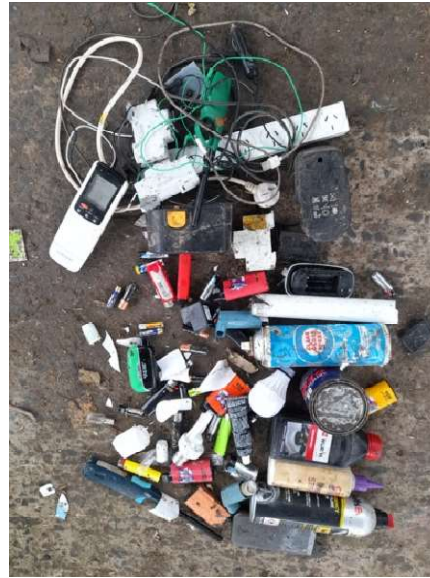
TEXTILES



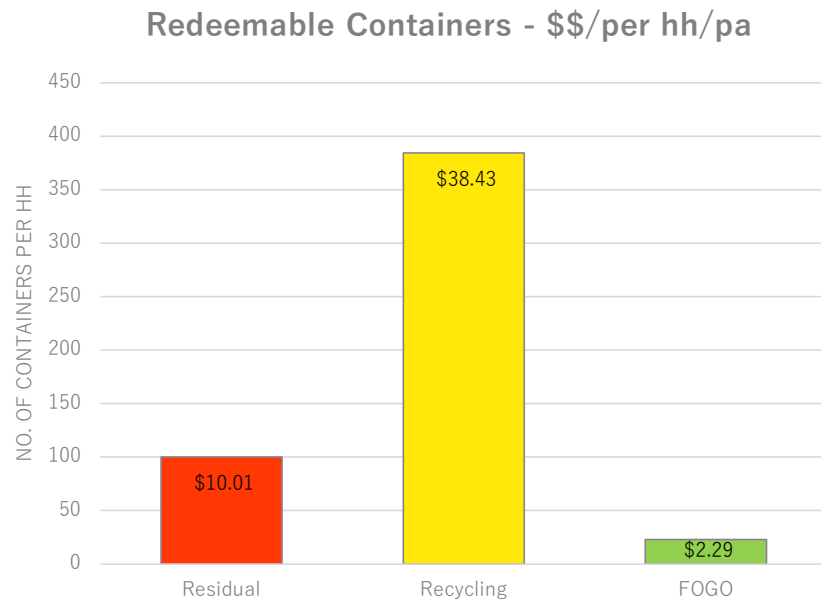
COMPACT DISCS



E WASTE / VAPES



Kyogle Redeemable Containers

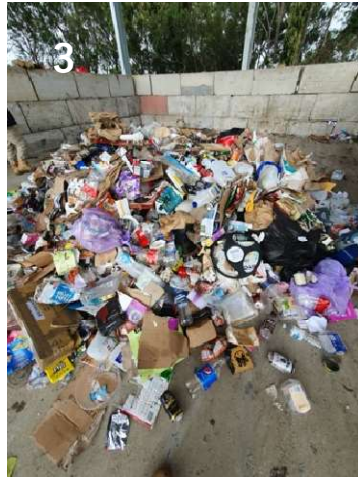


A count of the drink containers that are eligible for a \$0.10 refund via the Container Deposit Scheme (CDS) indicated the presence of some containers in all three waste streams.

The average Kyogle household is disposing of 507 drink containers per year or 9.75 per week, mostly via their recycling bin, although 100 eligible containers per household per year are going to landfill via residual bins.

This equates to a redeemable value of \$50.72 per household per year.

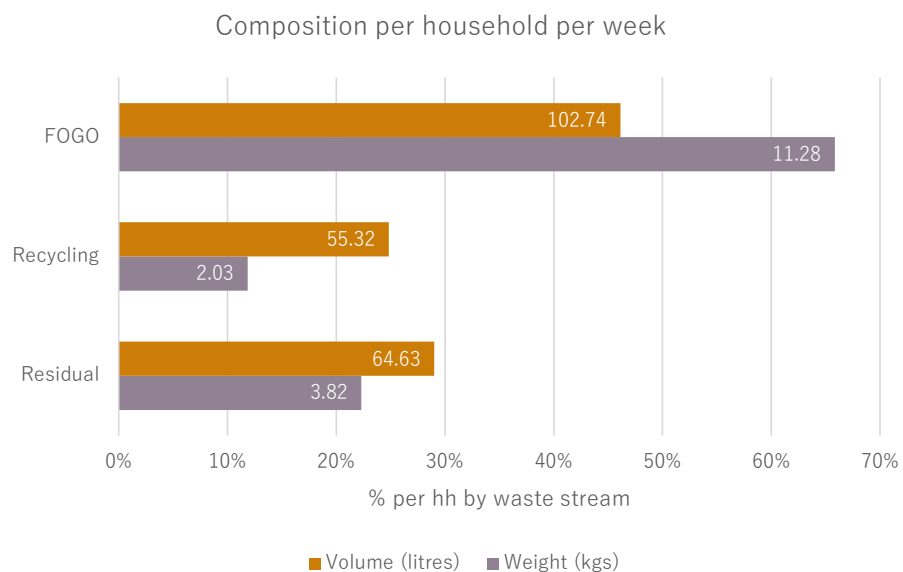
Kyogle Images



1. Residual Waste stream
2. Food organics in the residual waste
3. Recycling stream
4. Food contamination in the recycling stream.
5. Textiles contamination in recycling
6. FOGO stream
7. FOGO - contamination inside compostable food bag
8. Other FOGO contamination



2. Woodenbong Waste Audit Results



Woodenbong households are generating an average of 17.13 kgs per week of domestic kerbside waste including:

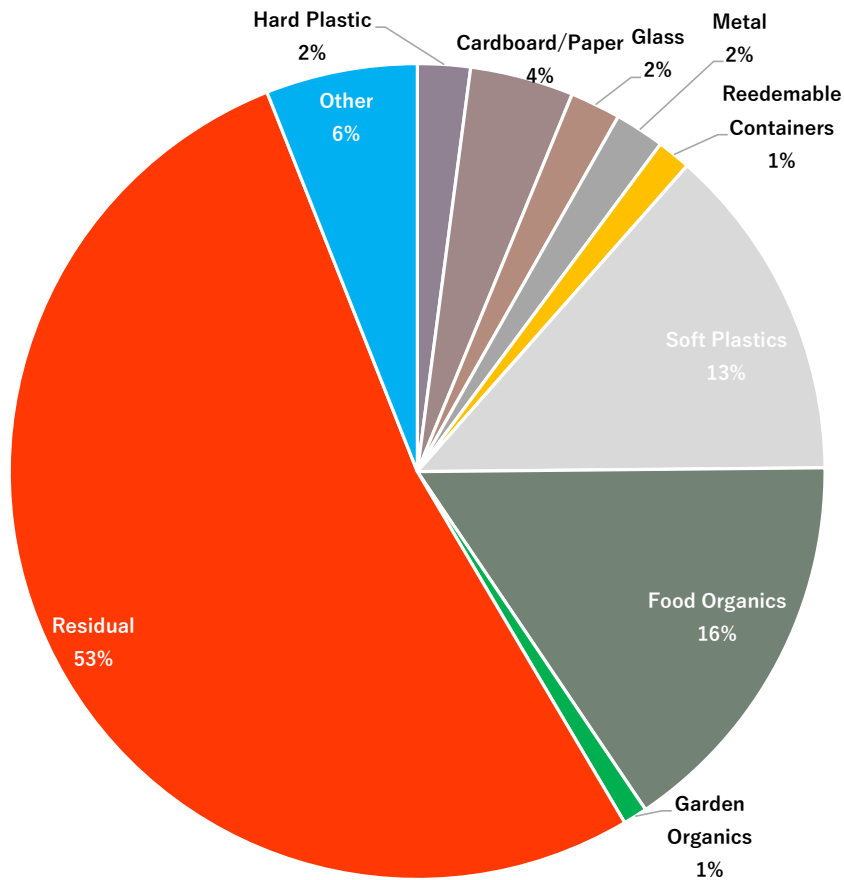
- 11.28kgs of FOGO, which is 66% of all waste disposed of via kerbside bins
- 3.82kgs of residual waste – 22% of all waste
- 2.03kgs of comingled recycling – 12% of all waste.

By % volume the residual and recycling waste streams are similar, but the FOGO stream is significantly lower due to its comparatively higher density, particularly the food component.

The fullness of bins on the scheduled collection dates indicated:

- residual bin (140L fortnightly) was 92% full
- recycling bin (240L fortnightly) was 46% full
- FOGO bin (240L weekly) was 43% full.

Woodenbong Residual Waste Stream (Red-lid bin)



Residual bin composition by % weight

Residual (non recoverable) waste is the largest component in the red-lid bin at 52%.

FOGO is next at 17%, with most being food organics (59.4kgs) and a small quantity of garden organics (3.68kgs). Both could have been disposed of correctly via FOGO bin.

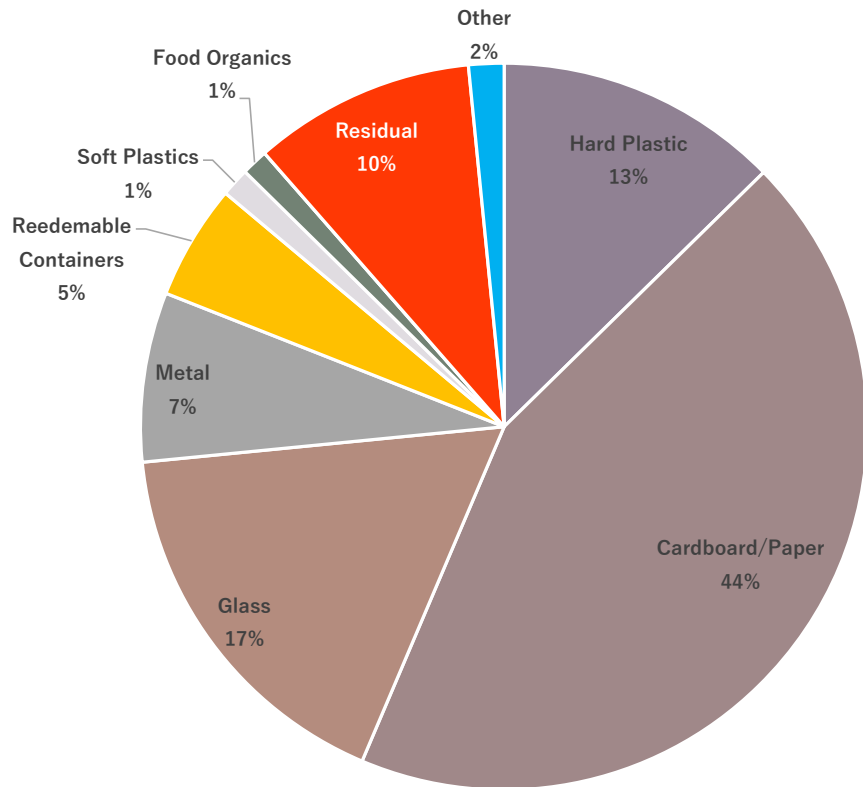
Soft plastics (50.96kgs) was a major component at 13%.

Materials that could have been placed into the recycling bin including reedeemable containers, glass, metal, hard plastic, paper and cardboard, together accounted for 11% of the residual bin content.

This data indicates that **28% of the residual waste stream could be recovered** if FOGO and recyclables were placed in the correct bins.

In addition, improved recovery of 'Other' items e.g CRC materials and metal via existing services and emerging opportunities for soft plastic recycling could further increase recovery rates.

Woodenbong Recycling Stream (Yellow-lid bin)



Recycling bin composition by % weight

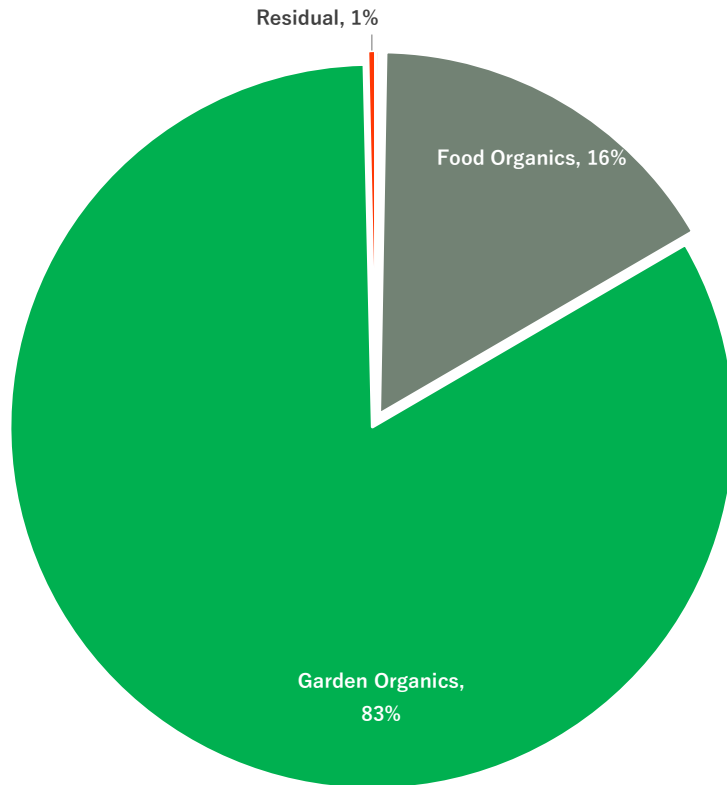
Results indicate that cardboard and paper are the main component of this stream at 44% by weight.

The other recyclable items combined including glass, redeemable drink containers, hard plastic and metal make up 43%.

12% of the recycle bin contents including residual (10%), soft plastics (1%) and food organics (1%) is considered contamination in the recycling stream, as is the 2% of 'Other' items most of which are currently recoverable via existing council services (CRC items and metal).

This equates to a contamination rate of **14%** in the recycling stream compared to **28%** in Kyogle and the regional average of 16% (based on 2022-23 data).

Woodenbong FOGO Stream (Green-lid bin)



FOGO bin composition by % weight

Food and garden organics comprised 99% by weight of the (FOGO) waste stream.

The garden organics content was much higher at 83% than food at 16%. By volume, this differential was even greater at 90% garden and 3% food due to the much higher density of food waste.

Contamination was very low at less than 1% detected.

0.4% residual waste and only 0.2% of cardboard, paper or other fibre-based food packaging (not including Australian Standard compostable bags and food wrapped in paper) was detected in the FOGO waste stream.

Across the Northern Rivers region, the average rate of contamination in FOGO (based on 2022-23 data), was 3.25%.

Woodenbong - 'Other' Items

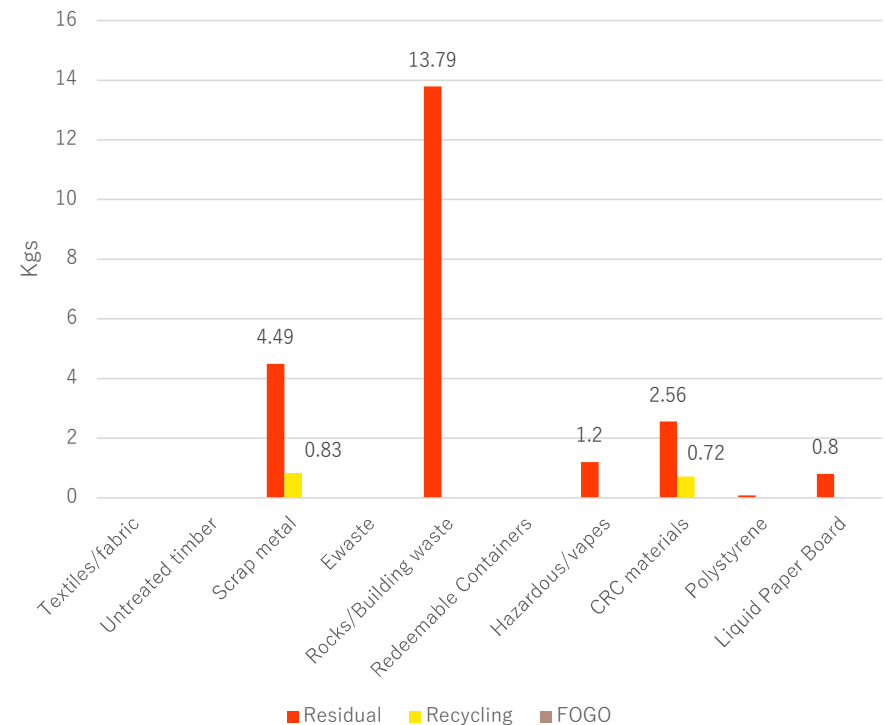


An 'Other' materials category was included into the audit for all 3 waste streams to quantify items that can either currently be recovered e.g CRC materials, e-waste or that have the potential to be recovered in a more circular economy e.g. textiles, untreated timber.

Rocks/building waste, scrap metal and CRC items were the main materials identified.

94% of all 'Other' items were disposed of via the residual waste stream, perhaps indicating a desire to do the right thing.

Other materials by weight (kgs) and waste stream



'Other' Items

BATTERIES



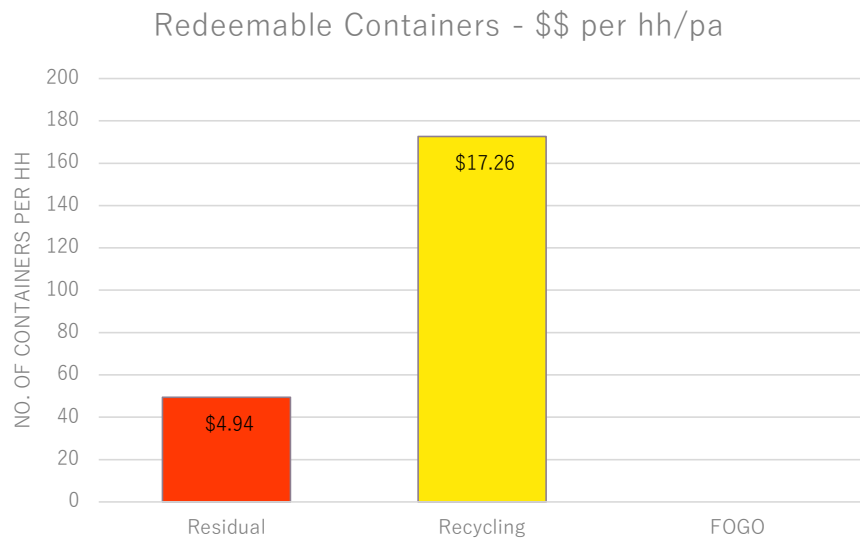
LIGHTBULBS



PAINT



Woodenbong Redeemable Containers

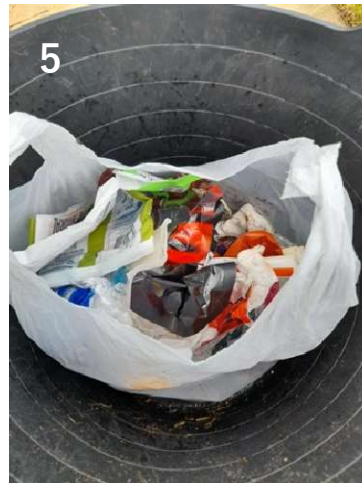


A count of the redeemable drink containers that are eligible for a \$0.10 refund via the Container Deposit Scheme (CDS) indicated the presence of containers in both the recycling (173) and to a much lesser extent, the residual waste (49) stream.

The average Woodenbong household is disposing of 222 drink containers per year or 4.27 per week, mostly via their recycling bin.

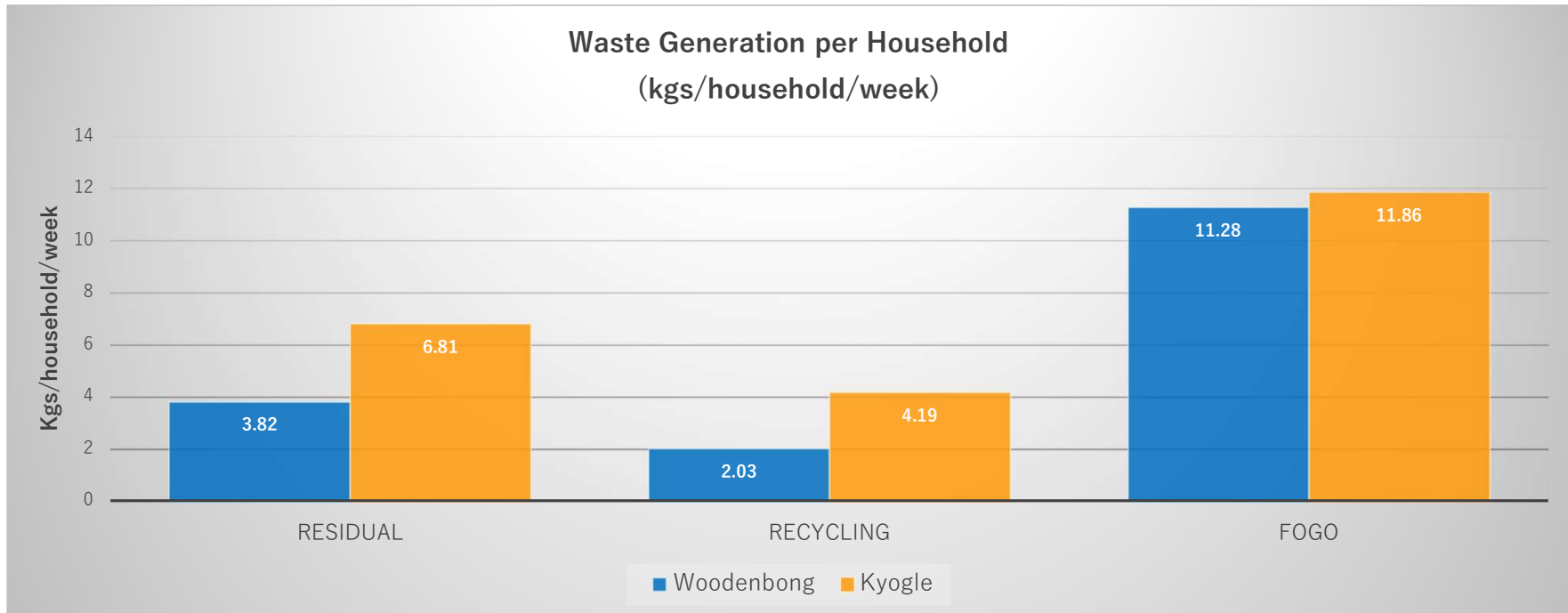
This equates to a redeemable value of \$22.20 per household per year.

Woodenbong Images

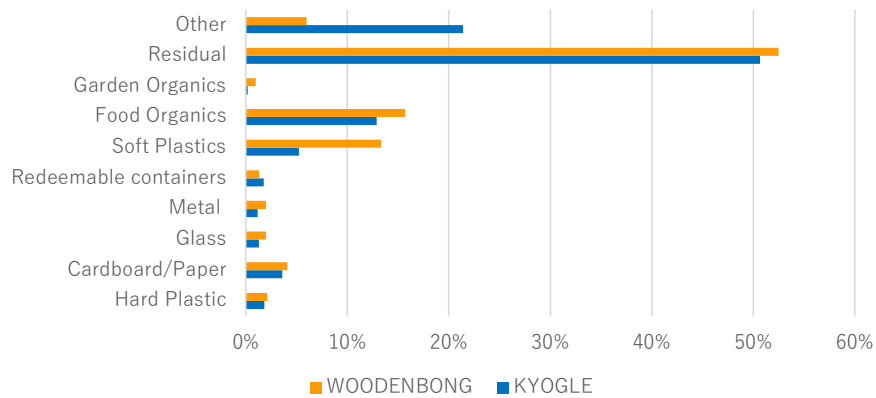


1. Residual Waste stream
2. Recyclables in the residual waste
3. Recycling stream
4. Contamination in the recycling
5. Bagged contamination in recycling
6. FOGO stream (after separation of food and garden organics)
7. FOGO contamination – soft plastic
8. FOGO contamination inside compostable bags

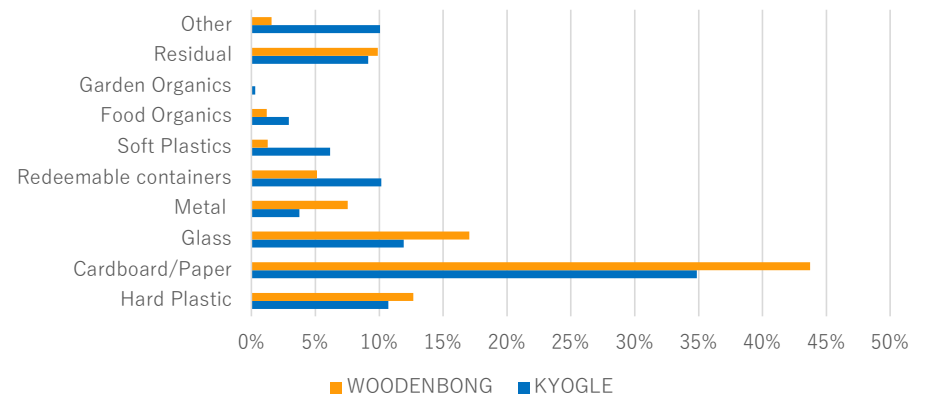
3. Comparison of Results – Kyogle and Woodenbong



Residual waste by % weight



Recycling by % weight

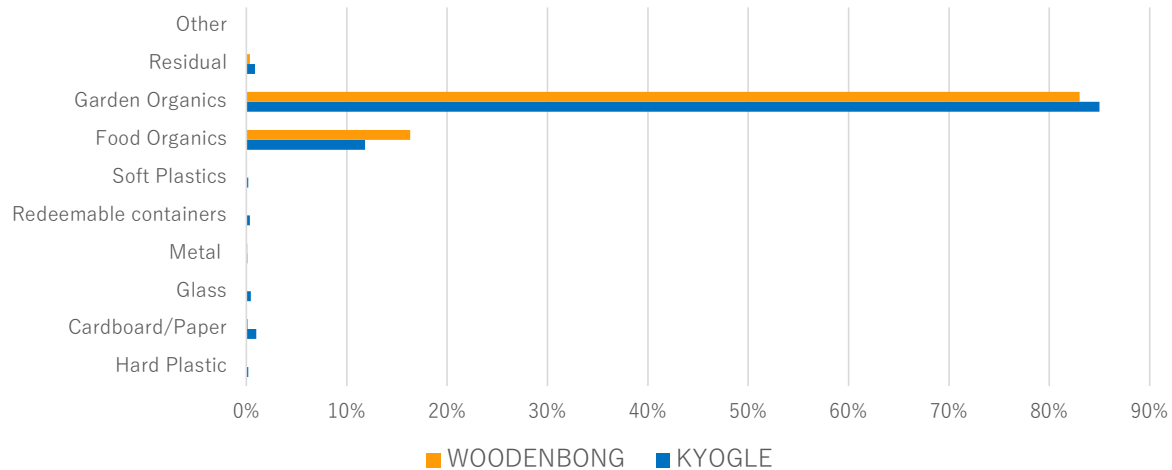


As a percentage by weight, there was significantly more soft plastic and to a lesser extent FOGO, in the Woodenbong residual stream than in Kyogle. The opposite was found for the recycling stream, where there was less FOGO and soft plastic contamination in the Woodenbong recycle bins compared to Kyogle. This result indicates that Woodenbong households are more aware than those in Kyogle, of what should and should not go into the recycling bin.

‘Other’ items were a larger component of both the residual and recycling streams in Kyogle.

The contamination rate in the Kyogle recycling stream, at **28%**, was double that in Woodenbong, which was still high at **14%**.

FOGO by % weight



The FOGO waste stream in Woodenbong contained proportionally more food and less garden organics than Kyogle.

The contamination rate in the Kyogle FOGO stream was close to the regional average (3.25%) at 3.1%. Woodenbong was well below the regional average at 0.7%.

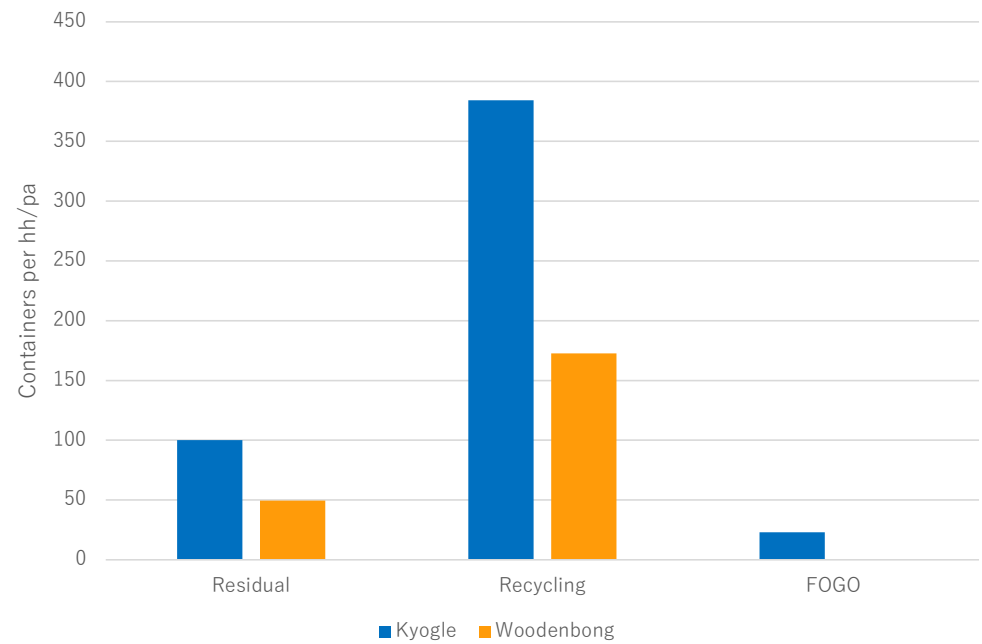
Contamination in Kyogle bins was in the form of a small quantity of cardboard/paper and fibre-based packaging at 1%, residual and soft plastic combined at 1% and comingled items at 1.1%. The minor contamination in the Woodenbong FOGO bins included residual at 0.4%, cardboard/paper at 0.2% and comingled items at 0.1%.

Redeemable drink containers

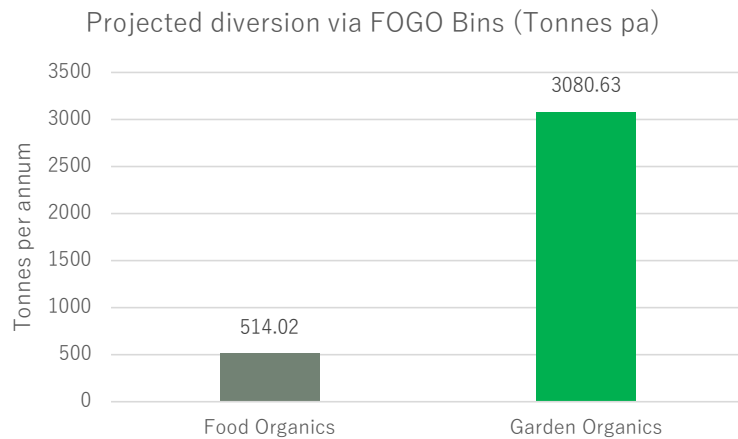
More than double the number of redeemable drink containers were present in all three bins of Kyogle households.

The redeemable value per Kyogle household was \$50.72 pa compared to \$22 pa in Woodenbong.

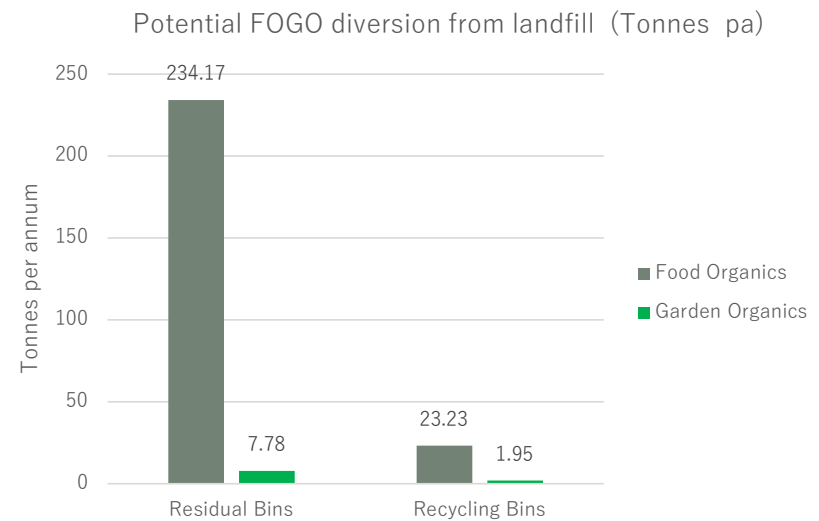
This result is likely due to more Woodenbong residents recycling their redeemable containers via the CDS drop off points.



4. Food and Garden Organics (FOGO) – Potential Diversion



Based on the audit data the projected diversion from landfill of food and garden organics via the FOGO bin is ~3595 tonnes per annum.



Audit data also indicates that an estimated 267 tonnes per annum of FOGO is being incorrectly disposed of via residual and recycling bins - 91% of which is via the residual bins.

5. Comparison of pre and post 3 bin roll out data

PRE-ROLL OUT-BEFORE JULY 2023

1 x 240L split bin (residual / recycling only) – weekly

Woodenbong

Residual (split) bin – 8.46kgs/hh/wk incl. 25% FOGO, 13% recyclables, 2% redeemable containers and 5% other.

Recycling (split) bin – 4.75kgs/hh/wk incl. 46% contamination.

Kyogle

Residual (split) bin – 13.16kgs/hh/wk incl. 49% FOGO, 12% recyclables and 4% redeemable containers.

Recycling (split) bin – 2.83kgs/hh/wk incl. 31% contamination.

POST-ROLL OUT – SINCE JULY 2023

1 x 240L FOGO bin - weekly / 1 X 240L Recycling bin – fortnightly / 1 X 140L Residual bin – fortnightly.

Woodenbong

Residual bin – 3.82kgs/hh/wk incl. 17% FOGO, 10% recyclables, 1% redeemable containers and 6% other.

Recycling bin – 2.03kgs/hh/wk incl. 14% contamination.

FOGO bin – 11.28kgs/hh/wk incl. 0.7% contamination.

Kyogle

Residual bin – 6.81kg/hh/wk incl. 13% FOGO, 8% recyclables, 2% redeemable containers and 21% other.

Recycling bin – 4.19kgs/hh/wk incl. 28% contamination.

FOGO bin – 11.86kgs/hh/wk incl. 3.1% contamination.

Note: Total bin capacity has been increased from 240L per week pre-roll out to 430L per week since July 2023.

6. Comparison to NSW State Averages



This table provides a guideline only to how the audit data for the Kyogle LGA compares to the NSW State and Regional Regulated Areas (RRA) data.

Source: NSW Local Government Waste and Resource Recovery Data Report 2021-22

Average per Household (kgs/hh/wk)	NSW	Regional Regulated Area	Kyogle LGA	Kyogle township	Woodenbong township
Domestic kerbside total	24.16	23.27	20.00	22.86	17.13
Residual waste	11.35	9.15	5.32	6.81	3.82
Recycling	3.73	4.2	3.11	4.19	2.03
FOGO	9.08	9.92	11.57	11.86	11.28

7. Key points and Recommendations

- A significant proportion of the residual bin is being used for FOGO and recyclables, therefore reducing the available capacity for residual (non recoverable) waste and potentially contributing to contamination of other bins or the illegal dumping of excess residual waste (e.g. into park bins). **Recommendation – *There is significant available capacity in both the recycling (yellow lid) and FOGO (green lid) bins to correctly dispose of household waste that doesn't belong in the residual (red lid) bin. This in turn will free up space in the residual bin for currently unrecoverable materials such as soft plastics. The current suite of bins does in fact provide householders with 190L per week more bin capacity than the previous split bin system. It is therefore recommended that the current 3 bin system remains in place.***
- High levels of contamination were found in the recycling stream with 28% in Kyogle and 14% in Woodenbong. This puts Kyogle well above the regional average of 16% contamination and Woodenbong slightly below. Residual including soft plastics and 'other' particularly in Kyogle, and food organics are the main contaminants. **Recommendation – *Ongoing education and community engagement to increase correct use of bins e.g. lift the lid campaign, incentives e.g. smiley stickers or/& prize draw .***
- The FOGO stream was generally very clean with contamination in Kyogle at 3.2% (similar to regional average) and Woodenbong at 0.7% (great result). Cardboard, paper and other fibre-based food packaging (not including Australian Standard compostable bags and food wrapped in paper) was detected at a low level. It appeared that soft plastic, used to wrap food, compostable caddy bags prior to emptying. **Recommendation – *Targeted education around permissible packaging (Australian Standard compostable bags and food wrapped in paper) to prevent soft plastic and other fibre-based packaging contaminating the FOGO stream.***

Key points and Recommendations (continued)

- More than 93% of food and garden organics is being successfully diverted via the new FOGO bin service. The remaining 6.9%, is being disposed of incorrectly, primarily via the residual bin. The potential therefore exists to divert this additional 267 tonnes or at least part of it from landfill. Doing so will also further assist to reduce contamination in the recycling stream. **Recommendation – Targeted education and community engagement. Promote success of the new service and reinforce positive behaviour through local media and a ‘Lift the Lid’ awareness campaign.**
- The ‘Other’ item category was significant particularly in Kyogle and was most prevalent in the residual stream, perhaps indicating a desire to do the right thing. ‘Other’ included materials that can currently be recovered via existing Council services such e-waste or household problem waste items that can be dropped off free at council’s Community Recycling Centre (CRC) or small stations (CRS). It also includes items that have the potential to be recovered in a more circular economy e.g. textiles including clothes and uncontaminated timber. **Recommendation – Increased promotion and communication of existing services such as the CRC and recovery via the Council tip shop or other local options.**
- Despite a 10c return on redeemable drink containers via the state governments Container Deposit Scheme, householders are still disposing of eligible containers in their kerbside bins but could instead be receiving (or donating to charity) an average of \$50.72 per Kyogle household per year or \$22.20 in Woodenbong. Those ending up in the recycling stream will be recovered but those in the residual stream will end up in landfill. **Recommendation – Council could consider encouraging local sport and community groups to install CDS collection points and promote their use to the community.**

Key points and Recommendations (continued)

- There is a significant difference in the practices of householders in Kyogle and Woodenbong. The latter produce less waste per household and have lower rates of contamination in both the recycling and FOGO streams. They also have less redeemable containers in their bins indicating they maybe more regular users of CDS drop off points. They also have significantly less 'Other' items in all three waste streams indicating they have disposed of them via another option. ***Recommendation – Consider why the practices of Woodenbong households are achieving better outcomes in terms of diversion from landfill and how this can be applied in Kyogle.***



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