Environment Protection Authority

Scrap together FOGO 'Deep Dive' Education Project

Evaluation Report

Contents

Summary

The NSW Environment Protection Authority (EPA) established the FOGO Deep Dive Education Project in February 2020 to understand barriers to households using their food and garden organics (FOGO) kerbside recycling services to recover all available food waste. It followed an analysis of green-lid bin audit data that showed an average efficiency of food recovery from FOGO in NSW of 44 per cent.[1] The result was the Scrap Together education campaign, tested in three council areas between September and December 2020. It drew together evidence-based research, best-practice behavioural interventions [2] and targeted communication to increase food waste recovery by an average of 10%.

Scrap Together addressed specific and common physical, social, knowledge and attitudinal barriers to using FOGO effectively in a positive and upbeat way – including a bit of fun. It focused on residents of single-unit dwellings with existing FOGO services and primarily made use of digital communication channels.

This document provides a summary of the design approach, the resultant intervention and the measurement of its impact over a three-month period in the three council areas: Kempsey, Clarence Valley and Forbes. Links to detailed reports are given in the Appendix.

The suite of research findings and evaluation reports provides government, councils and interested parties with information that can be used to plan a best-practice behavioural intervention program. It covers project development, the value of facilitating input from subject-matter experts (council waste educators) working with behavioural specialists, and the use of social research and technical audits. The findings will be of interest for all those seeking to improve behaviours and performance of FOGO (food organics and garden organics) or food organics (only) services.

1 Analysis of NSW Kerbside Green Lid bin Audit Data https://www.epa.nsw.gov.au/-/media/epa/corporate-site/resources/wasteregulation/fogo/green-bin-audit-2011-19.pdf?la=en&hash=EB4E21B1748BA82B6DF56EAF9B5A347372776946

2 Developed by BehaviourWorks Australia https://www.behaviourworksaustralia.org/the-method/ and with similarities to community-based social marketing, a behaviour-change approach the NSW EPA has supported councils to use in previously

The intervention's development and evaluation included:

- a baseline of community behaviours and attitudes from an online survey of 2,654 residents across NSW who have a weekly FOGO service and do not share bins with other households (Micromex 2020)
- insights from councils that have existing FOGO services. The EPA set up a working group comprising FOGO educators from councils across NSW. Three facilitated workshops explored the findings of the baseline social research and bin audits, and narrowed the project focus to specific behavioural and attitudinal interventions (BehaviourWorks Australia 2020)
- pre- and post-intervention matched pair, bin-by-bin audits of 660 households (APC 2021) and pre- and post-campaign visual inspections of FOGO and residual waste bins at 1,400 households
- development of Scrap Together campaign creatives and a suite of collateral to be rolled out across the three council areas
- a post-intervention online survey of 387 residents in the three council areas (Micromex 2021).

The EPA required the pilot councils to deliver a common set of communication activities , plus additional actions detailed in a tailored communications plan. Councils were provided with the Scrap Together creative collateral and were supported by the EPA in tailoring the template communications plan so that it reflected their individual communities and context (e.g. if they needed a supply of compostable caddy liners or not). Monthly group meetings between EPA and the councils enabled participants to share experiences.

COVID-19 constraints meant that councils were unable to undertake the level of direct face-to-face engagement they had planned, so changes in behaviour and attitudes were largely the result of indirect and digital engagement.

Key Findings

Bin audit findings

Comparison of the results from pre- and post-intervention bin audits (n=660, comprising 220 matched pairs from single-unit dwellings in each LGA, pre-and post-intervention) showed the following findings.

More food was recovered in the green-lid bin

The proportion of food waste put into the FOGO bin rather than red-lid bin demonstrably increased in all three council areas by an average of 10%. One council saw a 13% increase, one an 11% increase, and the third a 6% increase.

Deeper participation

The number of high-performing households (placing 80–100% of food waste in FOGO bin and 0–20% food waste in the red bin) increased from 264 to 315, and the number of low–performing households (0–20% food waste recovery) decreased from 234 to 201.

Total amount (by weight) of food waste generated decreased[3]

The bin audits also showed an average 8.46% reduction in the amount of food waste generated. Further research will be required to understand the factors behind this reduction. It may indicate that the campaign had the unintended benefit of also supporting food waste avoidance behaviours, reflect seasonal change in generation rates, or be the result of an increase in alternative methods of managing food waste (such as home composting or feeding scraps to pets).

Whatever the factors, the outcomes were that the total weight (kg/hh/week) of food presented at the kerbside (in the red-lid and FOGO bins) from the same household decreased by 1%, 9% and 15% in the three council areas.

Less food was found in the red bin after the education campaign

After the intervention, households across the three councils disposed of an average of 26%, 36% and 49% less loose food (by weight) in the general red-lid waste bin and 18%, 34%, and 3% less packaged food (APC 2021).

3 In this audit, presentation (measured by weight) is used as a surrogate for generation of food waste.

Social research findings

The post-intervention online survey (Micromex 2021) found the campaign was successful in increasing awareness and understanding, changing attitudes and behaviours in all three council areas.

The specific campaign messages/calls to action, each of which addressed a specific behaviour or aimed to reinforce knowledge, resonated well.

Increased recovery behaviours

The proportion of residents reporting that they disposed of food scraps into the green-lid FOGO bin increased significantly from 64% to 72%.

Reported disposal of food waste into the green-lid FOGO bin increases significantly with repeat exposure to the education campaign.

FOGO users who stated they place a greater proportion of food scraps in the green-lid bin, said the main reasons were, it is good for the environment and that they now have a better understanding of what foods can be placed in the FOGO bin.

Reduction in concerns

Fewer households (45%, down from 52%) nominated one or more major concerns about FOGO after the campaign. Those concerns significantly declined with increased exposure to the campaign (50% for those who had not seen the campaign but significantly down to 34% for those seeing it six or more times). Households reported the remaining major concerns were only between 3 and 15 per cent likely to substantially impact on how much food waste they put into their FOGO bin.

Behaviours around targeted food items

Of 10 specified food items/groups, less went into the red bin and more went into the FOGO bin.[4]

Residents reported placing fewer items into the red bin (on average, a decrease from 2.4 to 2.0 items). Conversely, the number going into the green-lid bin increased (from 4.5 to 5.6 items).

Implications for other NSW councils

The councils greatly appreciated receiving the high-quality assets and evidence-based messages/calls to action informed by deep research, particularly as one council had no previous dedicated FOGO education campaign and another was ready to refresh a successful but decade-old campaign.

Social research and bin audit data show that the three councils that ran the Scrap Together campaign are typical of existing NSW FOGO councils. Results are therefore likely to be replicable in other council areas.

The three councils each delivered the campaign with:

- $10,000 assistance per council from the EPA
- an average in-kind investment of a 0.5 day a week for three months
- a financial investment of less than $1,000 per council.

4 The 10 items/groups were: meat; fish and other seafood; scraps and bones; fruits/vegetables; bread and pastry products; pasta, rice, etc.; pantry long-life packaged foods; dairy products; takeaway/home delivery food; left-over cooked foods.

Introduction

Context

The NSW Government's *Net Zero Plan Stage 1: 2020–2030* is the foundation for NSW's action on climate change and the roadmap for reaching net zero emissions by 2050[5]. This plan will help the state cut emissions by 35% (compared to 2005 levels) by 2030. The target for organic waste is net zero emissions after 2030 from landfilled food, garden waste and textiles. The key to reaching this will be to increase both access to organics collection services and the effectiveness of these services in diverting organics from landfill.

This project is one of several strategies to optimise the NSW Government's investment in organics recycling under the $105.5 million *Waste Less, Recycle More* Organics Infrastructure Fund.

Rationale for education campaign

The project was prompted by research showing that NSW residents with a FOGO service were not using it to the fullest extent and that a lot of food waste was still being disposed of in the red-lid landfill bin. The project aim was to undertake further research to identify and test an intervention that would be most effective in improving green-lid bin performance.

In early 2020, Rawtec updated its FOGO bin audit analysis for the EPA, analysing data from 38 NSW FOGO audits on the diversion of food and garden material in absolute amount (kg/hh/wk), the diversion efficiency (percentage of material diverted via the FOGO system), and contamination levels.[6]

The analysis found:

- an average 44% diversion rate of available food waste (up from 38% from a previous analysis in 2018)
- considerable variation in diversion rate, of between 5% and 78% (0.17–7.3 kg/hh/wk)
- the optimum bin configuration: a 240-litre weekly FOGO and 120-litre fortnightly red (residual waste) collection, which yielded an average 57% diversion[7]
- low contamination rates, averaging 2.2% by weight
- considerable variation in contamination rates, from 0.04% to 17.83%.

Bin-by-bin matched red-lid and FOGO bin analysis showed a significant proportion of households had no food waste in their FOGO bin. This proportion varied greatly, from 27% to 70%.

The wide variation in diversion and participation rates called for further research into the barriers and challenges to better performance, so that interventions can be designed better to address them.

5 https://www.environment.nsw.gov.au/topics/climate-change/net-zero-plan

6 Rawtec 2018 and 2020 reports are available at https://www.epa.nsw.gov.au/your-environment/recycling-and-reuse/business-government-recycling/food-organics-and-garden-organics

7 Bin configuration alone is not the answer: among the councils with 240-litre weekly FOGO bin and 240-litre fortnightly red bin collection, one had a food efficiency of 5% and another, a food efficiency of 78%. Length of service also made a difference, as did community awareness.

Method

This section covers the process by which an education campaign was selected through co-design and how it was tested and delivered.

Baseline social research

To understand why households weren't using the green-lid bin to best advantage, the EPA contracted Micromex Research to conduct a baseline social research survey (Wave 1) between 17 April and 10 May 2020 with 2,654 residents from 26 different local government areas (including regional, rural and metropolitan councils) that provide residents with a weekly FOGO bin.

The research sought to explore:

- awareness and understanding of existing FOGO services
- attitudes towards the current FOGO service
- current behaviours around food waste
- perceived benefits of a FOGO service
- communication and engagement around waste and recycling with a focus on the recycling of food scraps.

The findings from Wave 1 (see Results section of this report) informed the design of targeted education messages for the campaign and gave program planners rich insights into many aspects of bin-use behaviour (i.e. not just concerning the green-lid bin).

Using a co-design approach with councils

The project had two phases:

- The EPA first engaged with staff from all FOGO councils, inviting their feedback on the proposed project and their contribution to its subsequent development.
- BehaviourWorks Australia (BehaviourWorks) then facilitated a three-part co-design process (three 90-minute online workshops on successive days) for the council subject matter experts and the EPA to
  - dive into the data
  - explore common drivers for using FOGO for food scraps, and common barriers
  - brainstorm intervention messages to address drivers and barriers
  - brainstorm message sequencing.

Timeline 2020 Education Intervention

Date	Activity
February	Working group formed with FOGO educators
April/May	Baseline survey of 2,654 residents across 26 LGAs with established weekly FOGO services
May	3 X BehaviourWorks workshops to design intervention and messaging
May	Three councils nominated to test the intervention
July/August	Campaign concepts and collateral developed
August	Baseline audits and visual bin inspections at three councils
Sept, Oct, Nov	Intervention goes live
December	Post intervention audits and visual bin inspections
December	Post intervention audits

The BehaviourWorks approach took the council subject matter experts through the following steps.

Session 1: understanding and identifying

- Understanding the system or problem (using results from the EPA-commissioned Micromex research)
- Identifying priority behaviours
- Understanding the positive and negatives influences on the priority behaviours i.e. barriers and drivers to recycling of food waste

Session 2: deep dive part 1 developing intervention options

- Developing intervention (messaging) options for each of the four prioritised behavioural actions

Session 3: deep dive part 2 developing intervention options

- Design and sequencing of messages
- Focusing on one priority behaviour, its key barriers and associated intervention messages, sequencing and specifying activities to deliver the intervention message. This was done in groups – each working on an intervention for the three participating councils.[8]

BehaviourWorks Australia refined the draft designs further, such as by:

- distinguishing primary and secondary activities based on direct influence and estimated reach/impact
- matching the messages/solutions to appropriate channels.[9]

Table 1 Identified barriers to optimal use of FOGO bin and associated solution (EPA)

Identified barrier	Associated solution
Lack of knowledge that FOGO can take all food types (unlike home composting)	• **Action:** Examples of what can be put in FOGO bin – dairy, bones, packaged foods (once removed from packaging)
Lack of understanding of the benefits of FOGO (FOGO for farms) – environmental message	• **Awareness:** How food scraps are turned into quality compost and how it improves soil health, drought resilience and increases yield for local farmers • **Action:** Encourage residents to put all food scraps into the green-lid bin
The 'yuck' factor, including fear of attracting pests/ smells	• **Action:** highlight proactive actions to prevent yuck e.g. wrap it and chuck it out quickly, keep bin in shade, wash bin
'Every bit counts' – don't just put in food preparation scraps but also scraps when cleaning up after meals and when cleaning the pantry or fridge	• **Action:** Separate all food scraps all the time (not just when preparing meals) and remove from packaging – keep it clean – no plastic in the FOGO bin • **Action:** show how quick and easy it can be • **Action:** Evidence of compost being used in the community

8 Each step of the BehaviourWorks process included refinement and synthesis of workshop outputs by BehaviourWorks specialists between the sessions with council subject matter experts.

9 See Appendix for BehaviourWorks report.

The resulting communications plan and collateral

Following the co-design process, the EPA prepared the creative brief and commissioned the design and production of the core campaign assets. Three core issues were addressed.

Table 2 The three core issues, messages, behaviours to be modelled and video titles

Issue/barrier (actual/perceived)	Need to tell	Response message	Video title
Not knowing what happens to contents of the FOGO bin (FOGO to farms)	Where FOGO goes and why • How FOGO gets turned into compost • how FOGO compost helps regenerate agricultural land How healthy soils grow healthy food	Food scraps are professionally made into compost and used by farmers to improve soil and grow good food. It's circular. For residents it starts with the green bin. Good land needs good soil. Good soil needs good compost. Good compost starts with the green bin. And you.	'Every Scrap Matters'
Every bit counts Demonstrating how the FOGO service takes everything. It's a comprehensive service	FOGO bin takes all food scraps: Fish, dairy, meat, etc.	Reflects the NSW community members doing their bit – getting their scraps (including fish, meat & dairy) sorted by using the bin for all their food scraps, and either wrapping the scraps (in paper) or cleaning the bin now and then	'Scrap Sorted'
The yuck factor	Users have various different tips and tricks: Put your green bin in the shade, empty caddy daily, put caddy in dishwasher, etc.	Shows options for wrapping/not wrapping Shows there are many ways residents keep their bins and caddies clean and pleasant while still collecting all food types (including freezing smelly scraps)	'Scrap Load Better'

The three 45-second video clips, as well as the static material in the Scrap Together education campaign, each contained key messages addressing one of the three themes above.[10]

The collateral suite contained the following:

- three 45-second video clips
- 15-second cut-downs of all clips
- radio clips for all three videos for three councils
- social media posts (with the intention of boosting via geotargeting on social channels)
- a toolkit of images, video, templates for blogs and interviews, stickers, signs, social stickers and flyers
- media release templates – local farmers interviewed by local media, local FOGO champions
- a template communication plan.

10 Assets provided included three video clips, social media posts, a toolkit of images, templates for blogs and interviews (that NSW EPA assisted with tailoring for local conditions/context), stickers, signs, social stickers, flyers and media release templates.

The videos reinforce the messages that the contents of people's FOGO bins is turned into professionally made compost, that every scrap is wanted, that your bin takes ALL food including bones, fish, meat and dairy, and that there are several ways people keep their caddies and bins fresh.

The EPA worked with each council to develop a plan on how to use the supplied collateral and add local delivery mechanisms and collateral nuancing the outputs from the BehaviourWorks session to maximise relevance of the local education campaign within each community while ensuring that they all remained 'on message'.[11]

Participating councils and NSW wide relevance

The three councils that volunteered to pilot the education campaign were Clarence Valley, Kempsey Shire and Forbes Shire councils.

Households in each of these local government areas (excluding rural properties) receive a weekly FOGO bin collection service and a fortnightly general waste service. Households also receive a fortnightly collected co-mingled recycling bin. All councils run their own landfills. Two councils allow use of compostable kitchen caddy liner bags but one does not.

As the intention was for both the approach and learnings from the campaign to be made available for all NSW FOGO councils, the demographic profile of the three councils was compared with the collective profile of 23 other NSW councils that have weekly FOGO (see the Micromex Wave 2 report, 2021). See Discussion section for further comment about the council profiles.

Baseline audits and visual bin inspections

Bin-by-bin (220 matched pairs of red and FOGO bins of single unit dwellings) audits were undertaken in each of the three councils immediately before the campaign started.

The matched-pair audit method was used to specifically investigate individual household behaviour regarding food waste generation, consumption and comparative use of the two bins for food waste disposal. The yellow recycling bin was not audited.

Additionally, the councils were requested to undertake a sample of visual (lid lift) inspections of households that presented red and FOGO bins. Bin lids were lifted and the top 25 cm of contents stirred with a stick. Records were made of any food waste observed in the red-lid bin, and loose food, wrapped food and food in compostable bags in the FOGO bin.[12]

Depending on available resources councils either trained and used council staff for this exercise or engaged local contractors. The visual inspections were undertaken for 2–5 hours/day for five days. Over 1,400 visual inspections of matched pairs of bins were conducted before and after the campaign. This data was used to increase the sample size for assessing changes to participation/use of the FOGO bin where households generated food waste.

Intervention

Recognising that each council may run its communications and education campaigns differently, the EPA Organics team provided $10,000 per council. With that funding, each committed to run the three-month education campaign in their LGA from September to November 2020.

Core elements of the communications to be delivered under the arrangement were (at a minimum):

- 1–2 x video/stills posts a week on council Facebook page (EPA provided assets)
- 3 mailbox drops (EPA provided)
- 3 local media story/advertisement (EPA provided assets for advertisement and councils could make minor modification)
- 2 case studies in newsletters, mayoral letters, council message, council website
- 1 event about the FOGO service.

11 See, for example, Forbes Council, which does not allow bags in the FOGO bin https://www.forbes.nsw.gov.au/residents/waste-and-recycling/food-organics-garden-organics.

12 Audit methodology provided by the NSW EPA

Councils were also encouraged to develop bespoke content and use additional channels in their education campaigns. Suggested tactics were:

- radio promotion
- television promotion
- social challenges with incentives (EPA provided ideas, including bags of compost as incentives)
- social media conversation starters, where peer-to-peer education and conversations were encouraged
- asking the community to provide leads for case studies through social media activation
- council garden using compost from local FOGO
- weekly task ideas for the eco-friendly kitchen.

The education campaign was delivered across social media (with paid boosts), television, radio and council rates notices, for three months. After the education campaign technically finished in December, councils continued to run it with a bus sides decal added in Clarence Valley and a waste truck decal in Kempsey. Costs (where available) are included below as an indication of what can be done with the available budget.[13]

APC and Micromex then conducted post-intervention bin audits and social research in the three participating council areas, and the councils conducted a further 1,400 visual bin inspections.

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13 Reports on actual placement, cost, reach and impact of education campaigns were unavailable for this report. The listed actions are drawn from councils' communication plans and interviews with the councils three months after the end of the education campaign: they should therefore be taken as indicative.

Results

This section of the report contains the results of both the pre-intervention and post-intervention studies so that readers have an idea of the context for the intervention and its subsequent impact. More detail is available in the separate audit and social research reports, which together tell the story of reported attitude, knowledge and behaviour change and impacts in the bins.

Pre-intervention social research highlights

Three key barriers to effective use of FOGO service

The Micromex research identified three key barriers across the NSW community to effective and efficient use of the FOGO service:

- not knowing what happens to the contents of the FOGO bin
- not knowing that all foods can go in the FOGO bin
- the 'yuk factor': potential mess/smell, not being sure about the caddy, etc.

Importantly, with the suite of research informing it, the *Scraps Together* education intervention addressed these three key barriers from angles that would work right across the NSW community, rather than targeting specific demographic groups.

Demographic insights

The Wave 1 Micromex report contains detailed social insights on issues including on

- bin behaviours
- sorting practices for food scraps
- glass jars and bottles
- paper and cardboard
- beverage containers
- garden waste
- soft plastics

along with insights into practices around takeaway/home delivered food and its containers, and into the 17% of households that were putting a high proportion of food scraps in the red bin instead of the FOGO bin.

Baseline attitudes and bin use

Awareness, knowledge and the potential for change

Micromex found a link between (low) household awareness of the ability to place food in the green-lid bin, (low) awareness of FOGO outcomes, and the household's potential future action. Making people aware of specific FOGO outcomes such as

- 'Your green-lid bin is a comprehensive compost service which can process virtually all food scraps including bones and other animal products'
- 'Food and garden waste in your green-lid bin is turned into compost'
- 'In many parts of NSW, we are running out of landfill space for red-lid bin waste'

tended to elicit a more favourable response from those who were not aware of FOGO outcomes than generic messages such as 'Putting food and garden waste in the green-lid organics bin is good for the environment'.

Respondents who were aware of their FOGO service, but reported putting any food into the red-lid bin, were invited to say why: The top three reasons were:

- only small amounts are going in for reasons such as contaminated packaging, spoiled food, or too little food waste to bother sorting
- it was easier/more convenient, or they forgot
- food made the green-lid bin messy and smelly.

Regarding dislikes and challenges:

- 47% of respondents had no challenges or dislikes about the FOGO bin service
- 24% disliked or found it challenging to deal with the smell/mess/mould of food waste
- 13% complained about flies/vermin.

These challenges or dislikes may or may not affect whether respondents use the service but are likely to affect whether they use it optimally.

The food types most frequently placed in the red-lid bin instead of FOGO were bones, dairy, fish/seafood and meat.

Post-intervention social research findings

A post-intervention survey of 387 residents in the three councils (Micromex, December 2020) assessed residents' responses to the education campaign (including their level of exposure to the campaign) and identified potential shifts in attitudes and behaviours.[14]

It found that the education campaign was successful in increasing awareness and understanding, changing attitudes and behaviours. Emotional involvement with the education campaign was high.

Two-thirds who had seen/heard the education campaign said it was 'very likely' that their food waste behaviours would be positively influenced as a result of the education campaign. This commitment rate increased when people were exposed to the campaign five or more times.

Finding: Attitudes and reported behaviour changed

This section is arranged to address the three knowledge gaps, but the nature of the data means several of the findings/results speak to more than one gap.

Not knowing what happens to the contents of the FOGO bin – 'Every Scrap Matters'

Sixteen per cent (16%) of respondents report putting more food scraps in the green-lid bin now than they did six months earlier.[15]

The main reported contributing factors were:

- that they now have a better understanding of what foods can be put in the green bin (59%)
- that it is good for the environment (59%)
- that they now know how to avoid food scraps smelling (25%)
- that it is good for our farmers (18%)
- because they are not composting so much as they used to (12%)

While Micromex advises that the sample size was too small to make a meaningful direct impact link between the education campaign and the behaviour change, they note that 82% had seen the education campaign and therefore highlight its influence on their action.

Not knowing that all foods can go in the FOGO bin – 'Scrap Sorted'

Awareness that that all food scraps can be placed in the green-lid bin increased significantly

- The percentage in the 'quite aware' and 'very aware' groups shifted from 77% to 81% after the education campaign. The 8% increase at the top rating of 'very aware' indicates that exposure to the education campaign shifted a cohort's awareness from 'quite' to 'very aware'.
- At the other end of the spectrum, respondents who were 'not at all aware', 'didn't know', 'not really aware', or 'weren't sure' also reported that they were now more aware that all food scraps can go into the FOGO bin.

Significantly more respondents (72%, up from 64%) reported placing their food scraps in the green-lid bin and paper and cardboard in the yellow bin.

The level of reporting of behaviour change increases significantly with those who have had repeated exposure to the education campaign.

Volume (assessed by number of specific food items from a list of 10) of food going into the red-lid bin declined and into the green-lid bin increased.

Residents reported placing fewer items into the red-lid bin (decrease from average of 2.4 to 2.0 items). Conversely, the number going into the green-lid bin increased (from 4.5 to 5.6). This self-reported behaviour change was confirmed by bin audits and visual inspection data.

One of the main **reasons given for making the behaviour change cited was that they now have a better understanding of what foods can be placed in the green bin**

14 The post-intervention survey was online and opt in. Respondents were recruited via council promotions, Micromex's online community panel (for Kempsey Shire) and number harvesting. The post-intervention sample size means that each LGA is not equally represented by one third of the sample and no weighting is applied. We therefore recommend that the findings be taken as a whole cohort.

15 Eleven per cent (11%) reported placing less in the green-lid bin and 73% about the same amount..

The 'yuk' factor: not being sure about the caddy, potential smell, etc. – 'Scrap Load Better'

Increased exposure to the education campaign brought about a significant decline in the nomination of concerns about, or issues associated with, FOGO, as well as respondents reporting that any remaining concerns were unlikely to negatively impact the amount of food waste they put in FOGO bins.

This implies that the campaign was successful in addressing the 'yuk factor' even though direct recall of the related messages was relatively low at 21%.

Significantly, 7% fewer respondents overall (45%, down from 52%) expressed a major concern about putting some or all their food scraps into the FOGO bin. And the higher the exposure to the campaign, the lower the concern. Of those not exposed to campaign, 50% had at least one major/big concern; of those exposed 1–5 times to the campaign, 48% had such a concern; and of those exposed 6+ times to the campaign, only 34% had a concern.

Finding: High emotional involvement with education campaign

Micromex advises that while direct/blunt questions do not predict actual behaviour, they are useful for providing a sense of respondents' emotional reactions to a campaign.

Two-thirds of those who had seen/heard the education campaign said it was 'very likely' that their food waste behaviours would be positively influenced as a result.

Commitment increased with exposure rate: it was 60% for those exposed 1–5 times and 73% for those exposed 5+ times.

Micromex identified the correlation between repeated exposure to the education campaign and increased commitment to being 'very likely' to act.

Finding: Appealing messages and recall

Message appeal

What encouraged residents to act? The 'All food scraps can go into the green-lid organics bin' message received the highest 'appeal' score (48%) followed by 'putting your food scraps in the green-lid bin is great for farmers and the environment' (42%).

Message recall unprompted

In their own words, the main messages respondents reported taking from the education campaign were

- Better for the environment. This was also the response to an open-ended question asking why some respondents were now very likely to put food scraps in the green bin as a result of the education campaign. This tells us that the residual message landing with the community was about being 'better for the environment' whichever way it had been articulated.
- Reducing waste to landfill
- Sort waste correctly/know the right bin. Micromex suggests recall of this message may relate to the tag line 'we've got our scrap sorted'.

Most common media channels

Social media channels (Facebook), TV adverts and council websites were the most common media channels recalled for seeing/hearing the education campaign.

This may be pertinent for prioritising council investment in different education campaign channels, but Micromex advise designing a campaign using mixed channels for the most effective reach and market penetration.

Finding: Benefits of repeat exposure to the education campaign

Overall, 61% of households recalled seeing or hearing the campaign. Reach was highest in Forbes (91%), followed by Kempsey (55%) and Clarence Valley (50%) council areas. Frequency of exposure was also highest in the Forbes LGA (53% had seen/heard the campaign 6+ times, compared to 23% in Kempsey and Clarence Valley).

The **repeat exposure appeared to increase message retention**. Amongst those who had seen/heard the education campaign only 1–5 times, 18% couldn't recall a message but for those who had seen/heard the education campaign six or more times that inability to recall dropped to only 6%.

Those that had seen the education campaign six or more times were also more likely to state the main ideas communicated in the education campaign were 'better for the environment' and to 'reduce waste to landfill'.

Post-intervention: Findings from the bin audits

Recovery of food waste increased

The proportion of food waste put into the FOGO bin rather than the household's general waste red-lid bin (i.e. diversion efficiency) clearly increased at all three councils. One council saw a 13% increase in the transfer of valuable food organics from general waste to the organic bin, one an 11% percent increase and the third a 6% increase.

> Food waste presented at kerbside reduced at all three councils
>
> – APC report

Table 3 Food recovery

Measure	Clarence Valley	Forbes	Kempsey	Overall
Audit 1	69%	62%	72%	68%
Audit 2	82%	68%	83%	78%

Disposal of food in the general waste bin decreased

Following the three-month education campaign APC found that households disposed of less food (both loose and packaged) in the general waste bin.

Averaged out, households across the three councils disposed of between 26% and 49% less loose food in the general waste bin per household and 3–34% less packaged food (APC bin audit estimate) after the intervention.

Table 4 Loose food in general waste

Measure	Clarence Valley	Forbes	Kempsey	Overall
Audit 1 – total food waste in general waste bin generation (kg/hhld/wk)	0.78	0.8	0.6	0.72
Audit 2 – total food waste in general waste bin generation (kg/hhld/wk)	0.40	0.6	0.4	0.45
Change by weight (kg/hhld/wk)	-0.38	-0.2	-0.2	-0.27
Change by percentage	-49%	-26%	-36%	-37.5%

Table 5 Estimated packaged food content in general waste

Measure	Clarence Valley	Forbes	Kempsey	Overall
Audit 1 – total generation (kg/hhld/wk)	0.4	0.6	0.4	0.49
Audit 2 – total generation (kg/hhld/wk)	0.4	0.5	0.3	0.40
Change by weight (kg/hhld/wk)	0.0	-0.1	-0.1	-0.09
Change by percentage	-3%	-18%	-34%	-18.4%

The number of households moving into very high FOGO recovery rates (80–100%) also increased at all three councils.

Table 6 Households moving to very high FOGO recovery rates

Measure	Clarence Valley	Forbes	Kempsey	Overall
Audit 1 – no. households moving to very high recovery	88	74	104	
Audit 2 – no. households moving to very high recovery	108	99	104	
Percentage of households moving to very high recovery	26%	34%	4%	

Similarly, the visual inspections of 1,400 households' paired bins also found a decrease in the number and percentage of households putting food waste in the red bin following the education campaign.

Disposal of food in acceptable manner increased

Following the three-month education campaign there was an increase of accepted food (i.e. accepted by the facility because it is presented loose, wrapped in newspaper, or put into compostable bags and placed in the FOGO bin for recycling).

Table 7 Accepted food in FOGO

Measure	Clarence Valley	Forbes	Kempsey	Overall
Audit 1 – accepted food waste in FOGO bin (kg/hhld/wk)	1.7	1.3	1.5	1.51
Audit 2 – accepted food waste in FOGO bin (kg/hhld/wk)	1.9	1.2	1.8	1.64
Change by weight (kg/hhld/wk)	0.1	-0.1	0.3	0.13
Change by percentage	8%	-8%	23%	8.6%

Visual bin inspections found a higher proportion of households with food loose, wrapped in newspaper or contained within compostable bags within FOGO bins after the education campaign. There was also an observed decrease in food in non-complying containers within FOGO bins.

Generation of food waste decreased

In this study, presentation of food waste at kerbside is used as a surrogate for generation of food waste. Generation of loose food decreased in two LGAs and increased in one, but when the amount of food waste in packaging was also considered generation decreased in all three LGAs.

Table 8 Total loose food generation waste presented at kerbside (i.e. in both FOGO bin and red bin)

Measure	Clarence Valley	Forbes	Kempsey	Overall
Audit 1 – total generation (kg/hhld/wk)	2.5	2.1	2.1	2.24
Audit 2 – total generation (kg/hhld/wk)	2.3	1.8	2.2	2.09
Change by weight (kg/hhld/wk)	-0.3	-0.3	0.1	-0.15
Change by percentage	-10%	-15%	6%	-6.7%

Notes

A negative figure is a reduction in weight or percentage of loose food waste presented at kerbside.

While reasons are unknown or unverifiable, Kempsey speculates that the increase in their LGA might be a result of the early influx of holiday makers.

Table 9 Total food waste presented at kerbside (loose and estimate of packaged, in both FOGO and red bin)

Measure	Clarence Valley	Forbes	Kempsey	Overall
Audit 1 – total generation (kg/hhld/wk)	2.9	2.8	2.5	2.72
Audit 2 – total generation (kg/hhld/wk)	2.7	2.3	2.5	2.49
Change by weight (kg/hhld/wk)	-0.3	-0.4	0.0	-0.23
Change by percentage	-9%	-15%	-1%	-8.46%

Note

Kempsey 1% is rounding.

Contamination decreased

Overall, contamination rates across the three councils decreased from 3.2% to 1.4%. Packaged food found in the FOGO bin decreased from 0.3% to 0.2%, and other contamination decreased from 2.6% to 0.5%. However, there was a small increase food in takeaway containers (from 0 % to 0.2%) and food in plastic bags (from 0.3% to 0.5%).

The visual inspection found an increase in the use of white caddy bin liner bags. It was later discovered that these are a certified compostable bag available at the local supermarket. During the bin audit sorting process this information may not have been available and compliant bags may have been incorrectly measured as plastic bag contamination.

The experience for participating councils

Each of the councils was keen to take part in the project. One was ready to start a new education campaign after 10 years of running a successful, popular education campaign. Another had not had the opportunity to run a FOGO education campaign in the four years since its service started. Of particular benefit was the fact that the education campaign materials were high quality and 'ready to go'.

Technical support from the EPA, the provision of capacity building through the BehaviourWorks sessions, and ongoing networking were all noted and appreciated.

While all councils worked effectively with their communications teams, all acknowledge that a coordinated approach across their regional waste groups for the media placement (and EPA reporting) would be a useful and probably time-efficient tactic.

None of the council officers had delegation for council's social media accounts. This meant that all had to work closely with, and were dependent on, their communications team (two of whom were short-staffed during the education campaign which may account for the difference in the depth/breadth of the education campaigns in the three councils). The support of enthusiastic communications staff who support and see the education campaign as being a 'council' education campaign is key.

Two of the councils found the requirement to organise and run visual bin-lid audits onerous. All spent five days in the field. One spent time training casual staff from their waste facility, one put together a team from other council departments and one contracted audit professionals.

Clarence Valley reflected on the loss of regional newspapers this year, and that councils traditionally depended on these for reaching community members, and so now need to think and work differently to engage with the residents. This education campaign shows how it can be done.

While all had intentions of supplementing the education campaign with various face-to-face events, COVID-19 aside, councils also had to deal with floods during the campaign.

> It was fantastic to have such high-quality resources produced by the EPA and ready to roll-out.
>
> – Clarence Valley Council

Recommendations from the councils are to increase the duration of future education campaigns. All are continuing to use elements of the collateral (including making truck decals) insofar as they are able to with existing budgets and work responsibilities.

All are keen to continue the education campaign and expand it when funding allows.

Discussion Points/Learnings

1. Food waste avoidance

Considering the education campaign messages were not targeting avoidance of food waste, the overall decrease in the **quantity** of food waste presented (red/FOGO bin) is a very welcome outcome.

However, the research doesn't identify a direct cause–effect relationship, so it could indicate an increase in waste avoidance behaviours, a seasonal change in generation rates (summer), or an increase in the use of alternative methods such as home composting or feeding food scraps to pets.

2. Audits, data and depth of evidence

Evaluation of the intervention clearly indicates that the approach has been successful in addressing the target behaviours and specific types of food scraps and has had the desired diversion impact. However, while the matched-pair method approach provides robust data around generation, recycling and disposal, matched-pair audit results may not be strictly representative of the entire council area and so shouldn't be read as such. For example, households not putting out red-lid bins (perhaps due to low residual waste generation) and/or households not putting out their FOGO bin were not sampled, while those households putting out the FOGO bin with just garden waste were sampled. Similarly, the insights to attitudinal and reported behaviour change in the communities are based on opt-in responses and a smaller sample size so despite positive indications and valuable insights for all FOGO interested parties, the social research results cannot be taken to be representative of the whole community in the participating councils.

3. Demographics

The education-campaign councils have:

1. a higher percentage (29%, 29%, and 30%) of lone-person households than the collective profile (26%) of the other 23 councils with established weekly FOGO services surveyed as part of the baseline social research
2. a lower percentage of families with children under 15 (25%, 30%, 23%) than the 32% for the collective profile

> There are some demographic and attitudinal/behavioural differences between the three pilot LGA's and the other 23 FOGO LGA's [which were all included in the pre-education campaign social research] our sense is that the education campaign, with sufficient media weight/media mix, should also be effective in these other FOGO LGA's.
>
> – Micromex (2021)

3. a lower median total weekly income
4. variations in median age, with two of the three councils having a higher median age than the collective FOGO profile (42.6).

In addition, all households surveyed were single dwellings.

So, while the demographics of the education campaign councils are indicative of a broader sample, there are some differences.

4. Variation between households

While the *Scrap Together* campaign increased food diversion efficiency and use of the FOGO bin, the percentage of food waste recovery is still polarised, with most households putting either less than 20% or more than 80% of kerbside presented food waste in their FOGO bins. The pre-campaign Micromex 2020 report characterised the households using the red-lid bin for most of their food waste as 18–44-year-olds, with young children, new to the LGA and with low levels of awareness that the green-lid bin is not just for garden waste. The sample size was too small in the post-campaign survey to characterise the group that remained as high red-lid bin users for food waste. The increasing number of households with no food waste in kerbside bins is an important consideration for measurement and evaluation of FOGO participation and efficiency projects.

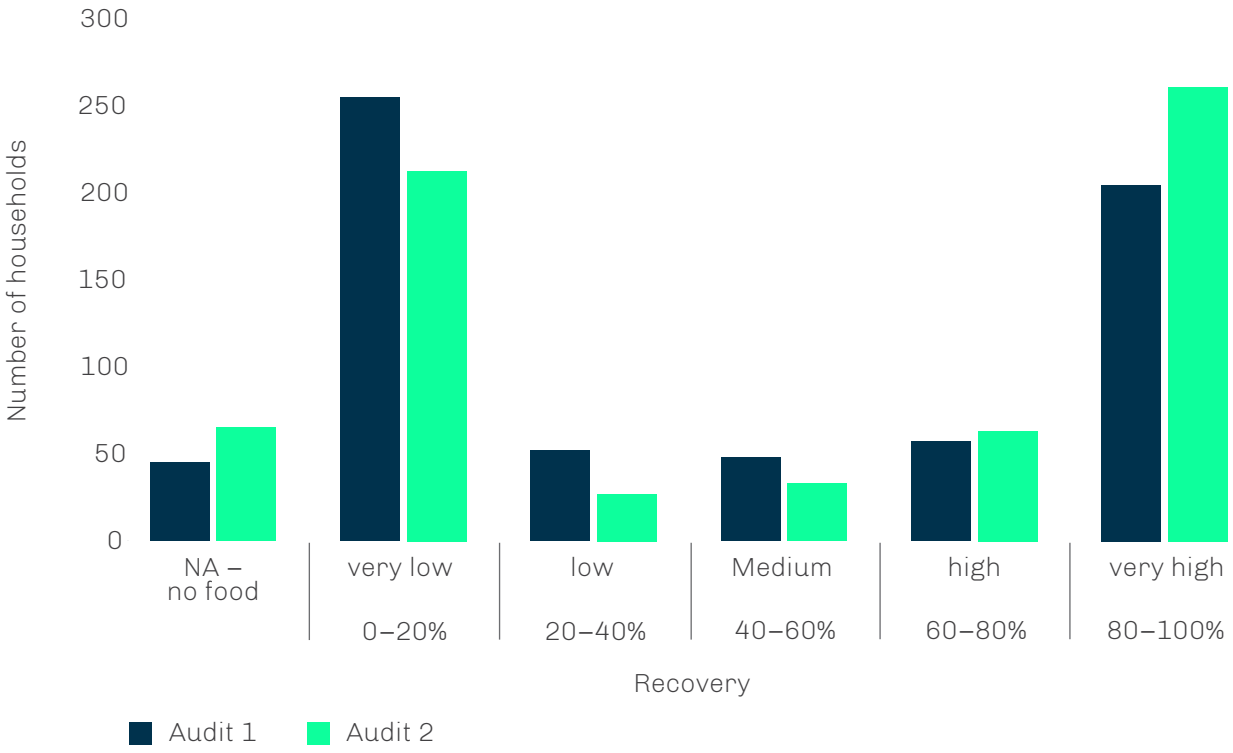

Figure 1 Food recovery distribution levels across audited households. Source: APC audit report

5. The education campaign:

The evaluation was conducted after the campaign had been live for three months. Stakeholders recommend a 3–6 month campaign in future, because:

- the councils had a relatively short lead-in time
- with their multiple responsibilities (including for some running a FOGO communications campaign for first time), reduced staffing capacities, and COVID-19 responses to manage, communications and waste experts may have still been on the ramp-up phase at the campaign's intended mid-point; and, most importantly
- the data indicates that the greater exposure the greater the engagement (attitude, recall and action).

6. Project Management

The results reinforce the value of working with subject matter experts – in this case the council waste managers and BehaviourWorks – who have detailed insights and knowledge about the communities' awareness, attitudes and behaviours, and who can collectively explore behavioural barriers and identify and prioritise behavioural intervention points for testing. This approach means that a tight, informed brief can be provided to the creative agencies.

Councils found having central coordination by the EPA to be effective and supportive. All three councils spoke positively about the idea of working with their regional waste group, which they consider to be well-placed to manage and report back on a regional media education campaign on the council's behalf. Councils could then manage the localised content and feed local stories back into regional communications.

Not having authority to post on the social media account delays an individual waste officer's ability to respond to posts. A key relationship for council staff to manage is, therefore, the one with the communications team members, who are frequently stretched. While this didn't hamper the three councils, it could be an issue for other councils.

There were challenges with the project monitoring and evaluation requirements, including the bin lift inspections, process and documentation. However, the reports and data are valuable resources in understanding the impact of the Scrap Together campaign and planning future projects.

Bin lift inspections provided the opportunity for councils to notice how many 'foreign' caddy bags were in use. It was noticed that some households were using white instead of green caddy liners: on enquiry, these were found to also meet the Australian Standards. However, one council reported that the use of white bags instead of the lime green ones is a problem for the facility pickers as white bags are usually plastic and therefore contaminants.

Next Steps

The EPA will be developing a grant program to enable councils with a FOGO service to run the campaign during 2021–22. An additional campaign video that will address contamination will be developed.

Conclusion

While this education intervention has only been run in three councils to date, the pre- and post-campaign data tells us that the narrative, calls to action and educational messaging used, along with its strong digital delivery method, strikes home in the NSW community.

Underpinning the campaign's educational messaging and success is a program design approach that draws on detailed stakeholder knowledge and delves deeply into social and technical data. It focuses attention and effort (for both program designers and the target market) on just a few specific behavioural intervention points and communicates them simply, positively, and with characters that resonate with a sprinkle of fun. This approach is likely key to the success of Scrap Together 2020.

For the EPA and councils this is a cost-effective method for recovering more food organics from the red-lid bin that can be diverted to make professional compost.

Appendix

Demographic insights from Micromex baseline social, behavioural and attitudinal insights report

1. Overall bin use: six household waste types

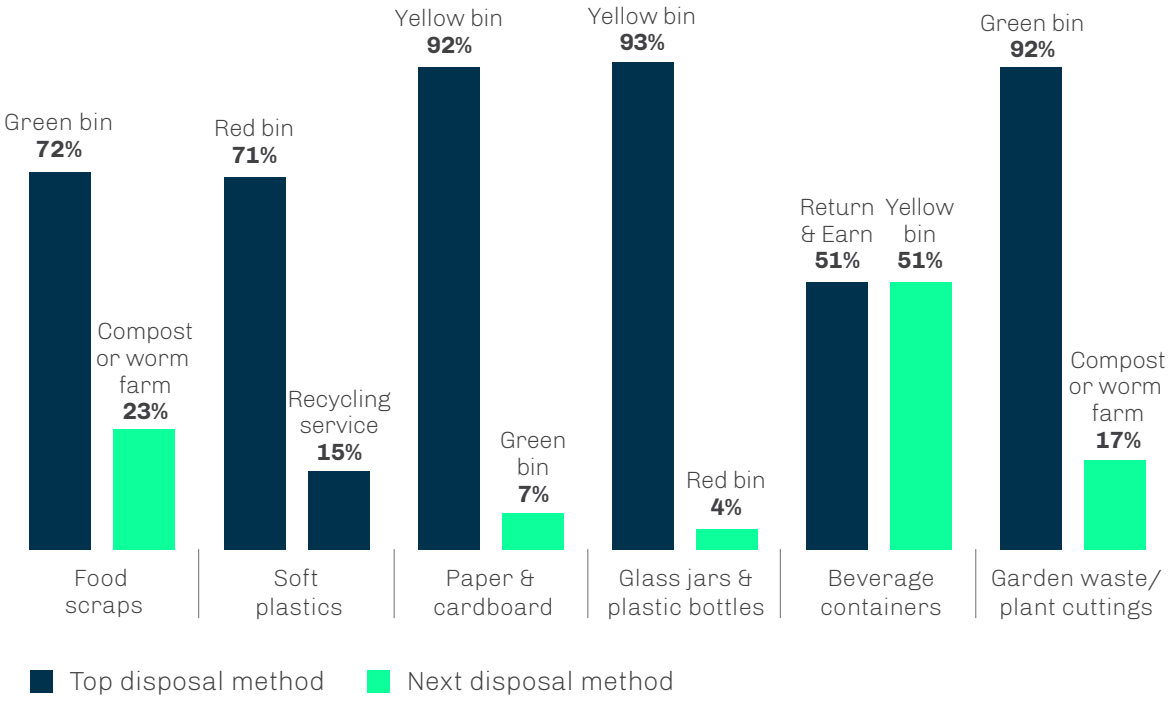

Figure 2 Top two disposal methods for six key waste types (Micromex pre-intervention survey, question 5- Mircromex report)

2. Demographic insights

The research findings suggested that:

Approximately 17% households put a high proportion of their kerbside food waste into the red bin rather than the green-lid FOGO bin. The main demographics are:

- younger residents (aged 18–44), who are significantly and substantially more likely than older residents to put food scraps in red bin
- those living in the area for five years or less
- residents less frequently preparing food at home
- poor recyclers of other unwanted materials/wastes
- renters
- those who speak a language other than English at home
- larger households/households with children (this was a marginal difference).

The 19% with significantly lower awareness of the **ability** to put all food scraps into the green bin tended to include:

- 18–44 age group
- those living in the area for five years or less
- medium-size household
- those preparing/eating dinner at home less frequently.

Those with low levels of awareness of the ability to place food scraps in the green-lid bin are, understandably, significantly more likely to put food in red bin (52%) than those who are 'very aware' of FOGO (where only 4% place food in the red bin).

3. Behaviour – scraps storage

Residents use a variety of ways to manage their food scraps:

- 37% of FOGO users that store food scraps in kitchen stated that, on average, they take scraps out daily.
- 67% of FOGO users store food scraps in a caddy/container/bin with a lid prior to taking scraps out to the green bin.
- Almost 1 in 4 (23%) FOGO users store scraps in fridge/freezer prior to taking out.
- Almost 1 in 5 (18%) say they take scraps straight to the bin i.e. no indoor storage.

4. Baseline attitudes affecting use of red/green bin

Residents had a range of reasons for not putting food scraps into the green bin:

- Residents had a range of reasons for not putting food scraps into the green bin:
- Food types that can be placed straight in FOGO bin but were most frequently placed in the red bin instead were bones, dairy, fish/seafood, and meat.
- Those aware of FOGO but who put any food items in the red bin answered an open-ended 'why?' question. Main reasons included
  - only small amounts are going in for reasons such as contaminated packaging, spoiled food, or not enough food waste generated to bother sorting
  - simply easier/more convenient/ forgetfulness
  - messiness and smell of food in the green bin. Which led to 'the yuk factor' (next point)
- 'Yuk factor': almost 25% of respondents (regardless of their FOGO behaviour) report finding it challenging to deal with the smell and mess of food waste in the green bin. When prompted, 77% of this cohort (compared to 45% of total sample) also stated that at least one of the 'yuk factor' issues was a major/big concern for them.

5. Awareness – knowledge and potential to change

Awareness of FOGO outcomes was significantly lower in 18–44 age group, females, and residents that had lived in the LGA for less than five years. (Note these groups are also in the high red bin use group.)

Medium-to-large households and households with children were less likely to be aware:

- that the contents of FOGO bin are turned into compost
- that landfill space is running out in NSW
- the impacts of food waste in landfill on climate change.

The research indicated that, having been advised of FOGO outcomes, change is possible:.

- Women indicated that they were significantly more likely to adjust their behaviour.
- People in the 18–44 age group indicated that they were significantly more likely to use the FOGO bin for food scraps now they knew the impacts of methane on climate change.
- Small households reported being significantly more likely to adjust their behaviour with the new knowledge than large households and households with children.

The Stage One Micromex report contains further detailed analysis and insights into topics including bin behaviours, sorting practices for food scraps, glass jars and bottles, paper and cardboard, beverage containers, garden waste and soft plastics, along with insights into practices about takeaway/home delivered food and its containers.

Table 10 Breakdown of council communication activities

	EPA financial Investment	Council additional financial investment (appx)	Council in kind hours (indication)	How the communication collateral was intended/used	Additional methods employed by the council to support the core campaign messages
Council 1 (CVC)	$10,000	nil	Appx 3 hours/ week for 1 month, 2 hours week for 2 months	Website landing page, customer service tv, radio (20 ads/week for 3 months/$1200) social media video & posts ($1200), ads in local monthly paper ($1200)	2 superside bus adverts for 3 months ($5,500) Stalls at farmers markets
Council 2 (Forbes)	$10,000 plus an additional $1,800 for farmers market	nil	Appx 0.5 day/week for 3 months. Comms team: 2–3 hours/ week appx Also produced 2 additional videos internally.	1–2 social posts/week (videos/stills/tips/ promoting desired behaviours, and solutions) plus, inviting residents' stories (incentives offered to contribute), 3 local media stories, 2 case studies, rates notice.	Stalls at farmers markets and community garden to distribute compost from the composting contractor. School competition was intended. Use of collection crews in media with a 'thumbs up for FOGO' 2 additional videos produced internally: Video of the local waste facility showing the food waste that could have gone into compost, Profiling agricultural use of FOGO compost.
Council 3 (Kempsey)	$10,000	$1,500 towards truck decal	Appx 0.5 day/week for 3 months Comms 1 hour/week	Council website banner, e-news, ads with rates notice (electronic), digital outdoor screens, radio, (40/month at estimated $3000) and TV advertising (sponsor weather segment and ad one night/week for 3 mths at estimated $4000), monthly media stories, use of social media for at least 25 stories, tips, showing the videos, including targeted boosts truck decal, towards end ($3000), 500 DL flyers ($153) for displays and markets.	Added truck decal towards the end of education campaign. Displays in library & at customer service desk connecting residents' bins to professional quality compost to avocados grown locally using that compost. Planned stalls at farmers markets. Prepared case study on avocado farmer who uses the locally produced compost.

6. Research studies underpinning the program design

Micromex (May 2020) *NSW FOGO Deep Dive Education Project Community Survey Stage One*

Micromex (Feb 2021) *NSW FOGO Deep Dive Education Project Community Survey Stage Two*

APC (April 2021) *'Deep Dive' Report: Comparison of Pre- and Post-Campaign Audits*

Rawtec (2020) *Analysis of NSW Kerbside Green Lid Bin: Audit Data Report*

For more information please visit
www.epa.nsw.gov.au/scraptogether

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ISBN 978 1 922447 60 9
EPA 2021P3123
June 2021