GREEN INDUSTRIES SA

100% RECYCLED CONTENT BINS

FINAL REPORT

Funded under the Circular Economy Market Development Grants

Government of South Australia

Green Industries SA

PROJECT BACKGROUND

The primary objective of the in-field trial of 100% recycled content was to test the durability and long-term viability of kerbside bins made from 100% recycled materials. The tough service life of MGBs means that they require a high resistance to impact and abrasion, high tolerance to environmental stress, and long-term resistance to UV degradation. Balancing the strength of MGBs while incorporating as much recycled plastic as possible is desirable.

This initiative, conducted in collaboration between the cities of Charles Sturt and Port Adelaide Enfield, with funding support from Green Industries SA, involved approximately 200 properties across the 2 council areas. A new set of 3 bins (consisting of a 140L landfill, a 240L recycling and a 240L organics bin) with bodies made from 100% recycled materials was provided to each property.

To establish a comprehensive assessment and to benchmark the performance of the 100% recycled content MGBs, a control group of similar size was also established. Properties that had recently received a full set of standard kerbside bins (30% recycled content) were identified and formed the control group.

As per the terms of both council's collection contracts, Cleanaway assumes both operational and financial responsibility for the replacement and issuance of all new bins. Their involvement in the project has been central, providing data on bins from both the trial and control groups that have been reported as damaged or requiring replacement.

All trial bins (including the control group) were provided by Trident Plastics – a South Australian bin manufacture located in St Clair. However, during the term of the trial Cleanaway made the decision to switch to a different bin supplier meaning that both the Cities of Charles Sturt and Port Adelaide Enfield are now supplied with bins from a different manufacturer.

Throughout the 18-month trial, all repairs and maintenance requests and reports were recorded and monitored across both the trial group and the control group. In addition, in-field visual inspections have been undertaken, in line with the agreed bin condition matrix (refer to table 1), to assess the condition and performance of all bins.

Condition	General waste	Recycling	Organics
As new			
Working order			
Poor			
Damaged			
Wrong bin			
Total			

Table 1: *Bin condition matrix*

TRIAL DESIGN

Each council nominated a select number of streets to pilot the 100% recycled contents bins. Bins were delivered to the pilot households during July 2023.

Within PAE, 101 trial households were selected from across 3 suburbs. These included:

- North Haven (Thomas Court) – 26 properties with a total of 82 bins rolled out
- Klemzig (Ramsay Street) – 31 properties with a total of 91 bins rolled out
- Lightsview (Kerr Lane, East Parkway Drive, Chard Street and Condon Drive) – 44 properties with a total of 90 bins rolled out.

Within CCS 107 trial households were selected from across three suburbs. These included:

- Allenby Gardens (Lenwanick Street) – 46 properties with a total of 138 bins rolled out
- Grange (Kirkcaldy Avenue and Surrey Street) – 31 properties with a total of 93 bins rolled out
- West lakes (Tobago Court, Grenada Court and Barbados Court) – 30 properties with a total of 90 bins rolled out.

In total, 584 new 100% recycled content bins were provided to a total of 208 properties as part of the trial.

The control group was made up of a total of 225 properties across the two councils (123 properties in PAE and 102 in CCS). Notably, the councils did not replace working bins to establish the control but rather selected properties that had recently been issued bins under standard operation conditions.

RESULTS

100% recycled content bins – PAE

Throughout February 2024 bin condition inspections were conducted on all trial bins and a subsection of the control group bins, due to the dispersed nature of the control group locations.

Table 2 summarises the results of the visual inspection of bin condition for the PAE trial group. All wheels, lids and bin bodies were in good condition, described as near new or in working order and documented as 'as new' within the table below.

Condition	General waste	Recycling	Organics	Comments/ observations
As new	89	67	54	6 properties had additional organics bins
Working order				
Poor				
Damaged				
Wrong bin				
Other	5	10	22	Bins not delivered. Bins not on property or not required by resident. Old bins sighted during inspections
Bin not sited	7	24	27	
TOTAL	**101**	**101**	**103**	

Table 2: *PAE bin inspection results*

Throughout the trial period, reported repairs and maintenance for the PAE trial bins indicated that:

- one organic and one landfill bin were replaced due to being reported as stolen
- one 140L landfill bin required repairs for broken wheels.

100% recycled content bins – CCS

Table 3 summarises the results of the visual inspection of bin condition for the CCS trial group. All wheels, lids and bin bodies were in good condition, described as near new or in working order and documented as 'new' within the table below.

Condition	General waste	Recycling	Organics	Comments/ observations
As new	81	66	75	All organics bins had a visual manufacturing design issue in the lids (refer to images). This same defect was also noted in 4 recycling bins. It did not affect function
Working order				
Poor				
Damaged				
Wrong bin			1	One organics bin was replaced with standard organics bin during trial.
Other				
Bin not sited	21	36	26	
TOTAL	**102**	**102**	**102**	

Table 3: *CCS bin inspection results*

Throughout the trial period, reported repairs and maintenance for CCS trial bins indicated that:

- one organics bin was replaced due to being reported as stolen
- one lid replacement was requested for a 140L landfill bin.

It was also noted that all the 100% recycled content organics bins had a manufacturing defect in the lid (refer to figure 1). This same defect was also noted on 4 recycling bins. This was a visual defect that did not impact on the function or performance of the bins.

Figure 1: *100% recycled content organic MGBs. Note visual defect with dent in lid*

Control bins

Due to the geographical spread of the control group bins and time constraints, a subset of control bins were selected for visual inspections. A total of 225 properties (123 in PAE and 102 in CCS) across the 2 councils made up the control group. Visual inspections were undertaken for 110 properties (48%) in total, with PAE visiting 65 of their properties and CCS visiting 45 properties.

Table 4 summarises the results of PAE's visual inspection of their control group properties.

Condition	General waste	Recycling	Organics	Comments/ observations
As new	58	49	35	
Working order		1		Damage to lid due to tradesperson using as a table for tools.
Poor				
Damaged				
Wrong bin				
Other				
Bin not sited	6	15	30	
Property not inspected	58	58	58	
TOTAL	**123**	**123**	**123**	

Table 4: *PAE control group bin inspection results*

Table 5 summaries the results of CCS's visual inspection of their control group properties.

Condition	General waste	Recycling	Organics	Comments/ observations
As new	38	34	36	
Working order				
Poor				
Damaged				
Wrong bin				
Other				
Bin not sited	7	11	9	One location was a construction site could not access bin
Property not inspected	57	57	57	
TOTAL	**102**	**102**	**102**	

Table 5: *CCS control group bin inspection results*

Throughout the trial, Cleanaway monitored all repairs and maintenance for the control groups and the follow repairs/replacements occurred:

- 8 bins replaced, 5 x 140L landfill, 1 x 240L recycling and 3 x 240L organics bins.
- 6 repairs requested, 4 x lid repairs and 2 x wheel repairs.

CONCLUSION

Throughout the project, a total of 584 black bodied bins, made from 100% recycled plastics were distributed to 208 properties across both council areas. In addition, 225 properties were identified to form part of a control group.

Periodic in-field inspections of the black bodied and control groups bins were undertaken, along with all repairs and maintenance requests recorded and monitored. This information has been used to assess durability and performance of the 100% recycled content bins.

The findings from the in-field trial indicate that there is no discernible difference in the overall performance of the 100% recycled content black bins when compared to the industry standard bins that formed part of the control group.

Both the trial bins and control groups demonstrated durability in the infield testing, with the majority of bins maintaining near-new condition. These results demonstrate the suitability of 100% recycled plastic bins for long-term use in kerbside waste management.

During the term of the trial, Cleanaway changed bin supplier and therefore the councils are unable to deploy these bins more broadly. Engagement with the new bin supplier to identify alternative recycled content bin products will be required and it may be necessary to conduct a secondary trial.