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Capstone Projects

Title

The Circular Directory - Closing the Loop on Single-Use to Reuse, a One Stop Shop for Restaurants to Make a Sustainable Transition

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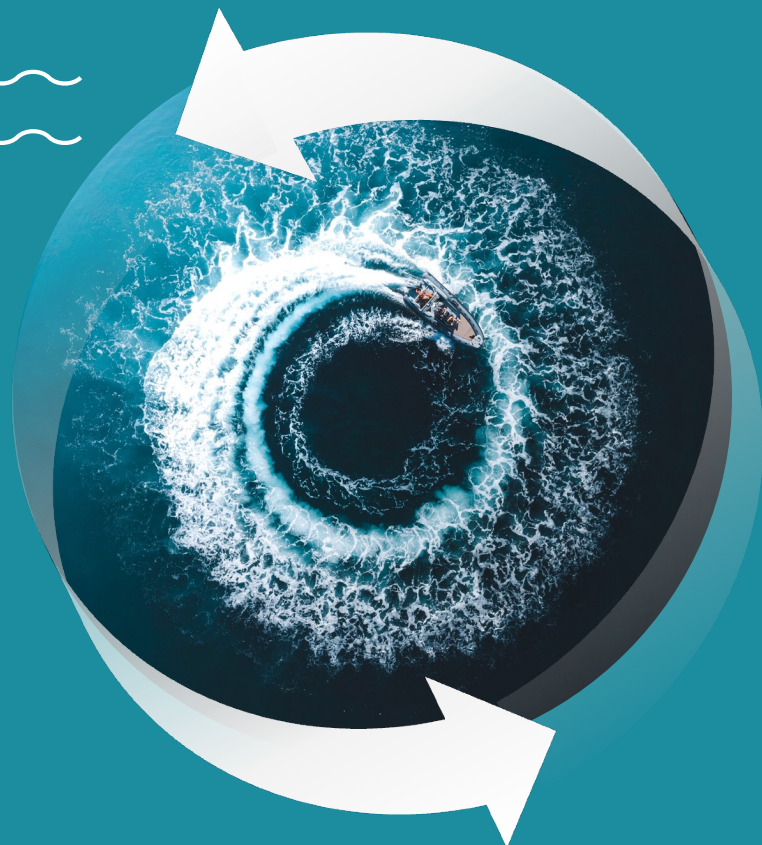
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THE CIRCULAR DIRECTORY

Closing the Loop on Single-Use to Reuse,
a One Stop Shop for Restaurants to
Make a Sustainable Transition



thecirculardirectory

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June 2023

UC San Diego



SCRIPPS INSTITUTION OF
OCEANOGRAPHY

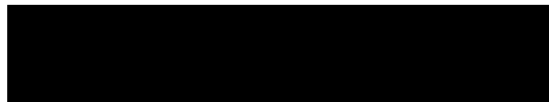
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Abstract

Plastic pollution has penetrated every part of our earth and oceans with long lasting consequences that we are only beginning to understand and address. The environmental and health impacts are widespread, affecting our lives in ways we can no longer ignore. Raw plastic production is also contributing to our reliance on fossil fuels, which is contributing to climate change. This crisis requires systemic change from the source. Without wide-scale extended producer responsibility, the unregulated production combined with our consumer driven societies has allowed the waste of plastic products to burden the end user. However, our throw away culture is beginning to shift. Consumer awareness is trending towards sustainability and zero waste solutions. This momentum has led to an emerging solution-focused idea, circular economies. By designing products for reuse to put back into the production loop we can save materials, energy, and waste from polluting our environment.

This issue has become apparent in the restaurant industry with varying levels of effort to move away from single-use plastics. I noticed a gap with restaurants trying to navigate towards more sustainable practices and finding the best packaging alternatives that could serve them. My capstone helps close the loop by connecting these businesses with the resources they need to streamline their path to sustainability. The purpose of this project was to make circular economy foodware services and sustainable packaging product replacements more easily known and accessible. It was also created as a resource to help restaurants comply with local and state level laws and ordinances around packaging bans. I did this by creating a one-stop-shop website with an online directory of sustainable vendors, a how-to guidebook, and case study stories. Collaborating with Surfirder's Ocean Friendly Restaurant program, this project is intended to support their restaurant network here in San Diego and nationwide. The goal was to make restaurant owners transition convenient, affordable, and more accessible in their move away from single-use plastics.

Website

www.thecirculardirectory.site

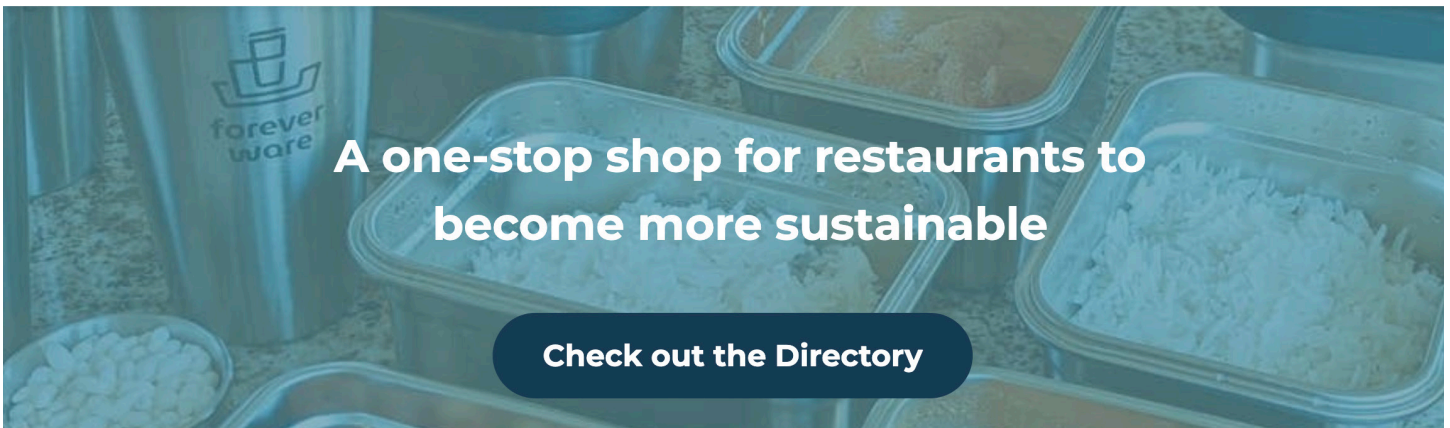
My capstone project was the creation of a website that host resources a restaurant owner would need in their transition to sustainable packaging and away from single-use plastics. This website has a vendor directory, and links to resources including a guidebook, and three case studies, which are available as downloads or can be viewed on the web. The directory host over 30 different sustainable vendors that offer common takeout and dine-in packaging options that are meant to serve as sustainable alternatives to single-use plastic. The directory includes vendors that offer plant based packaging, reusable goods, and reusable services. These vendors are easily found through the search bar and can be filtered based on specific needs through the various filter feature options. There is also detailed infomation on each vendor along with specific tags and links to their website.



GUIDEBOOK

THE DIRECTORY

CASE STUDIES



Featured Reusable Services

These are companies that provide restaurants the full suite of services - everything from the reusable container to the delivery, pick up and drop off, and logistics. All you have to do is what you do best, supply the food!

 Pit & Seed Local food. Sustainably delivered. Reusable Services	 Dispatch Goods Making it easier for your food to be delivered in reusable packaging. Reusable Services	 forever ware Forever Ware provides essential technology to make reuse easy and feasible. Reusable Services
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Sustainable Vendor Search

Use the search bar to filter vendors by product type. Use the filters to browse the different packaging options for your business.

Q Type here to search Category Type Filters

Filter by Waste Disposal Type

- Commercial Composting
- Home Composting
- Marine Degradable
- Recyclable

Filter by Vendor Location

- National
- Regional

 bambu Sustainable Home Goods & Eco-Friendly Dinnerware Reusable Goods Goods Compostable Packaging, Biodegradable Packaging	 Bliss Foods™ Bliss Foods™ is the world's 1st edible superfood tableware Zero Waste Goods Biodegradable Packaging	 Bresco Bresco is a full service equipment and supply dealer. Reusable Goods Goods
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Featured Reusable Goods

Here you'll see a variety of vendors that supply all sorts of reusable containers you can use for your dine-in or takeout services. These vendors make it easy to start trying reusable containers at your own pace and within your control.

 reVessel reVessel offers leakproof, reusable, modular, toxin-free and eco-friendly food and beverage containers. Reusable Goods	 steelys drinkware Wholesale Supplier of Custom Stainless Steel Cups, Bottles & Foodware Reusable Goods	 Coconut Bowls Coconut Bowls transforms the way we consume by crafting elegant, sustainable solutions that inspire healthier choices... Reusable Goods Goods
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 Coconut bowls Coconut Bowls transforms the way we consume by crafting elegant, sustainable solutions that inspire healthier choices... Reusable Goods Goods Reusable Packaging, Biodegradable Packaging	 COFFEE KREIS Reinventing coffee waste Reusable Goods Zero Waste Goods Biodegradable Packaging	 Dispatch Goods Making it easier for your food to be delivered in reusable packaging. Reusable Services Zero Waste Services
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 eco-pliant	 ECO	 eco-gecko products
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A GUIDE TO

**SUSTAINABLE
& REUSABLE
PACKAGING**



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INTRODUCTION

In the most comprehensive study to date, it was found that “plastic items from takeaway food and drink dominate the litter in the world’s oceans.”¹ This problem is not only threatening the health of oceans, but also food and human health, and contributes to climate change.

Today, most dining now uses disposable food-service-ware. Since COVID-19, delivery and takeout have accelerated and food-on-demand has become the norm. As a result, items like takeout containers, bags, boxes, condiment packets, plastic utensils, cold and hot cups and lids, napkins and more are really adding up.

“Nearly 1 trillion disposable food service products are used each year in the United States.”²

This doesn’t account for other sources of single-use disposables that are proliferating other sectors. The end of life for these items, including plastics that are built to last, don’t always end up in proper disposal even in places that have the facilities. **“An estimated 8 million metric tons (MMT) of plastic waste enters the world’s ocean each year—the equivalent of dumping a garbage truck of plastic waste into the ocean every minute.”³**

Unfortunately, the cost of these disposables is higher than we realize. These include the following: extraction of natural resources from our environment, chemicals used in the production of plastics, toxins that leach out and affect our health and communities, business impacts like on-site waste management, the cost of litter clean-ups and more. These costs showcase that there are opportunities to create improved systems to serve customers without all the waste.

The good news is a break-up with single-use plastics is on the rise. Everything from reusable takeout services to home composting, and sustainable packaging alternatives, highlight how suppliers are shifting to do better. We’re also beginning to see a move from a linear economy to a circular one where products are being designed for reuse to put back into the production loop to save materials, energy, and waste from polluting our environment.

A new wave of doing business is emerging and **restaurants have the power to help turn the tide. This guidebook will empower you to reduce waste by giving you the tools and knowledge you need to build brand loyalty, increase business opportunities, and lead the way to a more sustainable future.**

SUSTAINABLE FOOD PACKAGING

WHAT IS SUSTAINABLE FOOD PACKAGING?

Sustainable food packaging is the wave of the future. It's made from materials that are recyclable, compostable and renewable. It reduces strain on our planet's finite resources and keeps virgin materials out of circulation in favor of reusable or renewable ones.

Thinking about the lifecycle of food packaging, **disposal is often the most forgotten and problematic stage for our environment.** Food packaging frequently winds up in landfills. Commercial composting facilities are growing but the supply and demand aren't quite on the same page yet. Landfill disposal is problematic because the conditions aren't designed for compost packaging to degrade, instead it releases methane gas, or ends up leaching into our environment or oceans where it harms wildlife.

IS MAKING A SWITCH RIGHT FOR YOU AND YOUR BUSINESS?

We're currently using finite resources to create these products that will eventually not be available to us. Since we know how harmful the end-of-life for food packaging can be, it's our responsibility to understand these impacts so we can make more informed business choices for our planet and communities. Making a switch to sustainable packaging can reduce waste impacts significantly and our reliance on fossil fuels, which is a major component of single-use plastic packaging.

Many traditional takeout packaging products are made from chemicals (petroleum based) that can leach into our food, and over time harm our health. **Sustainable packaging on the other hand, is made from non toxic materials (like plants), which won't contaminate our food or harm our bodies.** The good news is choices in sustainable packaging have expanded and are continuing to grow. The options are available and navigating them will be just as important as making a switch.

{TIP: see the terminology section below to understand the best choices for your business.}

"Food and food packaging is responsible for nearly half of the waste in landfills in the US."⁴
- U.S. Environmental Protection Agency

ADVANTAGES OF USING SUSTAINABLE FOOD PACKAGING⁵

- 1 BRAND AWARENESS**
Shopping consciously is trending among customers and they're even paying more for businesses that offer sustainable products.
- 2 SAVE MONEY**
Using reusables will save you from constantly purchasing packaging and eventually save you money in the long run.
- 3 CUSTOMER SAFETY**
Switching to non-toxic materials can ensure the safety of your food to customers without worrying about harmful chemicals.
- 4 ENHANCE CUSTOMER EXPERIENCE**
Packaging updates will be noticed and appreciated by customers, especially if it's custom branded.

{TIP: see website directory tag #custombranding.}

Infographic credit: tips provided by noissue.co

WHAT IS GREENWASHING AND HOW DO I AVOID IT?

As sustainable products continue to evolve and diversify, the appeal to consumers also rises. This has created a host of businesses using marketing jargon that can confuse even the most savvy person. **That's why understanding sustainable terminology is important for business. Knowing the terms and certifications will give you the confidence to navigate the world of sustainable food packaging.**

"Greenwashing is a process in which a company presents false claims and information to mislead the public image and to be perceived as environmentally sound when in reality, there is nothing to back up that claim."⁶



WHAT SHOULD I LOOK OUT FOR WHEN ORDERING FROM MY SUPPLIER?

- 1 CERTIFICATIONS**
Look for SFI Certified and BPI-certified compostable items. ASTM (American Society for Testing and Materials) is the standard.
- 2 SNEAKY PLASTICS**
Plastic liners and even glue are often found on compostable items like coffee cups and others.
- 3 RELYING ON IMAGES**
Many suppliers may include badges or images with sayings like "eco-friendly." Be sure they can back up their claims by reading the fine print.

COMMON BUZZWORDS
"Eco, green, recyclable, sustainable, all-natural, environmentally friendly, biodegradable/bio, made from plants."
{TIP: make sure vendors can back up these claims by verifying certifications.}

Infographic credit: tips provided byplasticfreesa.org

TERMINOLOGY & CERTIFICATIONS

ZERO WASTE

This is a process that involves the entire life cycle of a product while minimizing environmental impacts and conserving natural resources.

{TIP: the city of San Diego has a [Zero Waste Plan](#)— goals to divert all solid waste from going into the landfill.}

RECYCLED CONTENT



Recycled Content	Pre-Consumer Recycled Content	Post-Consumer Recycled Content (PCR)
"Materials recovered from the waste stream during production or after consumer use. (Includes pre-consumer and post-consumer recycled materials used in a product.)" ⁸	"Pre-consumer (also referred to as post-industrial) content refers to materials that are sent through the recycling stream before they are commercialized or used by consumers." ⁷	"Post-consumer content is material that's recycled after its use. These materials are diverted from landfills to create other items." ⁹

REUSABLES

To-go food containers that are specifically designed for reuse as opposed to disposable food containers that are thrown away after being used once. **Material examples include: stainless steel and glass.**

A GUIDE TO REUSABLE TAKEOUT CONTAINERS

As bans and policies continue to push these efforts forward, exploring alternatives to common takeout containers like plastic and polystyrene (a.k.a styrofoam) will be important for restaurants. You have the opportunity to lead the way in transitioning with new packaging alternatives.

BRING YOUR OWN PROGRAM

Encourage customers to bring their own reusable containers!

REUSABLE GOODS

Purchase reusable goods from vendors and start your own reusable program.

REUSABLE SERVICES

Provide you with all your reuse needs for takeout services.

{TIP: use the [website directory filter features](#) to find the best fit.}



Infographic credit: Ellen MacArthur Foundation

DEGRADABLE VS. COMPOSTABLE VS. BIODEGRADABLE¹²

DEGRADABLE	BIODEGRADABLE	COMPOSTABLE
Degradable simply means "to break down."	Materials that break down into their basic parts (water, carbon dioxide, and biomass).	Material that can be broken down by naturally occurring microorganisms like bacteria and fungi.
All products eventually break down but the time-frame varies significantly. Plastics, for example, can take thousands of years, turning into microplastics that are harmful to humans and the environment.	This is a naturally occurring process. While every material eventually biodegrades the time-frame can take centuries. "It can take anywhere from a few days (for vegetable scraps) to 500 or more years (for a plastic bag)." ¹⁰	"The composting process generally takes between a few months and one to three years. Timing is impacted by variables like oxygen, water, light, and the type of composting environment." ¹¹
Products labeled as "degradable", don't guarantee it will 100% break down. It usually takes much longer for products to degrade than it does for biodegradable or compostable items to break down.	Unlike compostable, the term biodegradable is not regulated. There is no time limit for biodegradation, and no testing is done to ensure that the product is free from dangerous toxins.	Products labeled as compostable must be tested to meet U.S. industrial composting standards ASTM D6400 and ASTM D6868. These standards require that compostable products biodegrade within 90-180 days and leave no harmful toxins.

{TIP: everything that is compostable is also biodegradable. However, biodegradable does not always mean compostable. [Learn more here.](#)}

WHAT'S THE DIFFERENCE?

COMMERCIAL COMPOSTING

Can only break down in specific conditions of heat and oxygen.

{TIP: consider this when choosing products - commercial composting facilities are not as common as landfills and recycling plants.}

[Find a compost facility near you](#)



HOME COMPOSTING

Designed to break down in a home compost environment. Currently ASTM does not provide a test standard for home compost. Labeling to look out for: Australian standard called AS 5810. ("compost in a home compost environment in under a year").¹³



TIP

When purchasing products that claim to be compostable, **READ THE LABEL.** With Biodegradable items, labeling of compostable materials is regulated by the **FTC** and third-party certifiers.

Make sure to find out whether the product can be composted in a backyard bin or will require commercial composting.

[City of San Diego guidelines.](#)

TERMINOLOGY & CERTIFICATIONS - PLANT BASED MATERIALS

BIOPLASTICS

"Bioplastics are materials made from renewable sources, such as sugar from plants like corn and sugarcane, oils, recycled food waste, and more, and then converted into polylactic acids (PLAs) or polyhydroxyalkanoates (PHAs) to make products."¹⁴

PLA (polylactic acid)	tPLA	cPLA
"Made from sugars in corn starch, cassava or sugarcane. It is biodegradable, carbon-neutral and edible." ¹⁷	"Created by combining 70% PLA and 30% talc. Talc is a natural mineral that helps PLA mold into harder materials." ¹⁵	"Created by applying high pressure and heat to PLA and other biodegradable and bio-based additives. This makes harder products that are less susceptible to heat degradation." ¹⁶

PROS	CONS
<ol style="list-style-type: none"> 1 Reduces climate emissions because it uses carbon from the atmosphere rather than from fossil fuels, keeping climate impacts low. 2 Bioplastics are plant-based, unlike petroleum based plastics. 3 Manufacturing may have a lower carbon footprint than traditional plastics (<i>but still have variables and uncertainties</i>). 	<ol style="list-style-type: none"> 1 Most need high temperature, industrial composting facilities to break down and not every place has the infrastructure. As a result, they often end up in landfills without oxygen, which may release methane, a greenhouse gas more potent than carbon dioxide. 2 It can take a long time to break down in a at home compost or in a landfill. It also can't be mixed with recyclable plastics and must be put in separate bin. 3 It doesn't address the issue of marine plastics because it won't biodegrade quickly in marine conditions.


Infographic credit: goodstartpackaing.com

FOODWARE EXAMPLES	Product	Paper & Paperboard	Fiber-based	Plastic	BioPlastic	Reusables
	Source Materials	Trees, recycled paper	Molded pulp (trees bagasse, other plant waste)	PETE, PP, PS, EPS	PLA, PHA	Ceramic, stainless steel, shatterproof glass, plastic
Uses	Cups, plates, liners, boxes	To-go clamshell containers, plates, bowls, trays	All types of disposable foodware	Cups, lids, utensils, straws, to-go clamshell containers	Dining on-site, take-out cups & food containers	
Challenges	Can contaminate compost – not accepted by all compost facilities.	Can contaminate compost – not accepted by many compost facilities.	Most too contaminated or not designed to be recycled, when littered, doesn't biodegrade.	Not accepted by most commercial composters. Degrades in lab setting but not in real world.	Upfront purchasing costs. Dishwashing (generally a perceived rather than true challenge).	


Learn more here

Infographic credit: UpStream Solutions


COMMON PLANT BASED MATERIALS




Palm Leaf




Agave




Bagasse/Sugarcane



Cellulose



Bamboo



Wheat Straw Fiber

TIP

Product examples from these materials (not exhaustive list): paper products, cups, bowls, utensils, tableware, straws, clamshells, etc.

Although many of these products are made to be disposable, they can often be reused several times. Some are even dishwasher safe, and most are toxic free!

[\[TIP: lookout for #dishwashersafe and #toxicfree.\]](#)

NON-SUSTAINABLE MATERIALS

PFAS (PER-AND POLYFLUOROALKYL SUBSTANCES)

"These are complex synthetic chemicals that have been used in consumer products around the world since about the 1950s, and used to make products nonstick. **They're also known as "forever chemicals" because they persist long after their usage.**"¹⁸ They're used in many takeout containers to make them leak-proof and resistant to oils. Unfortunately, PFAS don't break down in our environment or in our bodies, impacting human health and the planet.

[Learn more: www.epa.gov/pfas/pfas-explained](http://www.epa.gov/pfas/pfas-explained)

[\[TIP: CA banned paper-based food packaging containing PFAS chemicals: AB 1200: Plant-based food packaging: cookware: hazardous chemicals. Effective January 1, 2023.\]](#)

POLYSTYRENE

"Plastic that's made from petrochemicals (fossil fuels). It's used very often in food packaging in the form of clear containers, and various other types of takeout foodware."¹⁹ **This is also what Styrofoam is made from** and traditionally very common in the food packaging market. It also breaks down into little pieces (microplastics) that can harm wildlife and persist in the environment.

[\[TIP: San Diego Single-Use Reduction Ordinance banned Polystyrene effective April 1st, 2023.\]](#)

"Today, more than 97% of the U.S. population has PFAS in their bodies"²⁰

- Centers for Disease Control and Prevention (CDC)



PC: Sierra Club

CERTIFICATIONS & STANDARDS

Listed below are a variety of food packaging standards and certifications that help ensure quality materials and certified labeling practices. See below for the most commonly used ones in food packaging to help better inform your food packaging purchasing decisions.



COMPOST MANUFACTURING ALLIANCE (CMA) CERTIFIED

"Compost Manufacturing Alliance is a third-party organization that is a partnership of commercial compost facilities, as well as compostable product manufacturers. Working together, they combine lab and field tests, as well as various strategies to vet and ensure that the appropriate ASTM lab standards (ASTM D6400 or D6868) are met on certified products. CMA maintains a database of CMA certified products to help consumers and composters determine if a product is CMA certified."²¹

www.compostmanufacturingalliance.com



THE BIODEGRADABLE PRODUCTS INSTITUTE (BPI) CERTIFIED

"The BPI Certification program is a third-party verification of ASTM standards for compostable products in North America, and the starting point for every company wishing to make compostability claims on products and packaging. The BPI Certification process is rigorous and ensures that items can be cycled back into the soil safely at a commercial composting facility. Beginning in 2002, specifications and tests exist that scientifically prove a material will biodegrade, leaving no persistent synthetic residues. These standards are ASTM D6400 and ASTM D6868 which uses biodegradable coatings."²²

www.bpiworld.org



FOREST STEWARDSHIP COUNCIL (FSC) CERTIFIED:

"This organization sets the standards for responsible and ethical forest management. Their certification acknowledges that wood and paper products are made in a responsible way that reduces environmental impact. FSC certification ensures that products come from responsibly managed forests that provide environmental, social and economic benefits."²³

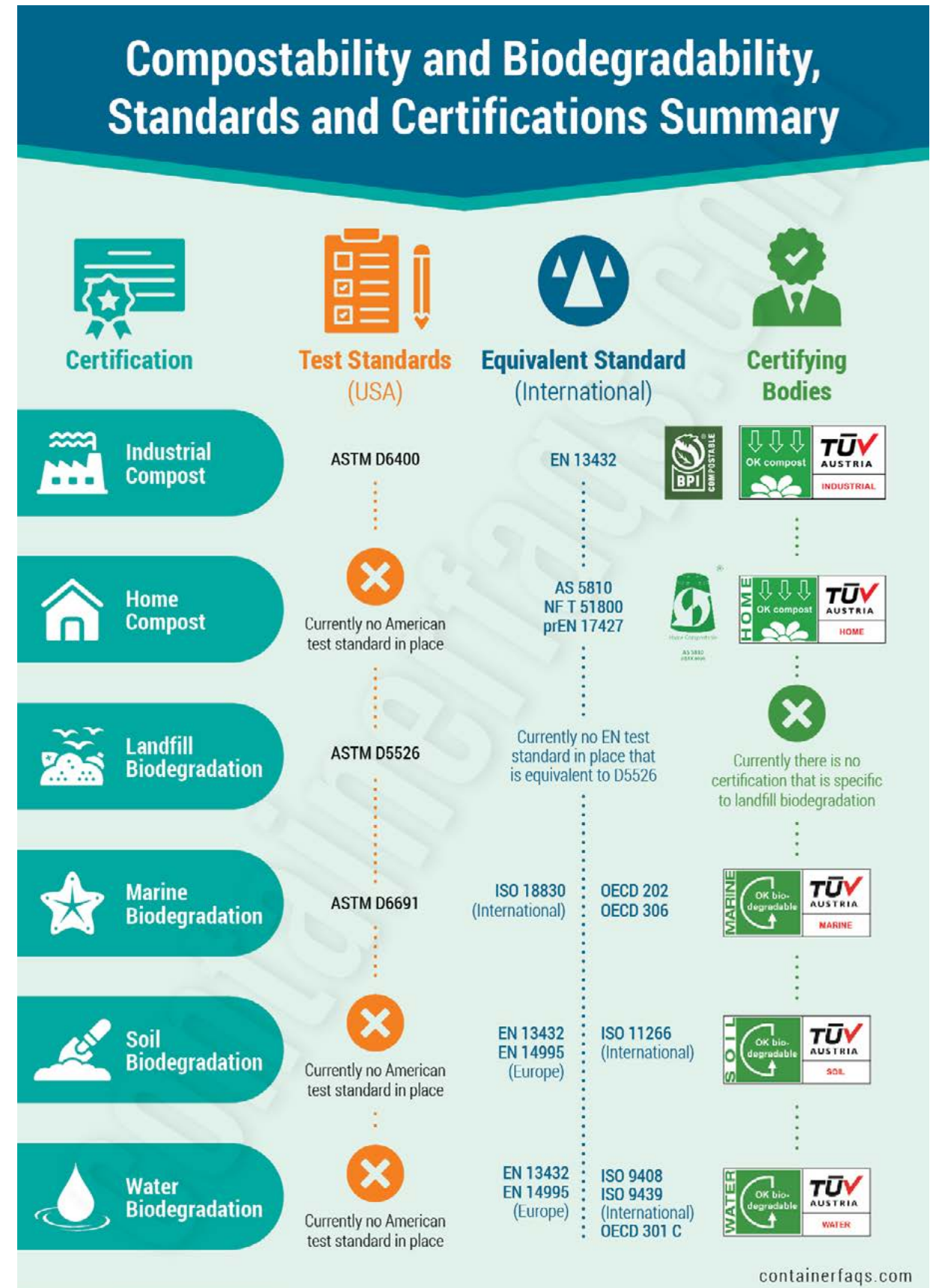
www.us.fsc.org/en-us

ASTM-D6400 STANDARD:

"Standard D6400 indicates that breakdown occurs within 180 days and that the final product yields organic compounds and is not toxic to the environment. Products must meet standards established by the American Society for Testing and Materials (ASTM) to be labeled "industrially compostable" or "commercially compostable."²⁴

ASTM-D6868 STANDARD:

"Similar to D6400, this specific standard is for the compostability of plastic films or linings/coatings attached to compostable products like food packaging."²⁵



Infographic credit: containerfaqs.com

CALIFORNIA LAWS & REGULATIONS

The laws and ordinances below are specific to California and San Diego. Use this information to better understand what you can and can't use and to make the most informed purchasing decisions.

SAN DIEGO SINGLE-USE PLASTIC REDUCTION ORDINANCE

WHAT

Most polystyrene foam containers are prohibited from distribution and sale. - *City of San Diego*:

[Learn more here.](#)

“Single use plastic (and bio-plastic) straws and utensils may only be provided upon the request of the customer.”

WHEN

The City of San Diego's Single Use Plastic Reduction Ordinance went into effect on **April 1, 2023**.

HOW IT AFFECTS RESTAURANTS

“No person or business may distribute food serviceware, food trays, or egg cartons made, in whole or in part, from polystyrene foam (styrofoam).”

ENFORCEMENT

Education-first approach.



Penalties for non-compliance would be issued as a last resort and may result in fines.

NOTE: There is an automatic waiver through March 31, 2024, for entities with gross income less than \$500,000 on their most recent Federal income tax filing.

To apply for a waiver, email: sdrecyclingworks@sandiego.gov

SAN DIEGO SINGLE USE PLASTICS REDUCTION ORDINANCE

EFFECTIVE APRIL 1, 2023

	Food vendors may only distribute plastic (and bio-plastic) straws and utensils upon the request of the customer and/or provide them at self-service stations.
	The distribution of most polystyrene foam products is prohibited. This includes food service ware such as: egg cartons, bowls, plates, trays, cups, lids, hinged containers and other similar items designed for one-time use for prepared foods, including containers for eating in, takeout food or leftovers.



Polystyrene foam, plastic utensils and straws litter the environment, harm wildlife and do not decompose or biodegrade.



The City of **SAN DIEGO**

858-694-7000 | www.sandiego.gov/pf-ban | sdrecyclingworks@sandiego.gov

Infographic credit: city of San Diego Environmental Services

Ordinance Definitions (directly from city website)

Utensils	Straw, fork, spoon, or knife made of plastic derived from petroleum or bio-plastics.
Food service ware	Containers, bowls, plates, trays, cups, lids, and other similar items, that are designed for one-time use for prepared food, including takeout food or leftovers.

SB 54 Regulatory Requirements

This packaging reform law requires by 2032:



Infographic credit: calrecycle.ca.gov

OTHER CALIFORNIA LAWS TO KNOW

- **AB 619: “Bring Your Own” Bill:** this law allows the public to bring reusable containers to restaurants for take-out. [learn more: BYO fact sheet.](#)
- **SB 1335: Sustainable Packaging for California:** ensures food service packaging fits into the state's recycling and composting systems.
- **AB 1884:** full-service food facilities provide plastic straws to customers *only upon request*.
- **AB 1276:** only provide single-use food ware accessories or standard condiments if requested by the consumer.

SB54: PLASTIC POLLUTION PREVENTION AND PACKAGING PRODUCER RESPONSIBILITY ACT

WHAT

“New packaging law to help build a circular, reuse economy that requires that by 2032:

- 100% of packaging in the state to be recyclable or compostable
- 25% cut in plastic packaging
- 65% of all single-use plastic packaging be recycled”

[Learn more here.](#)

WHEN

Governor Gavin Newsom signed SB 54 on **June 30, 2022**.

HOW IT AFFECTS RESTAURANTS

Restaurants will need to purchase sustainable packaging from vendors to comply with states goals.

ENFORCEMENT

“Producer responsibility - the legislation shifts the plastic pollution burden from consumers to the plastics industry by raising \$5 billion from industry members over 10 years.”

RESOURCES

RESOURCE TYPE	ORGANIZATION	SUMMARY	INFO
CITY & GOVERNMENT RESOURCES	City of San Diego	Business recycling	www.sandiego.gov/environmental-services/recycling/business
		Waste reduction tips	www.sandiego.gov/environmental-services/recycling/residential/consumer
		Food scrap composting	www.sandiego.gov/environmental-services/recycling/foodwaste
		Compost bin voucher program	www.sandiego.gov/environmental-services/recycling/residential/composting
WASTE REDUCTION RESOURCES	Vendor: Good Start Packaging	How to start composting at your restaurant	www.goodstartpackaging.com/how-to-start-composting-at-your-restaurant/
	Find a Composter	Composting facilities locator	findacomposter.com/
	California Against Waste	Edible food recovery/ donating surplus food	www.cawrecycles.org/donaterecyclefood
	Waste Metrics Consulting	Helps businesses eliminate overpaying for waste and recycling services	wastemetricsconsulting.com/
	The Mighty Bin (San Diego Zero Waste Store)	Resources for waste reduction	themightybin.com/pages/san-diego-sustainable-directory

RESOURCE TYPE	ORGANIZATION	SUMMARY	INFO
TECHNICAL ASSISTANCE	Chart Reuse	The industry's first foodware reuse analytics platform	www.chartreuse.eco/
	Circular	Buy, sell and ship recycled plastics at network	circular.co/
CIRCULAR ECONOMY	Upstream Solutions	Climate Action Toolkit: Reuse solutions to the climate & plastic problems	upstreamolutions.org/resources
	Ellen MacArthur Foundation	Overview of the circular economy	ellenmacarthurfoundation.org/topics/circular-economy-introduction/overview
	CalRecycle	How to approach material reuse as the first option in diverting unwanted materials from California landfills	CalRecycle.ca.gov/reuse
OTHER	Environmental Protection Agency (EPA)	Find information on recycling in your community	www.epa.gov/recycle
	How2Recycle	How to read recycling labels	how2recycle.info/
	Green Business Bureau	Sustainable food and food packaging	greenbusinessbureau.com/business-function/facilities/food-service/sustainable-food-and-eco-friendly-food-packaging/
	Surfrider Foundation	Recognize restaurants that are committed to cutting out wasteful single-use plastic.	https://www.surfrider.org/programs/ocean-friendly-restaurants

COST & BENEFITS

REUSE VS SINGLE-USE: ECONOMICS

When thinking about a reusable or disposable item, it's important to think beyond the initial cost. While disposables are inexpensive to buy initially, continually replenishing them adds up over time. Reusables on the hand, cost more up front, but can be used over and over again eliminating the need to continually purchase items.

WHAT THE CURRENT LITERATURE SAYS

ReThink Disposable: (a program of Clean Water Action and Clean Water Fund that works with restaurants to bring reuse into their operations)

"Showed that small businesses can save an average of \$3,000 to \$22,000 annually by incorporating some reusable serviceware into operations."²⁹

Use the **ReThink Disposable calculator** method below to determine your break even point for the cost of reusable items. *{TIP: The break even point is the number of uses required to recover your investment. As soon as you exceed the break even point for a particular item, you'll be saving money}.*

BREAK EVEN POINT CALCULATOR²⁷

Cost of reusable (each) = \$ _____ ÷ Cost of disposable item (each) = \$ _____

Break even point = _____ uses

Example:

Reusable cup = \$1.00 each ÷ Disposable cup = \$0.05 each

Break even point = 20 uses

After that you are saving money!

Don't feel like crunching the numbers by hand? Access the online cost benefit calculator: rethinkdisposable.org/foodware-calculator

UpStream Solutions: (supports solutions to plastic pollution by helping people, businesses and communities shift from single-use to reuse)

According to UpStream Solutions, "the evidence shows that reuse clearly beats single-use across a variety of metrics:"²⁶

METRICS

1. Reuse saves food service businesses money
2. Additional dishwashing and associated labor costs for reusables are minimal or non-existent
3. Reuse increases customer and operator satisfaction
4. Reuse builds brand loyalty
5. Reuse can offer valuable customer behavior data
6. Reuse saves communities money
7. Reuse creates new opportunities for entrepreneurs, investors and customers

[LEARN MORE HERE](#)

Infographic credit: Upstream Solutions

"These savings are accompanied by a reduction in greenhouse gas emissions, water use, pollution, and waste throughout the life cycle of products. Reusable food products and packaging produce up to 85% less carbon than their single use counterparts."²⁸

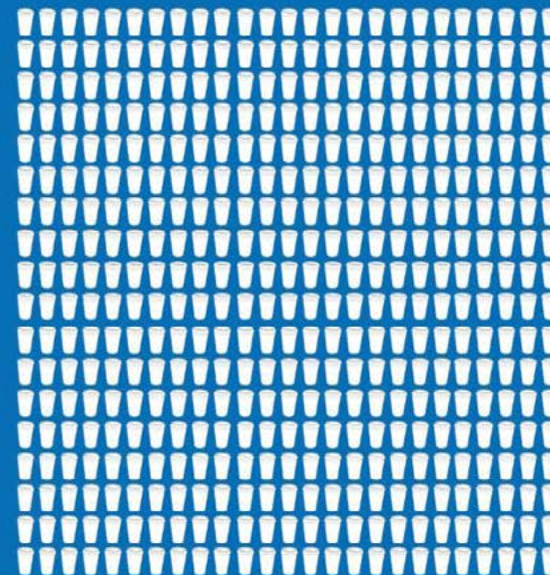
After only two washes stainless steel cutlery breaks even with disposable cutlery for environmental impacts.



After that, every use increases the environmental benefits.



Using 500 paper cups consumes nearly 370 gallons of water



Using and washing one ceramic cup 500 times consumes only 53 gallons of water



Reuse is a climate solution.  Upstream

Infographic credit: upstreamsolutions.org

APPENDIX

LINEAR ECONOMY VS CIRCULAR ECONOMY

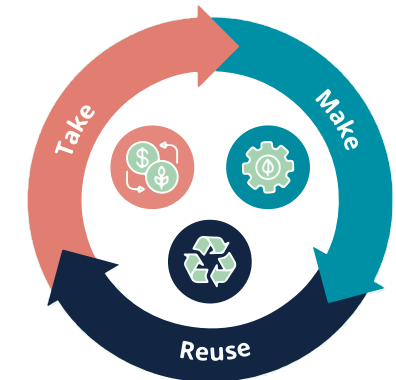
WHAT IS A CIRCULAR ECONOMY?

The circular economy redefines consumption of finite resources to sustainable use of materials that are regenerative in nature. It keeps materials in use for as long as possible and through intentional design, eliminates waste and pollution. It helps protect our environment, health, and communities by considering the entire lifecycle of our goods.

[Learn more from the Ellen MacArthur Foundation.](#)

In a report by Capgemini, "44% of consumers spend more with circular businesses and 72% of consumers want to reduce waste."³²

Circular Economy



Linear Economy



infographic credit: blog.sendle.com/guide-to-circular-economy

"In our current economy, we take materials from the Earth, make products from them, and eventually throw them away as waste – the process is linear. In a circular economy, by contrast, we stop waste being produced in the first place."³⁰ - Ellen MacArthur Foundation

HOW CAN RESTAURANTS CONTRIBUTE TO THE CIRCULAR ECONOMY?

Here are a few starter tips:

- Implement reusables whenever possible
- Choose plant-based compostable and biodegradable packaging
- Start composting at your restaurant

WHAT HAPPENS IF MY PACKAGING ENDS UP IN THE LANDFILL?

"Sustainable packaging even if disposed of improperly is designed to be better for the planet than plastics. This is because this type of packaging is made from renewable plant-based materials versus fossil fuels and can be turned into a new resource (like compost) at the end of its life. These options also reduce our collective carbon footprint."³¹

ENVIRONMENTAL & HEALTH IMPACTS

The convenience of takeout has changed the restaurant industry forever. Food delivery apps have helped to accelerate our to-go lifestyles and in turn have also increased the amount of waste created. Unfortunately, this waste is not always ending up properly disposed of and often causing harm well after its one-time use.

ENVIRONMENTAL IMPACTS

What many might not realize is how far reaching these impacts have become. Sadly, according to the US Environmental Protection Agency (EPA), **“food and food packaging materials make up almost half of all municipal solid waste.”**³³

The entire lifecycle, from how the packaging is made to where it ends up impacts our environment, communities, and health. In the U.S., the production of plastics, for example, which is used in many takeout containers, is derived from fossil fuels either from natural gas processing centers or from crude oil refineries. These plants release toxic chemicals that impact our air quality and affect our climate. They're also often found in low-income communities impacting the most vulnerable populations.

“Plastics manufacturing is responsible for a significant amount of greenhouse gas emissions in the US — as much as one percent.”³⁴ In addition, the production and transportation of these materials is created with many chemicals that can be harmful.

We also now know that after it's use, **“most packaging is discarded and is either buried in a landfill or becomes litter that is carried along by wind and water currents into the environment.”** Packaging sent to landfills, especially when made from plastics, does not degrade quickly or, in some cases, at all, and chemicals from the packaging materials, including inks and dyes from labeling, can leach into groundwater and soil.³⁵

“In the oceans, the problem has become so acute that the United Nations chief of oceans has declared **plastic pollution of our oceans a “planetary crisis.”**³⁶ Single-use products are often the culprit if not recycled because of how long they take to breakdown. When they do breakdown they often leave microplastics that leach into environment and oceans.



PC: istock photo



PC: istock photo

“Widespread plastic contaminants such as food containers and wrappers, single-use bags, and plastic bottles are the most widespread pollutants of the seas, making up almost half of human-made waste.”³⁷

- The Guardian

HEALTH IMPACTS

We now know that the chemicals used in plastic takeout packaging can also impact our health. When hot foods are put into containers, chemicals can leach into the food and, in turn, our bodies.

“Microplastics from the containers themselves flake off into the food, accounting for 30 percent of the plastic intake from those foods, according to a study in The Journal of Hazardous Materials.”³⁸ As noted by the EPA, “these chemicals are linked with hormone interference and can reduce fertility in both men and women.”³⁹ There's also many other chemicals in plastic that can impact our bodies.

PFAS, mentioned earlier in this guidebook, are commonly found in many containers for their nonstick properties. However, these chemicals can cause harm over time. **While these are now banned in California food packaging,** there persistent nature still impacts our communities. **“PFAS has been shown to cause reproductive, developmental, liver, kidney and immunological problems in laboratory animals. It may also be associated with low birth rate and thyroid disruption, according to the Environmental Protection Agency.”**⁴⁰

With any chemical we have contact with, its influence in our bodies and our health depends on a host of factors including pathway exposure and time to name a few. While we're still learning what the long-term health impacts will be, we should be cautious and continue to explore sustainable alternatives.



Infographic credit: toxicfreefuture.org



PC: istock photo

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Pit & Seed

RESTAURANT TYPE

» Reusable Take-Out Service

ABOUT

Pit & Seed serves meals from local restaurants in reusable takeout containers in San Diego. With one marketplace, customers can purchase meal prep foods and/or prepared meals for delivery. *All food is served in reusable containers.*



"Customers save time, money, and waste, and support their local community and environment all with Pit & Seed services"

TRANSITION:

Pit & Seed started as an eatery offering healthy plant-based meals. Their original vision was to create a sense of community combined with convenience. In their journey towards becoming more sustainable, they ran into various challenges primarily with waste and packaging that didn't fit their values.

Since they felt they came up short with sustainable packaging options they decided to pivot their business and **launch a reusable delivery program**. This business model allowed them to partner with local restaurants and offer customers their favorite food (in addition to their own!) *without all the waste*. They handle all the operations—delivery and pick up and washing services. Partnering restaurants store Pit & Seed reusable containers at their restaurants and use them for all Pit & Seed orders.

CHALLENGES/SUCCESS

- Getting the word out - they partner with La Jolla farmers market for outreach to community.
- Maintaining and implementing sustainable practices as they scale.
- Finding plastic alternatives for their reusable containers.

Serving most neighborhoods in the San Diego:
see website for coverage area: www.pitandseed.com

SUSTAINABILITY PRACTICES

- Packaging is reusable, and thoroughly sanitized between uses
- Working within local communities allows for weekly batch deliveries helping to lower carbon emissions
-  **Ocean Friendly Restaurant**
"proud to work with the Surfrider Foundation to help partner restaurants have ocean-friendly practices!"

TIPS/RECOMMENDATIONS

"Start with packaging and food waste"

(biggest contributor to waste)

- Barrett Fisher, Co-Founder, Pit & Seed

Are you a restaurant interested in partnering?

619-914-2674 / barrett@pitandseed.com



JAMES COFFEE CO.

RESTAURANT TYPE » Coffee Shop

ABOUT

Specialize in producing handcrafted, artisan roasted coffee. They offer a revolving assortment of distinctive single-origin beans as well as exclusive James Coffee crafted blends. Locations: Little Italy, Bankers Hill, North Park, Escondido, and wholesale.



“Bans will help propel the reusable economy forward”

TRANSITION:

James Coffee was motivated to transition by learning how much trash is produced by coffee shops. **“58 billion paper cups are tossed out annually in the U.S. alone.”**¹ The amount of waste from disposable coffee cups made them look to see where they could make improvements. Their reusable glass jar program was born in 2021 and inspired by the owner’s travels to other countries where these types of programs already existed.

They now offer reusable jars across all their locations (serving hot and cold coffee). The way it works: consumer purchases a reusable glass jar for coffee and return it to get a deposit back or credit towards their next coffee purchase. It’s 100% recyclable and reusable with a branded koozie (minimal deposit of \$1.50). James Coffee handles the sanitation, customers just bring it back and receive a clean jar!

CHALLENGES/SUCCESS

- **Consumer behavior shift** - lost some customers initially but others became very loyal. Now offer hybrid, paper and reusables.
- **Supply chain challenges** - COVID-19 made it challenging finding the right supplier for their program but now have everything working smoothly.
- **Cost factor** - goes to the customer initially then eventually pays itself off. Incentives and discounts encourage reuse.

SUSTAINABILITY PRACTICES

- Serving coffee in reusable glass (mason) jars
- Working to make coffee bags more sustainable — either recyclable or compostable
- Supplying coffee to other coffee shops, & working with them to reduce waste

 [Ocean Friendly Restaurant](#)

TIPS/RECOMMENDATIONS

“If you’re a coffee shop interested in trying something similar, James Coffee is happy to work with you to make it happen! The more people that do it the more acceptable and normalized it will become.”

- Carina Kennedy, Managing Member, James Coffee

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Interested in learning more or starting your own reusable program?

jamescoffeeco.com/pages/reuse

JUNE SHINE

RESTAURANT TYPE

» Hard Kombucha Brewery

ABOUT

JuneShine makes and sells hard kombucha & canned cocktails. They fell in love with the refreshingly smooth taste of jun kombucha and have made it their mission to brew the highest-quality, healthiest jun kombucha there is. (Products in multiple grocery stores across San Diego, and have a number of tasting rooms: Juneshine Ranch, Santa Monica, New York, & looking to expand.)



“Honest alcohol for a healthier planet”

TRANSITION:

Sustainability is a main pillar of Juneshine and drives their business decisions and operations. They were inspired to create a brewery with a focus on healthy ingredients and sustainable operations. During their transition they managed to reduce their trash and recycling bins to 1 from 12 and as a result, reduce their waste collection bills.

They also started a co-op with other breweries to collect and recycle hard-to-dispose-of plastic #4 & #5 and sell this back to the supply chain. They now have 10 different brewers that participate and supply them with their waste to be recycled. They also eliminated plastic 6-pack rings and paktech, and now only sell in paper cartons. They took a holistic approach to see where they could eliminate plastics in their operations.

CHALLENGES/SUCCESS

- **Operations overhaul** - they understood that waste reduction required a lot of operational effort and knew intentional planning would make a big impact.
- **Supply chain challenges** - in the beginning it was the production facility and getting the proper equipment to pack cans.
- **Storage space challenge** - finding storage space, especially for larger order quantities as well as working with different suppliers was challenging, but by reducing waste and increasing efficiency it helped them free up space.

SUSTAINABILITY PRACTICES

- Limits plastic throughout entire production cycle
- Uses 100% sustainable and healthy ingredients
- Composts & recycles on-site
- Plants trees to replace those that were used to make paper cartons

TIPS/RECOMMENDATIONS

“Start by digging into the supply chain—identify areas where change can happen. This will provide a holistic overview of operation opportunities. Consider consumers, because many would prefer zero waste options even if that means driving up cost.”

- Luke Suttmiller, Head Brewer/Sustainability Lead, Juneshine

Learn more about their journey:
juneshine.com/pages/about