



# Good Caps Pilot Programme

Learnings from Hawkes Bay Schools Lids  
& Caps Product Stewardship Pilot



February 2023



# Contents

<b>1. Executive Summary</b>	<b>1</b>
Overview	1
Key Learnings	2
Recommendations	3
Special Thanks	3
<b>2. What is Good Caps?</b>	<b>4</b>
The Problem	4
Lids and Caps entering the Environment	5
Lids and Caps entering Landfill	5
Regional Collecting Lids Map	5
Valuable Materials Lost from Economy	6
What we did	6
Recruited Schools	6
Provided a collection system	6
Good Caps website	7
Weekly pick ups	7
Data Collection	8
Extension	11
Sale to Local Reprocessors	11
<b>3. What Happened Next?</b>	<b>12</b>
Plastic - Aotearoa NZ Made	12
The Material	12
Contamination	12
Plastic Recycling Process	12
Value of plastic lids and caps	13
Metal - Hayes Metals	14
The Material	14
Contamination	14
Metal recycling process	15
Value of metal lids and caps	15
<b>4. Pilot Incentives &amp; Rewards</b>	<b>16</b>
All Schools	16
Donation to each school	16
Nanogirl Labs PLD to all schools	16
Teacher Profile	16
Impact Summary	16
Teacher Feedback	17
Winning Schools	17
Nanogirl Live show	17
Win Method Recycling Bins	17
<b>5. What did the participants think?</b>	<b>18</b>
Some comments from schools	18
Some comments from students and their whanau	18
<b>6. A Circular Economy for lids and caps?</b>	<b>19</b>
Plastic	19
Aluminium	19
Steel	19



# 1. Executive Summary

## Overview

The Good Caps Pilot was designed and run by an industry-led working group as part of Plastics New Zealand's Circular Economy Programme. This programme is designed to reduce the amount of plastic being lost to landfill, improving the circularity of plastics in Aotearoa New Zealand. It is supported by funding from the Ministry for the Environment's Waste Minimisation Fund. We also acknowledge The Packaging Forum and supporting brands for their financial support and active participation in the project.

Currently, there is a lot of debate around whether lids and caps are suitable for kerbside collection due to their small size, whether tethering lids/caps to their bottles would improve their suitability, and whether they should be included in a mandatory Container Return Scheme (CRS).

While tethered caps, the CRS, and standardisation of kerbside collection to include lids and caps on all packaging could collectively increase the volumes collected for recycling, we believe that a separate lids and caps collection network is required to maximise material recovery. The pilot programme investigated whether an alternative collection system for lids and caps is feasible.

The main aims of the programme were to:

1. Divert lids/caps from landfill and the environment.
2. Raise awareness of environmental issues around lids/caps through educational engagement.
3. Investigate the success of collecting lids/caps separately from kerbside recycling.
4. Collect data around what formats and types of materials the returned lids/caps were.

Twelve primary and intermediate schools in the Hawkes Bay participated in the pilot, with collection taking place over a 10-week duration in Term 3 of 2022. Students were tasked with collecting as many plastic and metal lids/caps as they could during this time, with prizes going to the winning schools. 'Lids and caps' were left deliberately undefined to gauge what students, teachers and families deemed to fit the category. Enthusiasm was high with the incentive of prizes; a fantastic 2,800kg of materials was collected in total. This included 918kg of plastics and 1,926kg of metals.

As some schools were keen to continue, the pilot carried on into Term 4 with four of the original schools and two new schools. The Term 4 phase was unsupported, with no prizes or incentives offered. During this time, a total of 170kg of materials (60 kgs plastics, 110kg metals) was collected. Whilst only a small trial, this lower collection amount suggests that funds or incentives are needed to ensure viability of the scheme.

The collected materials were sold to re-processors to the total value of \$880.89. This money was donated to Lion's Club Charity Partner, Kidney Kids.

The Good Caps project identified that an opportunity exists to capture a valuable and significant resource. Calculations indicate that in the Hawkes Bay catchment alone, the volume of materials in lids and caps is ~1,526 tonnes of plastic and ~2,070 tonnes of metal. With current market values for plastics sitting at ~\$800 per tonne for sorted plastics and ~\$250 per tonne for metals<sup>1</sup>, this combines to a total value of \$1.7 million NZ dollars.

Overall, we consider the trial to have been a success. It provided good insights and a rich set of data that would justify an expanded trial to better inform the best option(s) for New Zealand.



1. Figures vary - estimations based on 2022 data



## Key Learnings

Through the program, the following key learnings were made:

- Schools show interest in students participating in product stewardship, particularly where there is a positive environmental and educational outcome.
- Professional development opportunities helped to increase teacher confidence in delivering the scheme. Ensuring that key information is clear at the start of the program could help to increase enthusiasm and uptake.
- The language used by the scheme could influence the types of materials collected.
- A level of competition appeared to increase motivation for some schools, whilst others were unable to participate fully due to resourcing/Covid impacts and challenges.
- The feedback from the children themselves was overwhelmingly positive with many taking on board the environmental importance of the pilot and expressing a wish for it continue.
- Engagement needs to be simple for schools to co-ordinate, with transparent collection data (e.g. weight/volume). A permanent product stewardship programme for small items through schools would require strong administration and communication, and the use of incentives.
- The pilot relied heavily on volunteer time and resources. More formal arrangements and costing would be required to roll out the project on a national and permanent basis.
- Of the lids and caps collected, 30% of plastic and 4% of metal were from non-beverage products. This represents a significant volume of material that would not be captured by a container return scheme.
- Approximately, 35% of plastic lids/caps did not display a Plastic Identification Code (“PIC”), rendering them non-recyclable. There was insufficient information to provide a full spectrum of brands without PIC identification.
- Plastic lids/caps can be reprocessed onshore in Aotearoa New Zealand and resold as pellets to make new products. Sorting plastic lids/caps down to single material types would increase the scrap value. Single material plastics have an estimated value of more than double of mixed materials.
- Metal lids and caps can be melted into brickettes in Aotearoa New Zealand and are sent offshore for reprocessing into new products. Although magnet technology can be used to separate aluminium from steel, clean, single material bales are most valuable.

## Recommendations

### 1. Plastic Identification Codes:

A significant amount of plastic lids/caps were non-identifiable due to their plastic id code being either missing or illegible (too small). Recommendation is for regulations that mandate the use of and legibility of a plastic identification code on all plastic lids/caps.

### 2. Clean Streaming and Recovery

The trial showed a significant opportunity to improve material 'clean streaming' (collection of separate material types) and increase recover rates. It found that around 30% of plastic and 4% of metal lids and caps collected would be outside of the proposed CRS. It is uncertain if these figures might be higher if different language were used - the name 'Good Caps' could support an unconscious bias towards collecting beverage caps over other items. Recommendation is for a larger trial to be conducted, including using community collection sites and more inclusive language, to better assess the value of leaving lids on or off their bottles (irrespective of whether it becomes part of the proposed CRS).

### 3. Wider Collection Network

While the trial through schools was successful, the incentive of a prize drove this as much as the desire to support environmental outcomes. We recommend conducting a larger trial that includes hospitality and community collection networks. Further work is required to understand the cost of this process and, ultimately, the cost to producers.

### 4. Specific Lids/Caps Collection System

Globally, we are seeing an increase in 'tethered' plastic lids - where plastic lids are attached to their bottles helping to avoid them being lost. The working group supports tethering; however, it appears at least several years away and doesn't help to capture metal lids. Thus, we recommend that consideration should be given to developing a cap specific collection system.

### 5. Payments across the supply chain

While the collection of lids and caps continued to operate in the region for Term 4 of 2022 the volume of material collected dropped significantly in this period. Without the project team support, rewards, or funding, the yield for Term 4 was 10% of that achieved in term 3. We recommend that due consideration need to be given to formal management of the collection network and the funding of all aspects of the supply chain.

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## Special Thanks

Thank you to the organisations that provided funding support and considerable time into creating and running the Good Caps pilot. Good Caps would not have been possible without this support, and we greatly appreciate your willing participation and involvement.

We'd also like to provide a special mention for the Lions Club. Good Caps aligned well to the environmental goals of Lions Clubs. Lions Clubs actively seek out projects or programmes of work where there is an environmental benefit. Good Caps is very grateful to all the Lions Clubs volunteers who made the pilot possible. In particular, Faye Nugent (Lions Clubs, Zone 2 Chair) and Simon Williams (Lions Clubs, Service Chair), who were instrumental in ensuring the Lions Clubs members worked closely with all schools and Waste Management.

*"We're really thrilled to be involved in this. The environment is a high priority for Lions and helping young people make a difference is especially important to us."*

Faye Nugent shared Lions Clubs' views on the Good Caps Pilot



## 2. What is Good Caps?

The Good Caps programme was developed by Plastics NZ, in association with a number of businesses, in response to evidence that plastic and metal lids/caps make up a significant portion of litter in Aotearoa New Zealand and have no current collection and recycling solutions. The primary goals were to divert lids/caps from landfill and the environment, educate students about waste recovery and the circular economy, test the feasibility of a separate recovery system for lids and caps, and collect data around the items recovered. The Good Caps ran a pilot across 12 schools in the Hawkes Bay area in Term 3 2022.

### The Problem

#### Lids and Caps Entering the Environment.

Lids and caps are often found littered in the environment. Sustainable Coastlines data shows 12,500 plastic lids and caps and 1,200 metal lids and caps are found on our coastlines around Aotearoa NZ every year.

#### Lids and Caps Entering Landfill.

Based on research across all council websites in Aotearoa NZ, the vast majority of councils advise residents to put lids and caps into their landfill bin as they are too small to be effectively recovered through national kerbside recycling. The map on the next page shows where lids and caps are/are not collected through kerbside recycling.

As of May 2022, only seven local councils were collecting lids and caps with kerbside recycling.

When lids/caps do stay with their bottles, they sometimes get sorted and recycled. However, Material Recycling Facilities (MRFs) in Aotearoa New Zealand are not set up to sort lids and caps or other small items. They fall through the conveyor systems and end up in a Fines Bin, the contents of which goes to landfill.

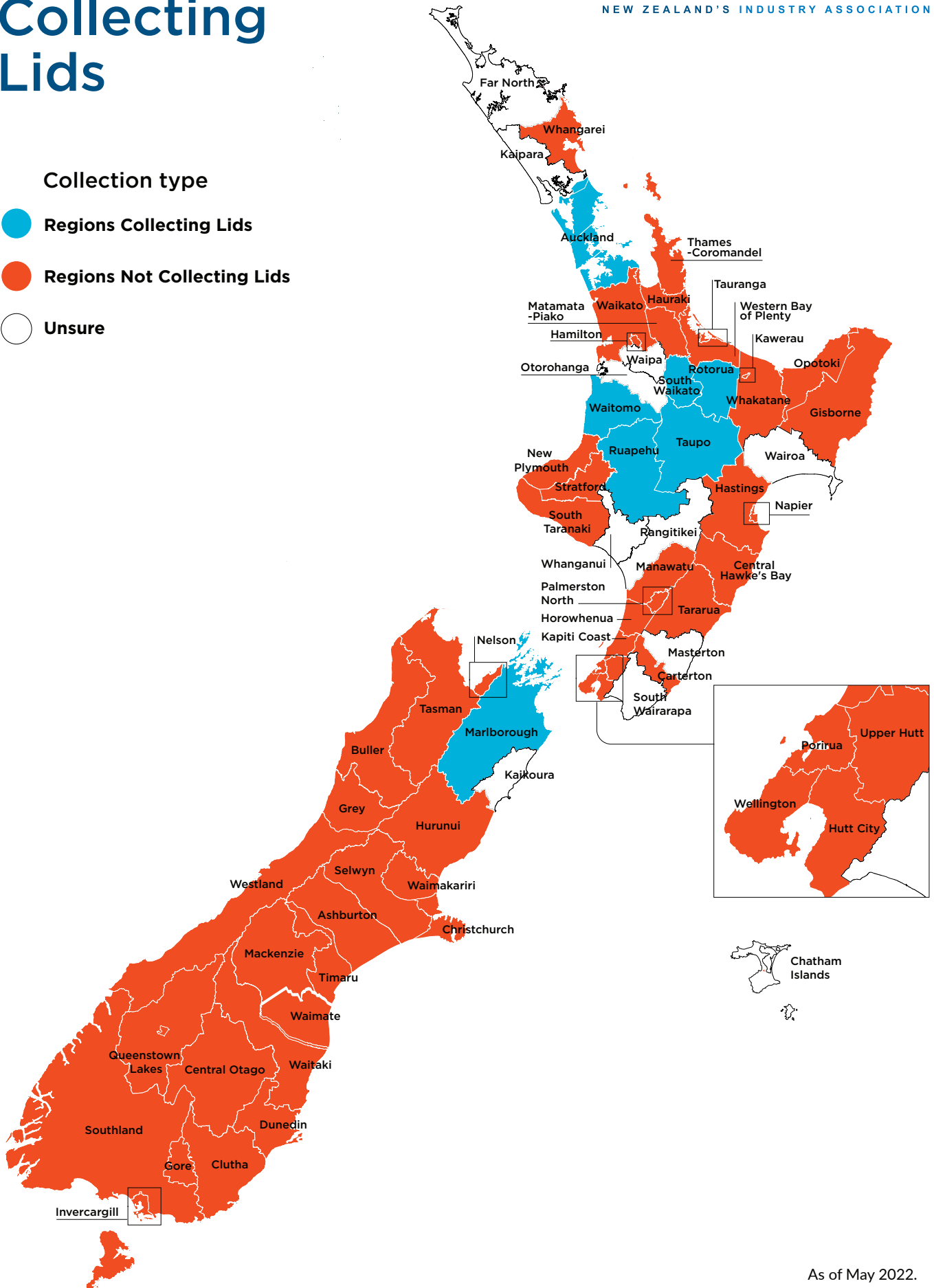
In addition, many lids/caps are not the same materials as the containers they match. This causes issues if sorted into the same recycling streams.





# Regions Collecting Lids

- Collection type
- Regions Collecting Lids
  - Regions Not Collecting Lids
  - Unsure



As of May 2022.

## Valuable Materials Lost from Economy

Good Caps has estimated that there are approximately 5,000 tonnes of plastic and metal lids and caps ending up in landfills throughout Aotearoa New Zealand each year. While this isn't a significant amount in the context of the 12.59 million tonnes of total waste sent to landfill each year, lids and caps are highly recyclable and represent value in the economy (initially as scrap, and then as more valuable recycled resources that will be used to make new products). The circular economy aims to keep resources in circulation, maximizing on their value.



## What we did

### Recruited Schools

Good Caps approached 20 schools in the Hawkes Bay to participate in the pilot. Twelve schools agreed to participate.

#### The participating schools were:

- Bledisloe School
- Clive School
- Greenmeadows Primary School
- Hastings Intermediate School
- Haumoana School
- Havelock North Primary School
- Nelson Park School
- Puketapu School
- St Josephs School
- St Mary's Catholic School
- Tamatea Intermediate School
- Westshore Primary School

### Provided a collection system

Each participating school was provided a collection kit containing:

- Collection boxes and liners
- Information and instruction sheets
- Labels and bags for student collection

Each participating student was given two clear zip lock bags to take home: one for plastic and one for metal caps.

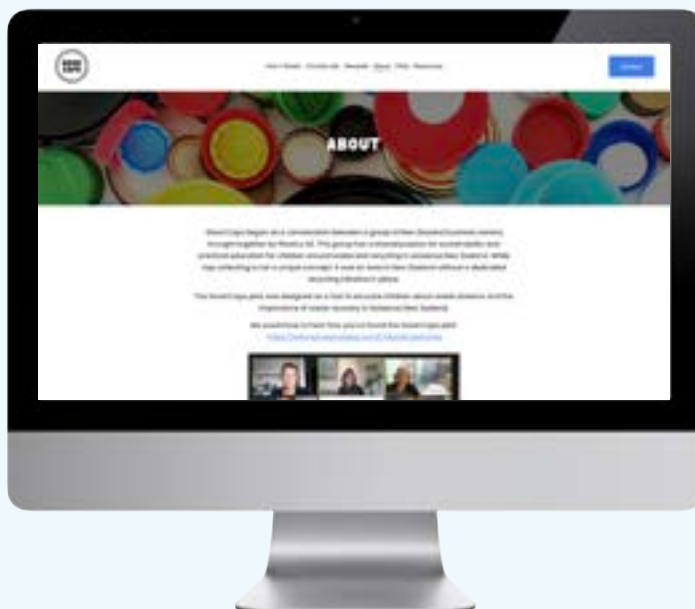
Every week, students were instructed to collect as many lids and caps as they could (either post use or through finding them in the environment). They were asked to bring their lids and caps back to school and sort them into the correct collection boxes.





## Good Caps Website

We wanted to ensure that there was a good source of information available for participating schools. We created a website ([www.goodcaps.org.nz](http://www.goodcaps.org.nz)) to host all the information that schools might need to actively participate in the Good Caps pilot.

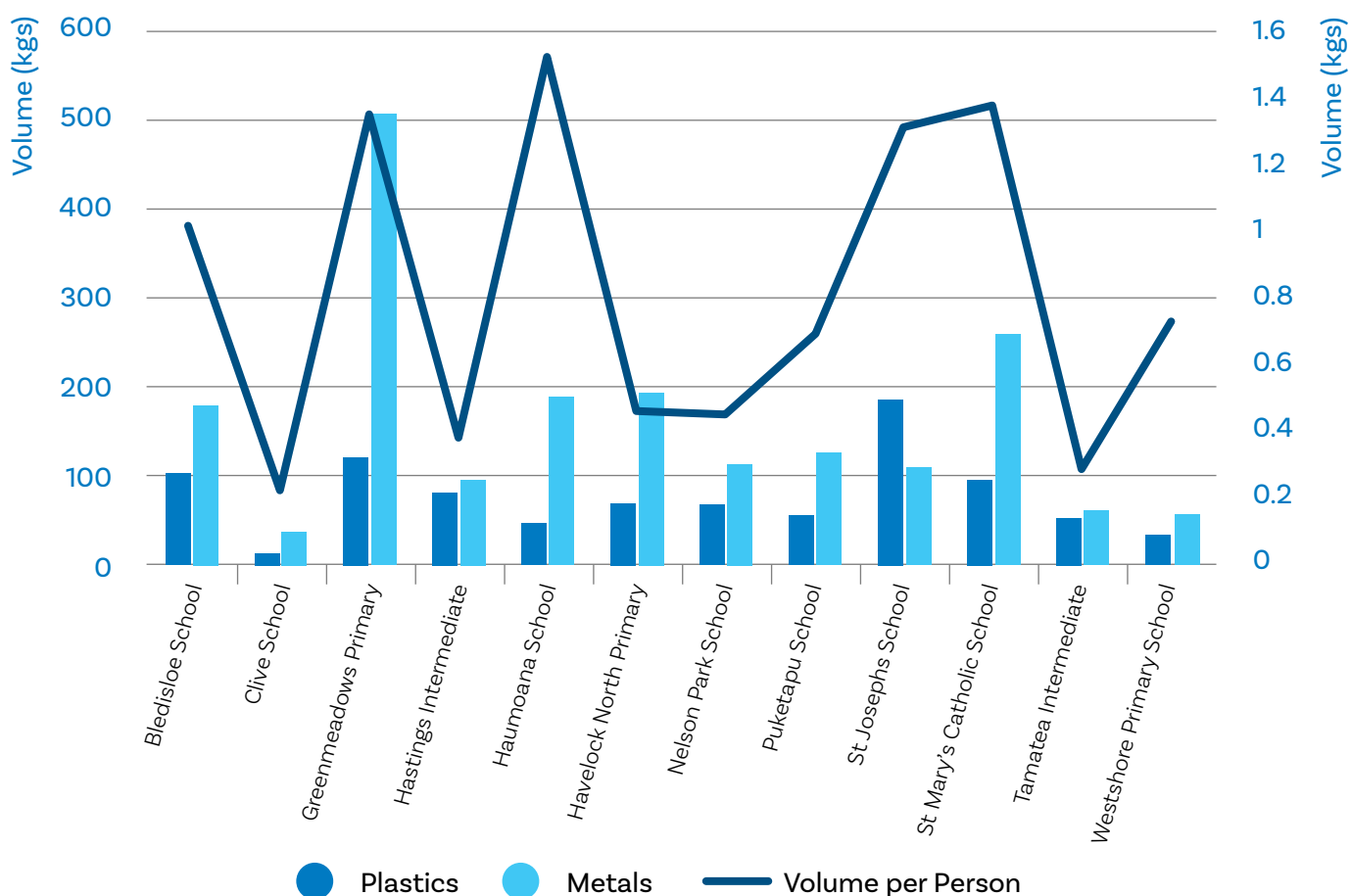


## Weekly pick ups

They volunteered their time to undertake weekly pick ups of lids and caps from the 12 participating schools, and take them to Waste Management in Napier, where they were weighed

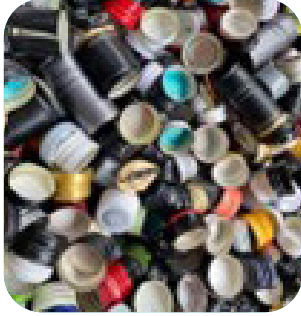
and audited. The table below shows the volume of plastic and metals lids and caps collected, along with volume per person, for each school.

Volume of Lids and Caps Collected by School (KG)

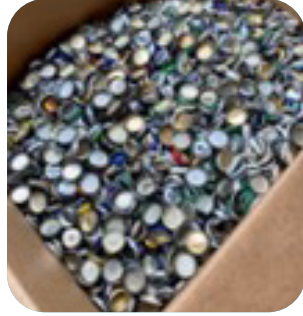


## Data Collection

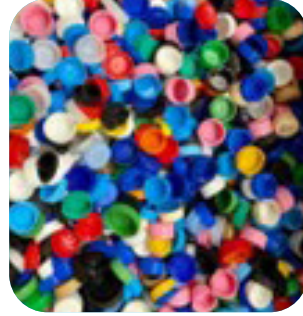
Waste Management were another key partner in the Good Caps pilot. They received weekly drop offs of lids and caps from Lions Clubs members and carried out an audit of the contents. The images below are of a sorted sample of the collected material and show the types of items gathered.



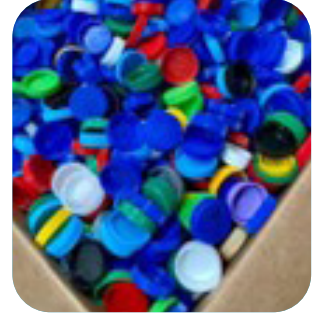
Ref A: Wine Caps



Ref B: Beer Caps



Ref C: Plastic Caps



Ref D: Plastic Caps



Ref E: Can Clip Caps



Ref F: Alu Caps



Ref G: Coffee Caps



Ref H, I, J, M: Plastic Lids



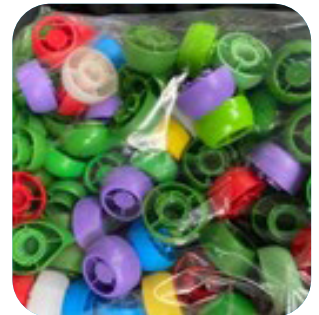
Ref L: Baby Powder Lids



Ref N&O: Sipper Bottle Caps



Ref P: Unkown Caps



Ref Q: Liquid Yogurt Caps



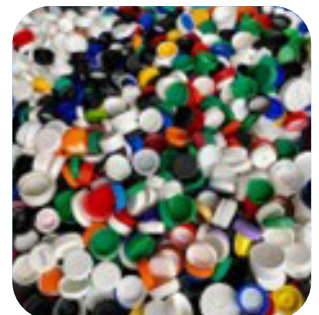
Ref R: Bottle Holders



Ref S: Vape Refill Caps



Ref T: Other Misc.



Ref U: Other Caps

**DURING A  
10 WEEK  
PERIOD**



**OF LIDS &  
CAPS WERE  
COLLECTED**



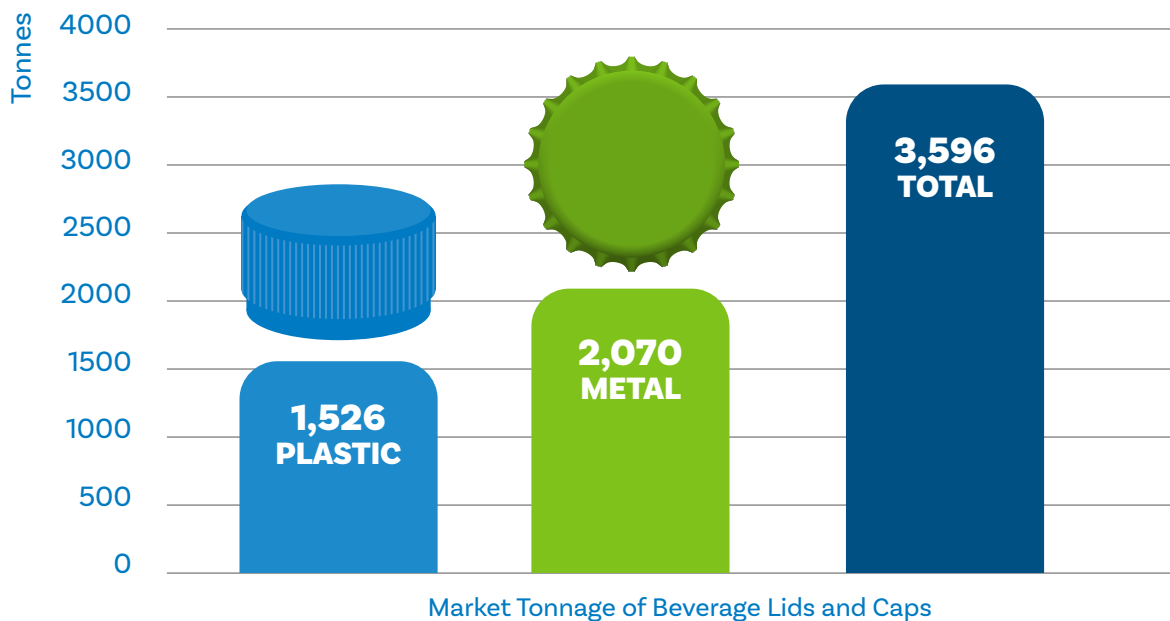
Weekly samples of metal and plastic materials were taken and set aside for detailed analysis. In total 32.88kg of plastic and 28.16kg of metal caps & lids were hand sorted, weighed, and assessed.

## Beverage vs. Non-Beverage Data

As the proposed CRS would capture materials from beverage products, the items were sorted to identify the beverage ratio. We found that, by weight, 70% of the plastics and 96% of the metals collected were from beverage products.

Utilising the CRS volume data and the Good Caps beverage percentage, we then calculated the annual market tonnage for beverage lids and caps, using an average weight of 2g per beverage lid. This gives a good indicator of the volume of materials in lids and caps that could be captured by the CRS.

The results were:



Of the lids and caps collected, 30% of plastic and 4% of metal were from non-beverage. This shows that there is a significant volume of material that would not be captured by the CRS. Furthermore, it's possible that these figures aren't an accurate percentage of true volumes as the language used in the scheme could have had an impact on the types of items

collected. For example, we were surprised to see relatively few jam jar lids in comparison to beer bottle caps. We wondered whether the name 'Good Caps' influenced the student and whanau mentality around what they should collect. Further trials would help to test this and provide a clearer picture of non-beverage volumes.



## Plastics Data by Weight from Sample

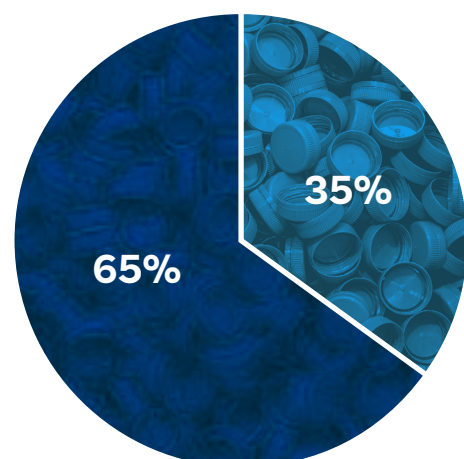
Item Type	Picture Reference	Category	Product ID Code	Material Type	Weight in Kgs	Representation
PLASTIC BOTTLE CAPS	C	Beverage	2	HDPE #2	6.092	19%
PLASTIC CAPS	D	Beverage	2	HDPE #2	10.402	32%
SIPPER CAPS	N, O	Beverage	2 AND NONE	HDPE #2	1.116	3%
OTHER	P, Q, S, T, U	Mixed	NONE	PP #5, HDPE #2, LDPE #4	9.896	30%
COFFEE CAPS	G	Non-Beverage	NONE	HDPE #2	1.2	4%
ICE CREAM LIDS	M	Non-Beverage	5	PP #5	0.738	2%
GOLD BABY POWDER LIDS	L	Non-Beverage	NONE	LDPE #4	0.532	2%
LIDS (varied)	H, I, J, K	Non-Beverage	5	PP #5	1.82	6%
RED BOTTLE HOLDER DOOFERS	R	Non-Beverage	2	HDPE #2	1.086	3%

### Notable findings were:

- The Product Identification Code (PIC) was absent or illegible on 35% (by weight) of the lids/caps. On further inspection of these 'unidentified' items, the following was determined:
  - Gold Baby Formula lids were confirmed to be LDPE (0.53kg in all)
  - Instant Coffee lids were confirmed to be HDPE (1.20kg in all)
  - The 'unidentified lids' were found to mostly be a mixture of HDPE and PP, and a small number were LDPE. Recognizable by brand/product these lids and caps included beverage, chilled food, cosmetic and janitorial household products.
- 57% of plastic lids and caps with legible PICs were HDPE.
- 8% of plastic lids and caps with legible PICs were PP.

Overall split between plastic material types based on weight was 87% HDPE, 11% PP and 2% LDPE

### Plastic Identification Code



- Present and Readable
- Absent or Illegible

## Metal Data by Weight from Sample

Product Type	Picture Reference	Category	ID	Type of Material	Sample KG	Representation
WINE BOTTLE CAPS	A	Beverage	No	Aluminium	6.56	23%
BEER BOTTLE CAPS	B	Beverage	No	Steel	19.13	68%
CAN CLIPS	E	Beverage	No	Steel	1.296	5%
METAL/ALU LIDS	F	Non-Beverage	No	Mixed	1.178	4%
<b>TOTAL</b>					<b>28.16</b>	

### Notable findings were:

- Metal lids/caps do not carry metal identification markers
- 96% of lids and caps were from beverage containers.
- 68% of lids and caps were from beer type products.
- 4% of lids and caps were non-beverage.

## Extension

While the Good Caps pilot was undertaken in Term 3 2022, we asked schools if they wanted to carry on collecting lids and caps in Term 4. Four schools continued participating, and two new schools joined.

The weights of lids and caps collected in Term 4 were minimal as we tested collection without any competition, incentives or communications with schools. Approximately 60 kgs of plastic and 110 kgs of metal lids and caps were collected in total.

Feedback from the Lions Clubs members was that schools are too busy Term 4 to undertake this kind of activity, whereas Terms 2 and 3 are more appropriate.

### Sale to Local Reprocessors

Good Caps sold the lids and caps to Aotearoa NZ Made and Hayes Metals for a total of \$880.89. All proceeds will be donated to the Lions Clubs' charity partner, Kidney Kids.

# 3. What Happened Next?

What happened to the material once it was sold to the reprocessors differed for plastics and metals.

## Plastic - Aotearoa NZ Made

Aotearoa NZ Made was asked to reprocess the plastic lids and caps and provide feedback on the quality of the material, level of contaminants, and desirability of community collected cap and lids as a future source of recycle. They were also asked what value such a feedstock might hold in the New Zealand circular economy.

### The Material

The plastic lids/caps were sold to Aotearoa NZ Made, based in Palmerston North. Over the 10-week period, 918kgs of plastics lids and caps were collected.

### Contamination

Based on the initial audit from Waste Management, the lids/caps were very clean (though sometimes wet) and contained very little contamination.

#### The contamination found was as follows:

- **Metal lids** - a small amount of metal lids were found in the bulk bags delivered to Aotearoa NZ Made (see Image 1).
- **Seals and Wadding** - irrespective of the material the seals and wadding are made from, the process is able to



remove them from the final recycled plastic - the process chips, washes, and filters the material twice before the recycled plastic is extruded and cut into pellets (see Image 2).

- **Calcium Carbonate** - a filler used in plastic product manufacture - the amount used will vary but it does need to be removed before the plastic can be reprocessed. During the washing and filtering process the calcium carbonate is removed and forms a silt that is shoveled into waste bags and sent to landfill.



Image 1: Metal lids



Image 2: Seal and wadding



# Plastic Recycling Process

## Stage 1: Sorting, Cleaning & Chipping



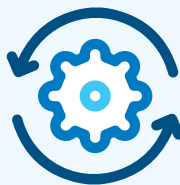
### Stage 1: Sorting, Cleaning & Chipping

- Bulk bags of lids and caps are hoisted up and tipped onto a platform.
- A staff member 'sweeps' them towards a gravity fed hopper – as they sweep the items, they check for contaminants and hand pick out anything that is not plastic.
- The lids and caps fall into a grinder which shreds and chips the caps into little slivers of plastic.
- The slivers of plastic are sent through a water bath and deposited back into a one tonne bag.
- As the bag is a mixture of PP and HDPE it cannot be reprocessed as it is. It must be added in small quantities (dosed) to pure mixes separate plastics.
- As the bulk of the lids and caps are HDPE, the mixed plastic chips are kept aside until they can be dosed into future HDPE recyclate.

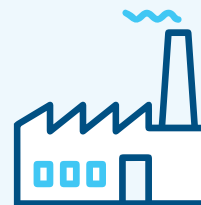
### Stage 2: Dosing & Reprocessing

- The mixed plastic slivers and chips will be slowly dosed into pure HDPE chips that are ready to be melted down.
- Staff add the mixed plastic to the pure HDPE recyclate - roughly about 10% mixed plastic is tolerable in the process.
- Plastic chips are heated to around 280 degrees and extruded into 'spaghetti' like strings of plastic.

## Stage 2: Dosing & Reprocessing



## Stage 3: Remanufacturing



- The strings of plastic are pulled through a long water bath to cool them down.
- Once cooled the strings pass through a set of blades that chop the string into little pellets.

### Stage 3: Remanufacturing

- The specific plastics recyclate the lids and caps were dosed into is used by Aotearoa NZ Made to manufacture garbage bags.
- Pellets are mixed with small amounts of 'masterbatch' black and stored in a silo ready for processing into product.
- Pellets are vacuumed up into the blown-film<sup>3</sup> process which melts and blows the plastic into a long continuous tube of plastic.
- The tube of plastic film is simultaneously cut and sealed to create garbage bags, and hand packed for distribution.

The factory also produces other sheet products from the recycled plastic such as damp proofing sheets for concrete slabs.

The factory on-sells some of the recyclate to manufacturing customers throughout NZ. Typically, this recyclate is not from the mixed plastic bales as the manufacturers need high quality, pure plastics for their processing.

3. <https://youtu.be/YSTp0JBobLY>

## Value of plastic lids and caps

If plastic lids and caps were readily available as ongoing feedstock, Aotearoa NZ Made believe they would purchase the material again. The material value is dependent on the level of sorting undertaken.

For example, mixed plastic is worth about \$290 per tonne whereas single type plastic – PP or HDPE can more than 2 or 3 times that amount.

If lids and caps were able to be sorted at source, then the PP could be sold for \$400 per tonne and the HDPE as much as \$800 per tonne<sup>4</sup>.

4. Values vary – estimation based on Feb 2023 data.

## Metal - Hayes Metals

Hayes Metals was asked to reprocess the metal lids and caps and provide feedback on the quality of the material, level of contaminants and desirability of community collected cap and lids as a future source of recyclate and the value such a feedstock might hold in the New Zealand circular economy.

### The Material

The metal lids and caps were sold to Hayes Metals, based in Auckland. Over the 10-week period of the pilot, 1,926kgs of metals lids and caps were collected.

There was approximately:

- 1,414 kgs of steel (Image 1)
- 553 kgs of aluminium (Image 2)

### Contamination

There was very little, if any, contamination in the metal lids and caps reprocessed by Hayes Metals in Auckland. The metal is reprocessed at such high heats that most contamination doesn't impact the process.



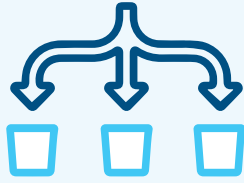
Image 1: Steel Caps



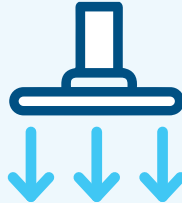
Image 2: Aluminium Caps

## Metal Recycling Process

### Stage 1: Sorting & Chipping



### Stage 2: Densification



### Stage 3: Offshore Recycling



#### Stage 1: Sorting & Chipping

- Bulk bags of lids and caps are hoisted up and tipped onto a platform.
- The caps are sorted using a magnet to sort the steel from the aluminium.
- The aluminium is then put through a second eddy current<sup>5</sup> process to ensure it is completely free of any other materials.
- The caps are then cut into smaller pieces and fall into a drum ready for transportation to the crusher.

#### Stage 2: Densification

- The streamered steel and aluminium scrap is tipped into a crusher where pneumatic cylinders compact the scrap into small blocks. The blocks are placed onto a pallet.
- Once the machine has made 18 blocks, the pallet is wrapped ready for transport.

#### Stage 3: Offshore Recycling

- The steel was shipped the steel to a smelter in Korea to turn into automotive parts and construction materials.
- The aluminium was shipped to an aluminium smelter in Europe and Asia, that will use the material to make new aluminium sheets for capsules that are used to make aluminium caps.

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5. <https://youtu.be/BuBIDn9kkY8>

### Value of metal lids and caps

While metal recyclers use magnet technology to assist in the sorting process to separate aluminium from steel, mixed bales of metal trade at reduced values where there is a high degree of mixed materials in a bale.

Where metals are sorted into single material streams, steel caps are valued at \$150 per tonne, and aluminium caps are valued at \$500 per tonne.



## 4. Pilot Incentives & Rewards

The Good Caps team recognized that many schools continued to struggle with the impacts of the Covid pandemic and resourcing capabilities during the period of the pilot. It was therefore important that the programme minimized the workload associated with participating and added value where possible. With the support of business partners, Good Caps was able to offer the following incentives and rewards to schools that took part.

### All Schools

#### Donation to each school

Each participating school received an \$800 donation and New World Gift Vouchers, which they were able to use to help incentivise their students and whanau to fully engage in the collection of lids and caps.

#### Nanogirl Labs PLD to all schools

Teachers from all of the schools were offered a Nanogirl Labs 1-hour Professional Learning & Development (PLD) workshop designed to complement the Good Caps programme. Due to resourcing and scheduling issues, three of the participating schools did not attend workshops. The 9 schools that did attend had a combined roll of 2817 students across years 1-8.

The workshops included an opportunity to demonstrate curriculum-aligned STEM experiments which use common plastic and metal items. They also facilitated discussion around the topics of sustainability, recycling, waste, materials science, and climate change.

#### Teacher Profile

The Nanogirl Labs report showed that participating teachers had on average 18 years' teaching experience and, even before the workshop, rated themselves as 'fairly confident' in teaching science. Despite this, 57% of the teachers identified that they would like the ability to add more or different science topics to their classrooms. The Good Caps programme presented an opportunity to fill this gap.

#### Impact Summary

Teachers reported that the workshop increased their knowledge of topics relevant to the Good Caps programme. There had been some confusion amongst teachers as to why they were collecting lids/caps. During the workshop, discussion about the fact that lids/caps are hard to recycle due to their small size helped to clear up this confusion. Clarifying key information at the start of the programme is important to increase teacher enthusiasm, support them in educating participating students, and increase student motivation.



#### The impact of the PLD was:

1. Increased participating teacher awareness of the Good Caps programme content, including how and why they are carrying out the activities.
2. Knowledge gains were made in topics including materials science, sustainability, and recycling, which complement the Good Caps program.
3. 88% of participating teachers intended to teach some of the workshop content in their classes, potentially leading to increased participation in the Good Caps programme.
4. Participating teachers gained awareness of how to communicate the science concepts from the workshop using everyday items, situations, and language. This is instrumental in making science accessible to primary and intermediate students.

For more information around findings of the Nanogirl Labs PLD, please see the [Nanogirl Labs and Plastics NZ Good Caps Programme Impact Report](#)

6. <https://www.nanogirl.co/>

7. 'Good Caps Programme Impact Report' - Nanogirl Labs and Plastics NZ, 2022

## Teacher Feedback

*“(Learned) about what plastics actually are.”*

Nelson Park School

*“Made me more aware of plastics and how they are made.”*

Havelock North Primary School

*“Made me more aware of plastics and how they are made. Loved the bottle tops being flattened and turned in to something new!”*

Havelock North Primary School

*“(I learned about) The recycling of caps and why they can’t be recycled with bottles.”*

Bledisloe Primary School

## Winning Schools

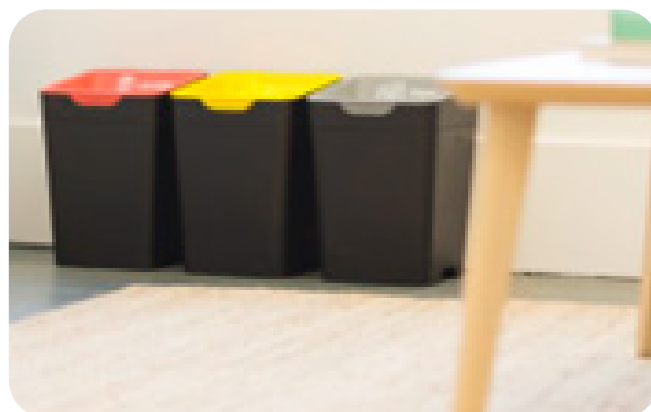
### Nanogirl Live show

The top three schools who collected the most lids and caps have won a Nanogirl Live Show. The shows were held in Term 4 2022, and focused on communicating and engaging students in science and engineering concepts. The three winning schools were: Haumoana School, St Mary’s Catholic School and Greenmeadows Primary School.



### Win Method Recycling Bins

Each of the three top three schools who collected the most lids and caps also won a set of refurbished Method Recycling bins (which are made using a high level of recycled PP Plastic, and are recyclable themselves<sup>8</sup>) for their school.



<sup>8</sup> <https://methodrecycling.com/nz/>

# 5. What did the participants think?

## Some comments from schools

### **Mark Johnson at Greenmeadows School shared his school's thoughts on the Good Caps Pilot:**

"Thanks for your continued leadership in this project - it is very illuminating, the amount of waste that can be collected and diverted from the landfill. A great lesson for the children."

However, due to resource/space constraints, they were unable to continue.

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### **Julie Polly at Tamatea Intermediate shared:**

"[Good Caps] was a real eye opener for our students."

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### **Sue Jarvis at Havelock North Primary School said that Good Caps was a perfect fit for the school's sustainability policy and its Enviroschools programme:**

"It's a real win-win for us, not only as an Enviroschools school but it's a fabulous platform for our children to show manaakitanga and as a school, to do something together to make a difference. No matter how small you are you can take action and make a difference."

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9. <https://www.rnz.co.nz/national/programmes/afternoons/audio/2018861755/hawkes-bay-school-children-collect-nearly-3-tonnes-of-lids>

## Some comments from students and their whanau

We undertook a survey of students and whanau to find out what participants thought about the Good Caps pilot. We had a very low response rate, with only five responses.

When asked if students and whanau would participate again, responses were positive:

- "I'd do this again [and stopping] these materials going to landfill is vital!"
- "To stop these things going into landfill."
- "Yes, but please Good Caps do not give out plastic bags! Crazy!"

### **Jasper (Aged 8) said:**

"Oh no!!! I was at the environment centre when I saw about five bins of tops - milk bottles, bread tags, metal lids, aluminum lids, and batteries. I was shocked. I thought, what if all this went to the landfill!"

But there was even worse stuff going on at the time. In the USA there were 2 million tonnes of rubbish going to landfill every year! So I started collecting caps. At the time I was in Year Two.

My first year doing it I put one bag in every class, and I made a poster asking children to collect caps at home. This year I made bins out of recyclable ice cream containers. When I heard about the Good Caps programme I wanted my school to support it. I started to go to cafes and restaurants to collect their caps. Sometimes they were closed but mostly they were open.

I've been doing caps for about two years. I feel good doing it. I've always wondered what a difference it might make. And I think it was cool the fact it helps Kidney Kids.

I think we should continue, even if Good Caps don't."

Jasper's enlightening korero was noticed by others. He was interviewed by RNZ and this helped to generate some media attention around the pilot too <sup>9</sup>.





## 6. A Circular Economy for lids and caps?

A key focus for the Good Caps programme is to promote the potential for circular material flows from discarded lids and caps into new products whilst retaining ongoing material value.



Image 1: Black Rubbish Sacks



Image 2: Plastic Plant Pots

### Plastic

There are already numerous products made from recycled plastic lids. Where mixed plastics are the feedstock, products such as black rubbish sacks can be produced (see Image 1 below).

**Where the material can be streamered into a single material type, other products are able to be made:**

- New lids and caps be made from recycled #2 HDPE (non-food & beverage in NZ at present)
- Cores for till receipt paper can be produced from recycled HDPE milk bottle lids
- Recycling bins can be made from #5 PP
- Designer plant pots can be made from #5 PP (see Image 2 below)

Product development for new products could develop if there was a stable material flow for plastic lids and caps available in the market.

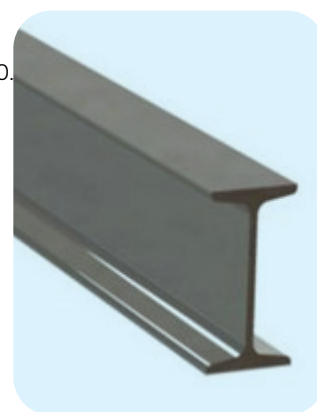


### Aluminium

Once the aluminium and steel are separated, the aluminium is then turned into small brickettes and sold as clean raw materials to secondary aluminium smelters and steel mills in Southeast Asia.

**The environmental benefit of recovering and recycling aluminium clearly justifies its inclusion in this trial:**

- Recycling 1kg of aluminium saves up to 6kg of bauxite<sup>10</sup>, 4kg of chemical product and 14 kWh of electricity.
- Recycling aluminium requires only 5% of the energy and produces only 5% of the CO<sub>2</sub>-e emissions as compared with primary production and reduces the waste going to landfill.
- Aluminium can be recycled indefinitely, as reprocessing does not damage its structure.
- Aluminium is also the most cost-effective material to recycle<sup>11</sup>.



### Steel

The recycled steel can be made into automotive parts (like steel sheets used for a car body) as well as materials for construction (e.g. steel beams and steel rebars).

**The benefits of recycling steel include:**

- It is 100% recyclable with no degradation in quality of material.
- It reduces the consumption, expenses, energy, and time to mine virgin resources.

<sup>10</sup>. Rock containing aluminium

<sup>11</sup>. (<http://www.packaging.org.nz/page/304/aluminium-cans>)





**PLASTICS NZ**

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