THE PACKAGING FORUM

Consultation: The use-case for compostable packaging in New Zealand

Author: Kim Renshaw, The Packaging Forum

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Introduction

Compostable packaging has significant value in the packaging system in specific applications where it can bring nutrients to composters for composting, thus diverting organic waste from landfill. Globally, diverting wasted food from landfill is a priority. In New Zealand (NZ), our Climate Change Commission recently declared organic recycling a top priority for reducing carbon emissions in the waste industry, alongside capturing more methane from landfills.

"Compostable packaging" incorporates a wide range of material types used in a variety of applications. However, some applications are not globally considered as best practice for the generally accepted "use case" for compostable packaging.

In this consultation document we aim to discuss:

- The system for compostable packaging in NZ
- Some existing international use cases for compostable packaging
- The NZ position previously published by WasteMinz Organic Materials Sector Group in 2016
- The range of existing compostable packaging materials and applications in the NZ marketplace, and,
- A proposed use-case for all stakeholders to work from as a step towards a working system for compostable packaging in NZ.

The system for compostable packaging in New Zealand

The system for compostable packaging in New Zealand is flawed:

- There is a distinct lack of collections infrastructure in both commercial and home settings.
- Processing capability is limited due to:
    - Organic certified composters being unable to include compostable packaging as an approved input.
    - A low number of food-waste consented compost facilities
    - Lack of decontamination infrastructure required to sort packaging.
- It is unknown whether there is capacity to process current and future volumes in the market.
- There is no agreed New Zealand labelling or certification for compostable packaging (however, several international certifications are recommended as being attained for those wanting to make compostability claims)

Due to the risk of contaminating compostable packaging collections with traditional polymers (and the associated risk of microplastics in soil), compostable packaging must be sorted or graded. While recyclables are processed through a Material Recovery Facility (MRF), globally there are very few examples of compostable packaging being processed the same way, with the responsibility falling to composters to undertake decontamination. Few composters in New Zealand run operations currently suited to the kind of decontamination required to prevent traditional polymers entering compost systems when accepting compostable packaging.

The Packaging Forum is working with other key stakeholders (including composters) on resolving the issues surrounding compostable packaging. As a member-based organisation made up of packaging manufacturers, distributors, brands as well as industry bodies, and processors, we have designed a collaborative work programme to progress solutions for compostable packaging in New Zealand. Our work programme is mission critical for compostable packaging because:

1. There are a large number of organisations (including our members) who make or sell compostable packaging who want and need solutions for the barriers identified, and,

2. Under the New Zealand Government's Priority Product Declaration of all Plastic Packaging, compostable packaging is included as plastic resin code 7 (other) and needs a robust full lifecycle to remain in trade, and,
3. A significant amount of industry body level work still needs to take place to solve the issues surrounding compostable packaging.

This use-case consultation aims to agree the applications and materials for inclusion into the system design. Many obstacles can be resolved through government policy as well as investment into infrastructure, but this cross-industry consultation is a critical piece of work to inform the future system parameters.

Existing international use-cases

Internationally, use-case documentation for compostable packaging is largely themed around facilitating food waste diversion.

#1 NORTH AMERICA

The Sustainable Packaging Coalition (SPC) released 'Understanding the Role of Compostable Packaging in North America' (SPC, 2021) as a guide for stakeholders. There is an evaluation (traffic light system) of which applications are best-fit (green), might-fit (orange) or not-fit (red) for compostable packaging (including all material types). The SPC guide states that all compostable packaging needs to be free of chemicals of concern.

Their guide helps readers rank applications and their fit for compostable packaging. Packaging with food scraps and wet food residue is green, such as serviceware and salad bags. Packaging for personal care items, clothing, cosmetics, alcohol and cleaning products are red due to the risk of residues in compost (i.e. alcohol, human waste, ink in biodegradable pens etc). Packaging that has no food residue and offers no resource value to compost is also red. Orange applications "might be a fit" but require more information and or more regulation or guidance from the government. These might include food contact packaging for example from pet food, cannabis, dressings and sauces and tea and coffee. Compostable packaging may not be a good fit for these applications because of the reasons listed for the red products, but other reasons may include that the packaging may have a sticky/oily residue that is hard to compost, or, because a recyclable packaging product is available (i.e. PET water bottles) with a strong recycling market.

The National Zero Waste Council (NZWC) in Canada has a Materials Acceptance Guide for a range of compostable packaging materials including plastic and fibre (NZWC, 2015). This is aimed to assist at the design stage with packaging material decisions. The guide states compostable packaging is useful for packaging in contact with food, since food-soiled items are common forms of contamination in the recycling system. The best-practice guide states the purpose of compostable packaging is to increase organics diversion from landfill and says designers should not use this packaging type if it will not contribute to food waste diversion from landfill (and instead should be designed for the recycling system). It also explains that recycling may be a better choice in some food contact applications such as single use drinks vessels, where collecting for recycling makes "more sense than finding the necessary complement of organic waste to compost them."

#2 EUROPE

Holland Bioplastics (Holland Plastics 2017 and Oever et al 2017) produced a concept for how it could be agreed with Dutch composters which applications would use compostable packaging to improve capture rates for organic waste at kerbside into composting. They proposed two phases:

Phase one (reflects common traditional polymer contaminants in collected organic waste)

- Compostable bags for food waste caddies
- Compostable fruit labels, coffee pods, coffee capsules and tea bags
- Compostable film (<100 micron) applications: e.g. produce bags for loose fruit & vegetables, flower wraps, films for fruit & vegetable packaging e.g. cucumbers

Phase 2 (additional opportunities)

- >100 micron fresh food packaging for fresh and chilled food

Not accepted (compostables which do not divert food waste from landfill):

- Compostable pens
- Courier bags
- Shampoo bottles

'The fate of (compostable) plastic products in a full scale industrial organic waste treatment facility' (van der Zee, Molenveld, 2020) was released by Wageningen University and Research commissioned by the Dutch government to prove certified compostable products would indeed break down in the supposed time determined by the certification standard. The research focussed on products that had a benefit for collecting organic waste (e.g. tea bags, plant pots, collection bags). The research found that bright coloured coffee capsules would be identifiable (and a problem) as fragments in the resulting compost but would be indistinguishable if dark coloured. The research also found reasonably high levels of traditional-polymer flexible (soft plastic) packaging and flowerpots as contamination, which suggested an association with the packaging and its organic waste.

The European Commission released a decision document in 2020 (EC, 2020) covering compostable and biodegradable plastic. Research concluded 'material choices for products and packaging should prioritise recyclability over compostability', unless they added benefits such as reducing contamination of compost or by increasing the collection of organic waste, and facilitating circularity in the bioeconomy (EC, 2020). The study also concluded the most potentially beneficial uses of compostable plastic were biowaste bags, teabags and fruit labels and the least beneficial applications included single use bottles or clothing packaging bags (figure 1 below).

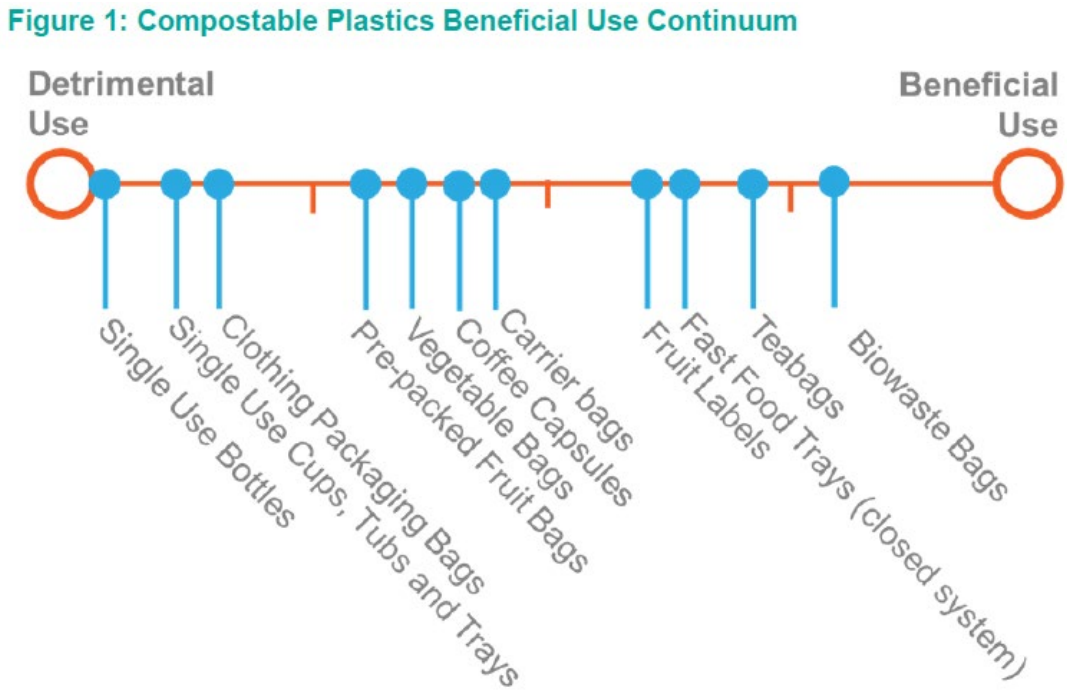

Figure 1: The least and most potentially beneficial applications for compostable plastic packaging Source: EC, 2020.

#3 AUSTRALIA (APCO) & UK (WRAP)

The Australian Packaging Covenant Organisation (APCO) released 'Considerations for Compostable Plastic Packaging' (APCO, 2020) closely based on WRAP UK's 'Considerations for Compostable Plastic Packaging' (WRAP, 2020). Both of these guides are for compostable plastic packaging only and not for those made of natural fibres or board.

Both guides consider that the acceptable applications for compostable plastic packaging are:

- Food caddy liners
- Fruit and vegetable stickers
- Closed loop situations (i.e. serviceware at a festival or event)

The WRAP (2020) guide includes 3 further applications:

- Tea bags
- Coffee pods
- Ready meal trays

These guides include decision trees for packaging users and manufacturers and guidance on communication.

IN SUMMARY

- Compostable packaging should be prioritised for:
    - applications where there will be (desirable) food residue (i.e. not too oily or greasy), offering the resource contained to compost such as food caddy liners, and
    - closed-loop settings where the packaging acts as a vehicle for capturing food waste, and
    - applications using traditional polymer/s which are common contaminants of the organic waste stream such as fruit labels.

- Compostable plastic packaging itself offers little nutrient value to compost.
- Applications where a resource (nutrient) is not necessarily captured are considered "grey areas" and more information is required to make a clear decision on whether compostable packaging is the best fit for the application.
- Packaging design should utilise the waste hierarchy from conception stage through to developed product.
- There is little guidance for compostable products and compostable fibre packaging (certified or uncertified).

Existing New Zealand use-case

In New Zealand, our system faces many challenges and we do not have one clear, agreed use-case or best practice guideline to refer to cross-industry. The aim of this consultation is to solve this problem. There are some organisations with published guidance on use-case, some discussed in this section.

In 2018 The Parliamentary Commissioner for the Environment released information about compostable packaging to clarify some of the claims being made around compostable and biodegradable packaging. They produced some guidance around what happens to these types of packaging products in New Zealand in the current system.

Figure 2. Options for composting or recycling common plastics in New Zealand, Parliamentary Commissioner for the Environment, 2018

WasteMINZ (Waste Management Institute of New Zealand) represents organic waste processors who are members of their Organic Materials Sector Group. WasteMINZ released a position statement from New Zealand composters on compostable packaging (2019) stating the following:

- Compostable packaging adds little value to compost and composters do not need it to make quality compost however,

- Food waste is a desired input, so compostable packaging that assists to bring food waste and nutrients to composters should be made compostable.
- Common contaminants in commercial and home compost systems such as small and hard to remove items should be made compostable (banana tape, tea bags, fruit stickers etc.)
- Agricultural items which are made from traditional polymers and fragment (such as mulch-film and vine clips) should also be made compostable.
- Products and packaging which pose a risk to compost such as nappies, cleaning containers and pens should *not* be made compostable.
- A closed-loop environment where 100% of packaging in the system is compostable (and is sorted) may be suitable for composting.
- Compostable packaging should not be bright colours, due to the risk of devaluing final compost with visible contamination fragments.

This position statement is the WasteMINZ use-case for compostable packaging. WasteMINZ have also prepared guidance documents for the advertising of compostable packaging in New Zealand including:

- Best Practice Guidelines for the Advertising of Compostable Products and Packaging and
- Guide to Advertising the Plastics used in Compostable Products and Packaging prepared in collaboration with Plastics NZ to assist with common confusion around compostable polymers.

WasteMINZ also have a list of composters which accept compostable packaging.

The Commerce Commission released Environmental Claims Guidelines for traders in June 2020. The guide specifies claims of compostability should be backed up by compliance to an international standard and should be clear how consumers are to compost the packaging. It also suggests that claiming compostability should consider limitations to composting such as accessibility.

New Zealand Food and Grocery Council (FGC) has a compostable packaging and products subcommittee who have concluded a position for their members of “not for now.” They define the current system as:

1. Closed loop applications (events etc.) are able to be taken to a commercial composting facility.
2. Applications where the item is consumed at home are either:
    1. Sent to landfill if commercially compostable (due to lack of kerbside collections), and,
    2. Sent to landfill if home compostable but the household does not compost, or
    3. Composted at home (if the household composts) but may take up to 12 months to biodegrade/disintegrate.

Presently in New Zealand there is no official NZ standard for compostable plastics or other packaging, however it is agreed by composters that the generally accepted standard for compostable film is the Australian Standard AS 4736:2006 ‘Biodegradable Plastics suitable for composting and other microbial treatment.’ Compostable packaging sold in New Zealand is also subject to Food Safety Australia and New Zealand (FSANZ) regulations which determine food safety and chemical additive regulations.

A condition of any item in the future circular system would be certification/s within to-be-agreed parameters.

Range of existing materials in the NZ marketplace

There is a wide range of compostable packaging (packaging designed to be composted) available and in use in New Zealand. Different material types are constantly being blended to improve performance in certain applications as compostable packaging is a highly innovative and changing marketplace. Material type affects composters as some combinations may not disintegrate as quickly as others in the timeframes composters are running. In North America, the Compost Manufacturers Alliance certifies product/material types to different compost methodologies to assure composters that the packaging they agreed to take will break down in their specific facility.

Compostable packaging materials have varied feedstocks. Some are from renewable resources and some are from fossil fuels. The below infographic is widely known globally, showing that not all biobased plastics are biodegradable or compostable and that not all biodegradable or compostable plastics are from renewable feedstocks.

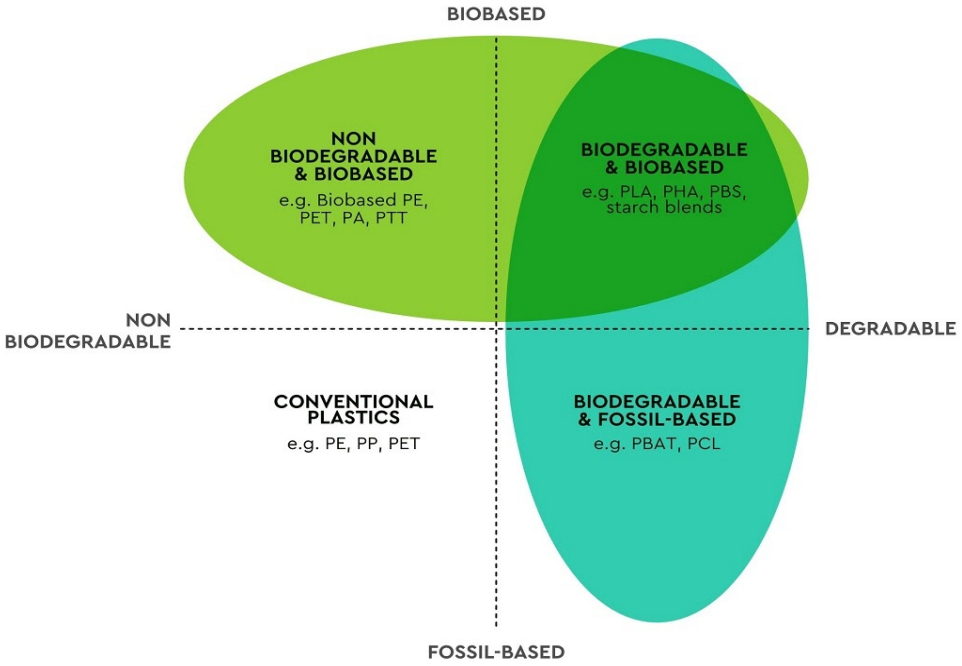

Figure 3. What does compostable and biodegradable really mean, Auckland Council 2019

Below is a list of commonly found compostable packaging material types found in the New Zealand market currently. These materials have been grouped into categories: Rigid/semi-rigid or flexible for each fibre, composite and plastics. This list is not exhaustive and is merely a guide to show how many different material-types and combinations are potentially in one future working system.

Table 1: Examples of material types and combinations currently in the marketplace.

Category	Material type	Compostability	Comments
Rigid/ semi-rigid fibre	Bagasse bowls, plates, clams, cups, lid	Commercially and home compostable, some certified	Most common material in market for food service, low price point
	Wooden cutlery	Commercially and home compostable but generally uncertified	
	Potato starch plates/trays/bowls	Commercially and home compostable but generally uncertified	Made in NZ
	Kraft board plates, trays, clams, boxes	Commercially and home compostable but generally uncertified	
	Moulded fibre trays & punnets	Commercially and home compostable & generally certified	Made in China Malaysia and North America
	Bamboo plates, trays, bowls	Commercially and home compostable & generally certified	
Flexible fibre	Paper “napkins”	Assumed home/commercially compostable, generally uncertified	
	Fibre netting fruit and vegetable bags	Home and commercial compostable and generally certified TUV	Made in Europe
	Baking paper	Assumed home compostable, generally uncertified	Some product in market, marketed as compostable
	Grease proof paper with bio-wax	Assumed home/commercially compostable, some certified product in market	
Flexible composite	Pouch: kraft paper, compostable polymer and compostable metallised paper	Layers individually certified commercially compostable but not certified in final form	

Rigid/ semi-rigid composite	Fibre cup, tray, bowl with water-based dispersion barrier	Commercially compostable most are certified	"New generation material" often marketed as "plastic-free"
	Kraft board lined with PLA	Commercially compostable	
	Kraft board with aqueous coating	Commercially compostable	
	Virgin fibre cup with PLA barrier lining	Commercially compostable	Huge numbers in market, huge variety of colours, high ink
Rigid polymer	C-PLA lid	Commercially compostable	Identification issues, colours: black, opaque white
	PLA containers	Commercially compostable	(Smoothie cups/lids, punnets), clear rigid, identification critical, PET may be a better alternative in some applications
Flexible polymer	Compostable film (cling wrap)	Certified home compostable	Relatively good volume: nutrient ratio predicted
	PBAT, PBS, Starch, PLA (different blends on market) bin liners	Home and commercially compostable, certification common	Food waste caddy liners, also sold as rubbish bin liners and courier bags
	"Natureflex" cellophane	Commercially and home compostable	Replacement for cellophane
	Multi-layer flexible polymer	Some certified home and commercially compostable and some not in market in NZ	Used in FMCG – chicken, crisps etc. Big variety of blends in market to increase shelf life

Proposed New Zealand use-case

With the system for compostable packaging in New Zealand in design-phase, there is a unique opportunity to draw a line around the types of materials and applications in the future (working) system. We can do this as a group of stakeholders affected throughout the entire system.

This consultation aims to draw consensus on where the system parameters for compostable packaging should be, to have the greatest benefit for the environment, and to ensure a positive flow on effect of improving the recycling system for packaging. Ultimately, we wish to create a robust system, working to its strengths and worth investing in.

The system for compostable packaging is, by association, likely to contain and include compostable products (such as baking paper, cling film). So, whilst it may be unlikely any regulated compostable packaging system would also regulate compostable products, we include them here for consideration in how they might affect the system design for compostable packaging.

Globally, it is widely agreed that compostable packaging should be used to increase food waste diversion away from landfill into composting, or to reduce common contaminants in compost. It is also agreed that where packaging does not meet these criteria, the waste hierarchy should be utilised to either: avoid the packaging, incorporate reusable packaging, or pursue recyclable packaging. Additionally, reusing resources, should be prioritised over single use.

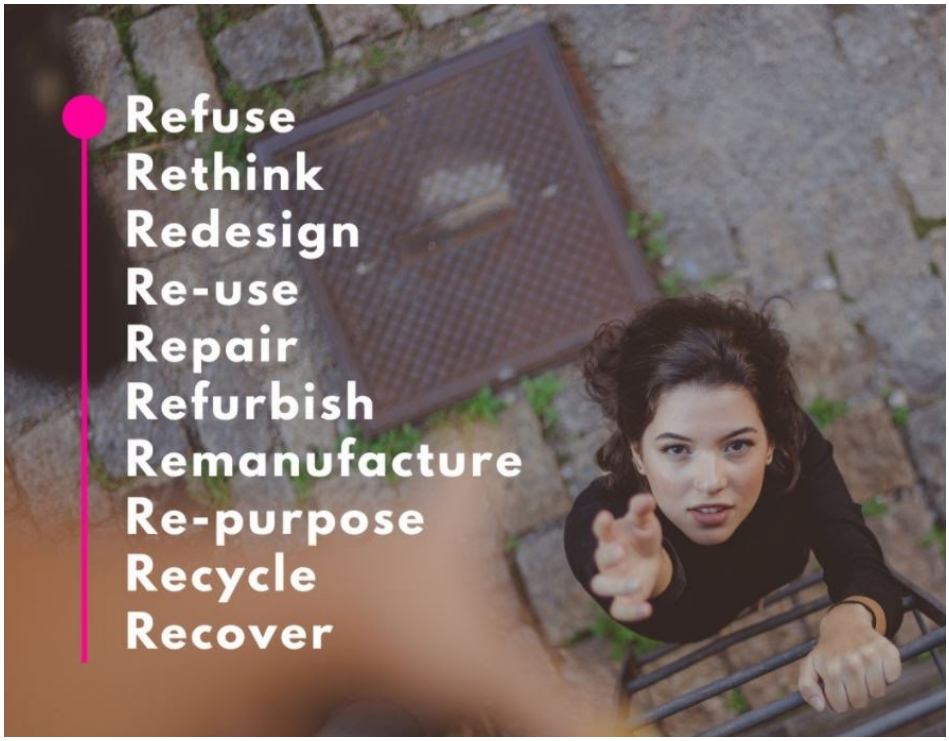

Figure 4. Circular Stories, 07 May 2021

It is possible that in the design of an agreed use-case for a system, packaging that did not meet the top criteria of diverting food waste as a primary objective, may be able to be designed for that purpose as a secondary objective. For example, this could mean using design principles to ensure a second life as a caddy liner.

In the current landscape, taking the New Zealand Government's Priority Product Declaration into consideration, it is critical that non-recyclable packaging is **not** all made compostable. The compostable packaging system must be restricted to specific applications and material types

which support the key principles below, and do not pose any risk of harm to compost and the resulting soil.

KEY PRINCIPLES

The following are proposed to direct the definition of the use-case:

1. Compostable packaging (or products) should have the purpose (primarily or secondarily) to collect and deliver nutrients of value to composters, or
2. Packaging or products which are common contaminants of the compost system (fruit stickers/tape, plant pots) should all be made compostable, and/or
3. Packaging or products which commonly contaminate recycling streams with food waste or nutrient residue should all be made compostable, and
4. Compostable packaging or products (or the residues they contain) must not cause harm to compost, and must be certified to an agreed standard/s and agree to abide by relevant regulation, *and*
5. Compostable packaging or products should bring better environmental benefits over alternative materials.

The main difference between Home Compostable and Commercially Compostable certifications is the length of time and temperature required to break down certified materials. Should *the application (not the material)* fit commercial composting we can assume that it would also fit home composting. However, the same cannot be said for material types of which some (such as rigid PLA) are not suitable or certified for home composting (which is generally reflected in the types of certifications held). Capacity of home composts are much reduced as is the capability of home composters to compost effectively. Carbon: nitrogen ratios and temperatures must be optimum in home composts to reduce methane emissions from (poor) composting. Although we pose here the “application” fits both commercial and home composting, home composters may require guidance on how many of the items can be placed in a home compost over a period. This is because disintegration lab testing for compostable packaging certifications is undertaken on one uniform (size) piece, cut down from the final form – so may not accurately reflect multiple inputs of certified packaging into composting systems over time.

In addition to this, compostable packaging has a duty of care to the soil it breaks down in, to be a safe addition into the food system that composting is part of. Compostable packaging standards also have tolerances for non-biodegradable inputs to make up a certain percentage of the material, sometimes up to 1% of a given input. For this reason, this consultation also proposes that items included in the use-case “system” for compostable packaging *declare all ingredients and additives.* Assurance would be given, and precautions taken to protect intellectual property. Please note this is not a suggestion to label this information to the consumer.

CONSULTATION QUESTION 1

Do you agree with the use-case Key Principles?

CONSULTATION QUESTION 2

Do you support ingredients labelling (to a certification managing body, not to the consumer) for compostable packaging processed in New Zealand compost facilities or home composts?

COMMERCIAL AND HOME *COMPOSTABLE PACKAGING* APPLICATIONS

Table 2a. Proposed NZ use-case for compostable packaging

Best fit application	Material types All must be certified. No "assumed compostable". No mixed material-types with non-compostables	Conditions
Plates/trays	• Bagasse • Bamboo • Kraft board • Potato starch • Palm leaves	
Cutlery	• Wood	C-PLA may be restricted by government regulations
Pre-packed meat FMCG (flexible polymers/blends)	• Flexible polymer single or multi-layer	
Coffee cups (reuse should be prioritised)	• Composite: paperboard and PLA lining	New-generation "Plastic -free" materials – more information required
Cling wrap	• Flexible polymer	
Ready meal trays	• Bagasse • Bamboo • Kraft board • Potato starch *with flexible polymer window	
	•	
Food caddy liners	• Flexible polymer	Purpose is purely to bring food to composting
Napkins	• Fibre without additives	
Plant pots and bases	• Rigid polymer • Fibre	
Coffee pods	• Rigid polymer	Must not require separation from recyclable materials
Produce netting bags	• Fibre	From wood fibre woven net bags (certified)-metal clip must be separated

Conditional application	Material types All must be certified. No "assumed compostable". No mixed material-types with non-compostables	Conditions

Mailer bags	• Flexible polymer • Fibre, paper	1. Does it have any value to compost? 2. Possible second life as caddy liner 3. Risk of mailer label as contaminant/harm must be mitigated
Flower wrap	• Flexible polymer • Paper	1. Does it have any value to compost? 2. Can we mitigate the risk of chemicals used in the application?
Produce bags		1. Does it have any value to compost? 2. Possible second life as a caddy liner
Cucumber wrap	• Flexible polymer single layer	Not on market, but may fit
Food zip-lock bags	• Flexible polymer single or multi-layer	1. Does it have any value to compost? 2. Possible second life as a caddy liner 3. All elements must be compostable
Packing materials	• Expanded PLA • Pop starch • Wood wool	No assumed compostable materials, e.g. recycled fibre, shredded office paper, due to inks associated and lack of certification
Small/sample size	• Flexible polymer • Rigid polymer • Composite materials • Fibre	Items commonly fall out of recycling system in MRF
Lolly wrappers	• Flexible polymer • Fibre	1. Does it have any value to compost? 2. Unable/unlikely to be recycled
Food preparation gloves	• Flexible polymer	1. Does it have any value to compost? 2. Would need to be easy to identify, high risk of contamination with non-compostables and through medical/cleaning use. 3. Common contaminant of wasted food collections in commercial settings
Packaging around home electronics	• Expanded starch • Expanded PLA • Moulded fibre	1. Does it have any value to compost? 2. Unable/unlikely to be recycled
Solid PLA drinking cups		PET or reuse better application

Yoghurt pots or containers	• Rigid polymer • Flexible polymer	Not on market, but could fit definition of common contaminant of #5 recycling stream

"Would not fit" applications	Material Type	Reasoning
Non-food packaging not connected to nutrients, not connected to harmful chemicals e.g. toilet paper wrap	• Fibre • Flexible polymer	Better to make of a recyclable material like paper or soft plastics
Shampoo/Makeup bottles or boxes		Risk of associated chemicals harming compost systems
Pallet wrap	• Flexible polymer	Better to make of a recyclable or reusable material
Meat trays	• Rigid PLA • Compostable moisture soaking pads	Better to make of a recyclable material like PET if able to be cleaned and processed in recycling system
Rubbish bags	• Flexible polymer • Paper/fibre	Harm from bags and contents breaking down in landfill
Water bottles	• Rigid PLA	Better to make of a recyclable or reusable material, especially where PET recycling system is strong
Clam Shell	• Rigid PLA	Better to make of a recyclable material, especially where PET recycling system is strong
Cardboard packing boxes	• Kraft/fibre	Put into recycling system
Alcohol bottles	• Moulded fibre	Better to make of a recyclable material, especially where glass recycling system is strong
Paper bags	• Paper	Often have wet strength additives not suitable for composting. Put into recycling system

CONSULTATION QUESTION 3

Do you agree with the proposed categorisation of compostable PACKAGING applications (and their material types) as proposed for commercial and home composting in NZ? Please give as much information as you feel is relevant.

CONSULTATION QUESTION 4

Do you support items being included in the use-case if they are secondarily designed to bring food waste to compost? For example, a mailer bag specifically designed to have a second life as a caddy liner.

COMMERCIAL AND HOME COMPOSTING *PRODUCT* APPLICATIONS

N.B. The system for compostable packaging is, by association, likely to contain and include compostable products. So, whilst it is unlikely any regulated compostable packaging system would also regulate compostable products, we include them here for consideration as they might affect the system design for compostable packaging**.**

Table 2b. Proposed NZ use-case for compostable products

Best fit	Material types	Comments
Fruit stickers	Flexible polymer and adhesives	
Tea bags	Fibre	
Cotton buds	Wood and fibre	
Dish scrubbers	Wood and polymer	

Might be a fit	Material types	Comments
Dog Poo Bags	Flexible polymer	• Risk of worming medications harming worms and microbes in soil • Needs to be separately run home compost e.g. in ground bin with lid.
Baking paper	Paper	Dependent on additives used in heat applications

Not a fit	Material type	Comments
Towels	Unknown, on market in NZ	Re-use should be prioritised
Cleaning cloths	Sponge	Risk of associated chemicals
Nappies	Composite polymer	Human faecal matter poses risk to soil where being used to grow food
Wooden toothbrush	Wooden handle and nylon bristles	Composite product requiring consumer to separate materials
Pens	Rigid PLA	No connection to nutrients and risk of inks
USB sticks	Rigid PLA	No connection to nutrients and risk of associated materials, metals

CONSULTATION QUESTION 5.

Do you agree with the proposed categorisation of compostable PRODUCT applications (and their material types) as proposed for commercial and home composting in NZ?
Please give as much information as you feel is relevant.

CONSULTATION QUESTION 6.

Do you support a cross-industry agreed use-case for compostable packaging applications and materials for commercial and home composting?

Consultation closing date: 30 June
Short submissions may be submitted through an online survey.
For more detailed submissions, please email info@packagingforum.org.nz
Following the closing of the consultation, we will be analysing the results and publishing a summary document which will include recommendations.

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