LEADING THE CHANGE

Corporate Responsibility and Reuse Solutions
for Japan's Convenience Store and Café Chains
November 2024

GREENPEACE

Leading the Change.

Corporate Responsibility and Reuse Solutions for Japan's Convenience Store and Café Chains

PUBLISHED NOVEMBER 2024

Greenpeace is a network of independent organisations which uses peaceful, creative confrontation to expose global environmental problems and develop solutions for a green and peaceful future.

SUGGESTED CITATION
Greenpeace Japan. 2024. "Leading the Change. Corporate Responsibility and Reuse Solutions for Japan's Convenience Store and Café Chains".

Authors & Contributors
Lea Gajewski
Hiroaki Odachi
Michelle Plotts
Jeffrey Albertson-Kwok
Coco Wu

Principal Investigator for the LCA
Dr. Meike Sauerwein
Research Co-Lead of LCA study for the *Reusable is Futurable* report, Hong Kong University of Science and Technology

External Reviewers
The authors are grateful for the external expert review provided by:
Tomohiro Tasaki (Head of Material Cycles and Social Systems Research Section, National Institute for Environmental Studies) and **Harada Sadao** (Associate Professor, Faculty of Economics, Doshisha University). Their insights and feedback have significantly enhanced the quality of this work.

Design & Layout:
Parker Huang
Misy Tinyun Lan
Qian Han

Acknowledgement
We would like to express our sincere gratitude and appreciation to all who gave invaluable input and helped with editing the text.

Tokyo Office
Tsao Hibiya 12F, 3-3-13 Shinbashi, Minato-ku,
Tokyo 105-0004, Japan
Tel: +81 (0)3-4334-6986
E-mail: kouhou@greenpeace.org

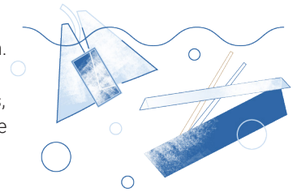
PLEASE CONSIDER THE ENVIRONMENT BEFORE PRINTING THIS PUBLICATION.

LEADING THE CHANGE

Table of **CONTENTS**

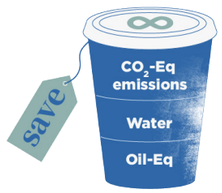
KEY FINDINGS

The production, use, and disposal of single-use packaging is taking a toll on our environment, endangering wildlife, and jeopardising human health. Despite the growing evidence of its detrimental impacts, the food and beverage sector, including major chains like Seven-Eleven and Starbucks, fail to disclose or take adequate steps to reduce the amount of single-use packaging they generate annually.



In this report, Greenpeace Japan delves deeper into the practices of three major café chains and three convenience store chains to reveal the extent of single-use packaging waste produced by these establishments. Alarmingly, Starbucks, Tully's Coffee, and Pronto collectively emitted over 474 million single-use cups in 2023, while the three convenience stores, Seven-Eleven, FamilyMart, and Lawson, were responsible for 1.9 billion cups and more than 19.900 metric tons of other food packaging waste in FY 2023.

To tackle this issue effectively, businesses must acknowledge their corporate responsibility and work towards comprehensive and truly sustainable changes. Although the solutions are manifold, shifting away from single-use packaging and prioritising reduction and reuse-and-refill schemes, such as rental-reuse options, are imperative.



Estimates by Greenpeace Japan in collaboration with Dr. Meike Sauerwein, make clear the environmental benefits achievable if convenience stores and café chains were to employ a rental-reuse model for their takeaway beverage cups. By switching to reuse, these six major chains could collectively save 88 million kg of CO_2-Eq emissions, 465,000 m^3 of water and 37 million kg of oil-Eq.

Plastic art installation near the Shaw Center for the start of the fourth session of the Intergovernmental Negotiating Committee (INC-4) meetings in Ottawa, Canada.

CHAPTER 1
INTRODUCTION

Single-Use **Packaging**

Globally, projections indicate that annual plastic flow into the oceans could nearly triple by 2040, reaching 29 million metric tons annually.[1] Marine life is already threatened, from turtles becoming entangled in plastic debris to whales ingesting it.[2,3] Japan is not immune to this crisis; from the clouds hanging atop Mount Fuji to its coastal waters and to the depths of Lake Biwa, plastic pollution has reached faraway corners of Japan.[4,5,6] Despite increasing awareness of environmental damage, our society continues to prioritise business as usual over sustainability. Regrettably, the government and corporations remain slow to implement meaningful change.

Beyond these well-documented visible impacts, the negative ramifications of plastics extend throughout their lifecycle–from extraction to disposal–posing greater, and often overlooked threats to both the environment and human health 99% of plastics are derived from fossil fuels,[7] and their extraction and production release a spectrum of toxic chemicals into the surrounding air and waterways.[8,9,10,11,12,13] Communities living in close proximity to petrochemical plants have been shown to have an increased risk of cancer and respiratory disorders[14,15,16]

When plastic reaches its end-of-life stage, most of it ends up in landfills or the environment. Since 1950, 76% of plastic waste globally has been disposed of in this manner, with only 10% being recycled.[17] Japan's official recycling rate is slightly higher at around 22% for material recycling and 3% for chemical recycling. However, about one-third of the plastic intended for material recycling is not recycled domestically but is instead exported to mostly non-OECD countries.[18,19,20] In fact, in 2023, Japan exported over 500,000 tonnes of plastic waste, making it the number one exporter to non-OECD countries globally.[20] Importing countries like Malaysia, Vietnam, and Thailand, often lack adequate facilities to handle and recycle this waste properly, raising concerns about mismanagement and negative impacts on local communities. This shift of responsibility from high-income countries to low-income countries raises significant ethical concerns regarding equity and environmental justice.[21,22,23] Even if recycling rates were to improve and recycling overseas closely regulated and monitored, one fundamental flaw in the recycling process persists: it accelerates the degradation of plastic materials, allowing them to be recycled only two or three times before they must ultimately be disposed of.[24] This means that recycling, rather than removing the need for final disposal, often only delays it.

In recent years, bio-based and biodegradable plastics, as well as paper substitutes, have emerged as potential alternatives.[25] However, material substitution risks shifting the problem from one area to another. It increases demands on agricultural lands and forests, potentially causing deforestation, intensive agricultural practices, and land-use changes that harm ecosystems. [25,26,27]

Given the limitations and risks of recycling and material substitution, the solution is clear. Governments and businesses must address the root causes of plastic pollution by shifting away from a throwaway culture and unsustainable consumption patterns towards systems focused on the principle of Reduce and Reuse.

Global Shift Towards **Reuse Systems**

In November 2024, delegates from around 175 countries are expected to convene in Busan for the INC5, a pivotal event aiming to establish a comprehensive global treaty to combat plastic pollution. If successful, this treaty could be the first to holistically tackle the issue on a worldwide scale, bringing about significant systemic change. These negotiations have been long anticipated, also driven by civil society's demand for more substantial action against plastic pollution.

Several countries are already leading the way with innovative reduce and reuse schemes, showcasing practical approaches to minimising waste and promoting sustainability. Rwanda, for instance, became the first African nation to ban single-use plastics, setting a powerful example for other countries.[28] In the European Union, new regulations will ban certain single-use plastic packaging for food and beverages consumed in cafés and restaurants. For takeaway items, these establishments are encouraged to offer 10% of their products in reusable packaging while also providing consumers with the option to use their own containers.[29] Prior to this, France enacted ambitious reduce and reuse regulations under its 2020 landmark Anti-Waste Law, which aims to eliminate all single-use plastics by 2040. As part of this effort, since since January 2023, food and beverage chains have been required to use reusable cups, plates, containers, and cutlery for dine-in services. The law also promotes the sale of products without any packaging and recognises the consumers' right to use their own containers when shopping, provided the necessary sanitary requirements are met.[30,31]

Reuse schemes are diverse, from food and beverage chains offering their products in reusable alternatives or allowing customers to bring their own reusable cups to collaborating with third-party operators that provide and manage reusable containers.[32] While environmental impacts vary depending on the reuse scheme, material, transportation, washing practices, and reuse frequency, reusable alternatives have been shown to be more environmentally friendly under the right conditions. [33,34,35,36] A 2023 study by Greenpeace East Asia, focusing on actual data from urban rental reuse service providers, demonstrated that a reuse cup system environmentally outperforms its disposable counterparts even at lower usage rates, showing that switching 3.91 billion single-use cups to rental reuse could save 793,000 m^3 of water, 60.3 million kg of CO_2-Eq and 1.2 million kg of oil-Eq.[37]

Despite this global momentum and growing scientific evidence, Japan lags behind in implementing substantial changes. While the country promotes the concept of 3R (Reduce, Reuse, Recycle), the emphasis has been predominantly on recycling. The Plastic Resource Circulation Act, which came into effect in 2022, requires large businesses to reduce their use of single-use plastics. However, it covers only 12 items, such as spoons and forks offered at supermarkets and convenience stores, and leaves the implementation of specific reduction measures largely to the businesses themselves.[38] This limited scope, as well as the lack of clarity on how much reduction can be expected, barely scratches the surface of the problem. The widespread use of single-use products and packaging in convenience stores, café chains, and the broader food and beverage industry continues unabated, contributing to Japan's reputation for excessive packaging.

In this report, Greenpeace Japan looks at the magnitude of single-use waste in two critical sectors: café chains and convenience stores. We updated our analysis of three major café chains, examining their volume of single-use cups discarded three years after our previous study, *Disposable Cups in the Japanese Café Industry*.[39] We also expanded our research to cover convenience stores, estimating not only the volume of single-use cups but also the amount of single-use packaging waste generated by other popular food items such as bento boxes and onigiris. In the final chapter, we envision the environmental savings of introducing a rental reuse system for takeaway cups in both cafés and convenience stores, as assessed through a Life Cycle Assessment (LCA).

© Chihiro Hashimoto / Greenpeace

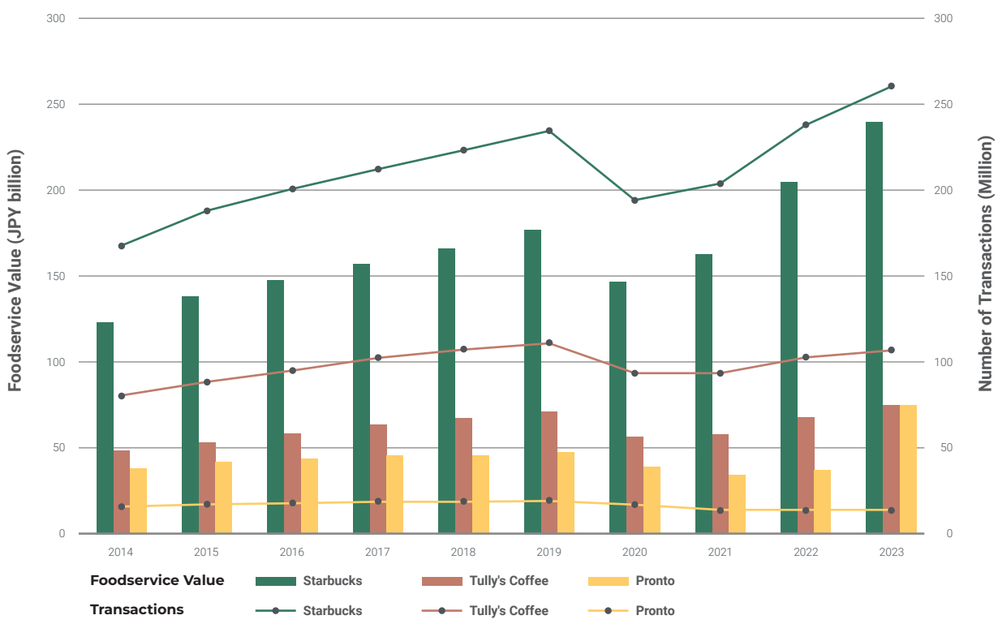
CHAPTER 2

SINGLE-USE CUPS
IN CAFÉ CHAINS IN JAPAN

Café chains have played and continue to play a significant role in perpetuating the throwaway culture. In our previous report, *Disposable Cups in the Japanese Café Industry*, we examined the reuse practices of nine major café chains: Starbucks, Komeda, Doutor, Tully's Coffee, Pronto, Excelsior Caffé, Caffé Veloce, Ueshima Coffee House, and Café de Crié, and estimated the volume of single-use cups they generated in 2020.

During our previous analysis, the food and beverage sector was grappling with the challenges posed by the COVID-19 pandemic. Measures such as lockdowns, social distancing, and the widespread shift to remote working significantly reduced customer traffic, resulting in a sharp decline in sales and transactions. Recent findings from Euromonitor International's *Cafés/Bars in Japan* report indicate a gradual recovery in the sector over the past few years (Graph 1).[40] In response, Greenpeace Japan has re-examined the cup waste landscape, focusing on the three largest contributors identified in our previous report—Starbucks, Tully's Coffee, and Pronto—to determine whether the adoption of reusable cups has increased and the reliance on single-use cups has decreased.

Brand shares of Starbucks, Tully's Coffee, and Pronto in Terms of Foodservice Value and Number of Transactions.



Graph 1: Brand shares of Starbucks, Tully's Coffee, and Pronto regarding foodservice value and number of transactions between 2014 and 2023. Data sourced from Euromonitor International.


gowithstock/Shutterstock

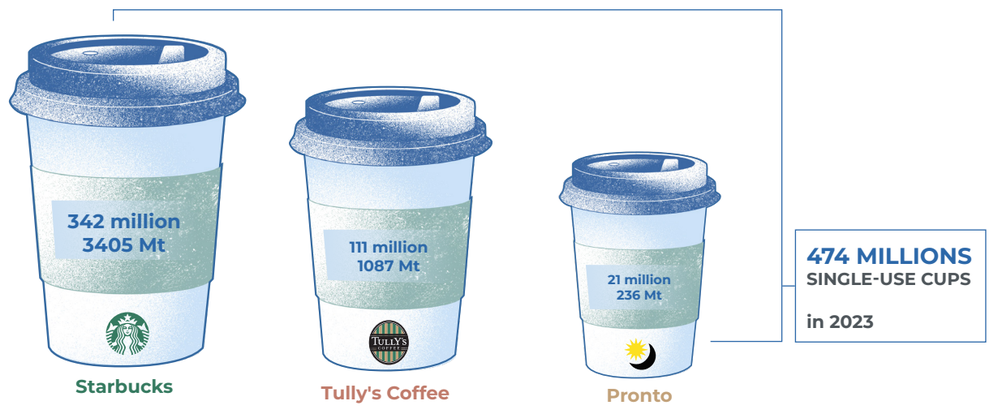
Henry Saint John/Shutterstock

According to Greenpeace Japan's new analysis, Starbucks, Tully's Coffee, and Pronto sold **474.8 million single-use cups** in 2023. This figure not only surpasses the total number of single-use cups sold by these three chains in 2020 by more than 130 million cups but also exceeds the combined sales of all nine chains analysed in 2020. Starbucks is again the biggest emitter, with 342.0 million cups, followed by Tully's Coffee with 111.4 million cups and Pronto with 21.3 million cups (Table 1).

Table 1: Shows the total number of single-use cups sold by Starbucks, Tully's Coffee, and Pronto in 2023 and 2020 in million (M) and the total amount in metric tons (Mt) in 2023. The total number of single-use cups for 2023 is divided into paper and plastic cups for dine-in and takeaway services. Values may not sum precisely due to rounding; values have been rounded down to the nearest whole number.

Name of the chain	Number of single-use cups in 2023 (M)					Total number of single-use cups in 2023 (Mt)	Total number of single-use cups in 2020 (M)
	Takeaway		Dine in		Total		
	Plastic	Paper	Plastic	Paper			
Starbucks	134.4 (39.9%)	129.1 (37.8%)	28.2 (8.3%)	50.1 (14.7%)	342.0 (100%)	3,405.5	231.7
Tully's Coffee	19.7 (17.7%)	19.0 (17.1%)	26.1 (23.5%)	46.5 (41.7%)	111.4 (100%)	1,087.1	72.5
Pronto	1.3 (6.3%)	1.5 (7.4%)	18.4 (86.3%)	0.0*	21.3 (100%)	236.9	35.3
Sum	155.5	149.7	72.8	96.6	474.8	4,729.6	339.5

* Categories in which no single-use cups (paper or plastic) were observed within the limits of reporting.



Starbucks

In 2020, Starbucks experienced a significant decline in the number of transactions and foodservice value due to the COVID-19 pandemic. Since then, the company has not only recovered but also surpassed pre-pandemic levels in Japan. Moreover, a substantial increase in single-use cups sold in 2023 has accompanied this recovery. With **342.0 million cups**, Starbucks alone emitted nearly as many single-use cups as all nine café chains combined did three years earlier.

To assess changes in reuse rates for dine-in services, Greenpeace Japan conducted a survey in May 2024, visiting 40 Starbucks locations in high-traffic urban areas such as Shinjuku, Ueno, Akihabara, and Shinbashi. The survey revealed that the majority of beverages were still served in single-use cups: **76%** of drinks were provided in paper or plastic cups, with only 24% in reusable cups (see Table 2). This represents a significant decline from the 41% reuse rate observed in a nationwide citizen science survey conducted by Greenpeace Japan in August 2023.[41] The disparity suggests considerable differences in the adoption of reusable cups between different stores and locations. Given the limited sample size of the 2024 survey, these findings may not fully capture the overall trend across the Starbucks chain. Therefore, the number of single-use cups was estimated using the higher 41% reuse rate from 2023. Nevertheless, the observed low reuse rate is worrisome, highlighting a need for increased efforts to promote reuse across all Starbucks stores.

For takeaway services, Starbucks has piloted a reusable cup system at over a dozen locations in Tokyo in 2021. Following this, Lawson has temporarily participated in a reusable cup trial, but a large-scale reusable cup scheme for takeaway purchases does not yet exist.[42] Currently, Starbucks has implemented a reuse system in 38 of its over 1,900 stores.[43] While only Starbucks is actively promoting the introduction of reusable cups and gradually making progress, it is essential to implement and facilitate rental reuse options more widely to effectively reduce single-use cup consumption.

Tully's Coffee

Tully's Coffee, akin to Starbucks, faced significant challenges during the pandemic, but has shown signs of recovery. Presently, its total foodservice value and number of transactions are nearing pre-pandemic levels. However, that recovery came at the expense of increased single-use cup emissions, worsened by the company's inactivity in implementing reuse schemes. In 2023, Tully's Coffee sold **111.4 million** single-use cups, nearly 40 million more than in 2020. In addition, Greenpeace Japan's in-store observations in May 2024 have revealed a concerning trend. The number of drinks served in reusable cups has markedly decreased, with the reuse rate dropping from 12% observed in the nationwide citizen science survey in August 2023 to **7%** in May 2024 (Table 2). Tully's Coffee is currently utilising single-use cups for around 93% of dine-in, and 100% of takeaway beverages. These findings highlight a significant gap between the company's stated commitment of promoting reusable mugs and glasses for dine-in customers and the actual implementation of these efforts.[41] The combination of post-pandemic increased beverage sales and decreased reuse rates has led to an increase in single-use cup waste. Unlike Starbucks, which has made initial strides towards implementing reuse systems, Tully's Coffee has yet to make any commitments towards promoting reusable options for takeaway beverage sales. To effectively address this growing waste issue, Tully's Coffee must not only follow through on its commitment to reusable options for dine-in services but also take more decisive actions to adopt reusable schemes for takeaway services.

Pronto

In 2020, Pronto ranked third among nine coffee chains, using 35.3 million single-use cups. By 2023, this number declined to **21.3 million single-use cups**, making Pronto the only chain among the top three to show a decrease. Despite the reduction in single-use cup usage, this change cannot be attributed to a shift in Pronto's policy.

In-store observations confirmed that Pronto has not modified its practices: beverages sold for takeaway and cold beverages for dine-in are still provided in single-use cups. While hot beverages for dine-in consumption are served in reusable mugs, the continued use of disposables for cold drinks significantly contributes to the overall single-use cup count. According to data from Euromonitor International, Pronto experienced a decline in the number of transactions in 2023 compared to 2020, while overall sales slightly increased. This increase in sales is primarily due to inflation and the resulting price adjustments made by the chain. Japan's Consumer Price Index (CPI) for food rose from 100.0 in 2020 to 112.9 in 2023, indicating an inflation of 12.9% over the three-year period.[44] A higher CPI typically indicates increased prices for food products, and indeed, a comparison of receipt data from 2020 and 2023 confirms that Pronto raised the prices of many items during this period. The decline in the number of single-use cups sold is thus largely attributable to the overall decrease in the number of transactions. Additionally, our analysis of receipt data indicates a shift in customer preferences toward purchasing more food items rather than beverages in 2023. Among the beverages that were purchased, the proportion of dine-in consumption increased from 86% in 2020 to 92% in 2023 (Table 3). Since hot beverages ordered for takeaway are served in disposable cups, while those consumed in-store are served in reusable mugs, this slight shift has also contributed to the reduction in the overall number of disposable cups. In other words, the decline in Pronto's use of single-use cups is primarily due to a decrease in beverage sales and a shift toward more dine-in consumption, rather than a proactive policy change by the chain. Although the company has indicated plans to use reusable glassware for dine-in customers, this practice has not yet been widely implemented.[45] The ongoing reliance on single-use cups, particularly for cold beverages, highlights an area where further improvement is urgently needed.

Table 2: Shows the reuse rate for dine-in services for three of Japan's major café chains (%) for August 2023 and May 2024. The numbers for 2023 are derived from the nationwide citizen science survey conducted by Greenpeace Japan.[41]

Name of the chain	Dine-in reuse rate in 2023 (%)	Dine-in reuse rate in 2024 (%)
Starbucks	41	24
Tully's Coffee	12	7
Pronto	/	42

Table 3: Shows the foodservice value for dine-in and takeaway purchases for three of Japan's major café chains (in %). Values may not sum precisely due to rounding.

Name of the chain	Foodservice value for 2023 (%)		Foodservice value for 2020 (%)	
	Dine-in	Takeaway	Dine-in	Takeaway
Starbucks	34	67	38	62
Tully's Coffee	68	32	68	32
Pronto	92	9	86	14

METHODOLOGY

The The methodology for estimating the number of cups emitted by café chains remained consistent with the approach used in our previous report, with slight adjustments made to enhance its relevance and timeliness for this study. Detailed changes in the research scope are provided below. For a comprehensive understanding of the entire methodology, please refer to the *Disposable Cups in the Japanese Café Industry* report from 2022. The analysis is based on several key assumptions, so Greenpeace Japan contacted all six chains (three convenience store chains and three café chains) to seek their views on the survey results and, if possible, to request their own usage estimates. All companies responded, but as of the report's publication, five companies did not provide supporting information, instead responding that such data is "not disclosed" or that they "cannot disclose sales-related data." Regarding the three café chains, Starbucks shared an overview of its previous initiatives and a reaffirmation of already published figures on reductions achieved through in-store reuse measures. The only company to provide data on annual disposable cup consumption was Tully's Coffee, which, however, expressed a desire not to disclose it in the report. The annual consumption figure provided by Tully's Coffee was lower than Greenpeace's estimate.

DATE ANALYSIS

Selected Chains

This study selected three major food and beverage chains. These chains were chosen based on their previous levels of single-use cup emissions, as calculated by Greenpeace Japan in the *Disposable Cups in the Japanese Café Industry* report from 2022. Market share data corresponding to these chains was sourced from Euromonitor International. The names of the chains and their corresponding market shares for the year 2023 are listed in Table 4.

Table 4: The three major café chains investigated in this study, along with their respective market shares (%), either in terms of foodservice value or number of transactions.

Name of the chain (English)	Name of the chain (Japanese)	Market share in 2023 (%)	
		Foodservice value	Number of transactions
Starbucks	スターバックスコーヒージャパン	14.9	16.4
Tully's Coffee	タリーズコーヒー	4.7	6.7
Pronto	プロント	2.7	0.9

Timeframe

This study examined single-use cup usage within the Japanese café sector in 2023.

Date Sources

The The data were obtained from multiple sources, consistent with the previous report. The 2023 market share data were derived from Euromonitor International's most recent *Cafés/Bars in Japan* report, while customer consumption patterns were analysed from receipt data provided by WED 株式会社. A minimum of 500 randomly selected receipts for each chain in 2023 were analysed, ensuring a confidence level of at least 95% with a maximum 5% margin of error.

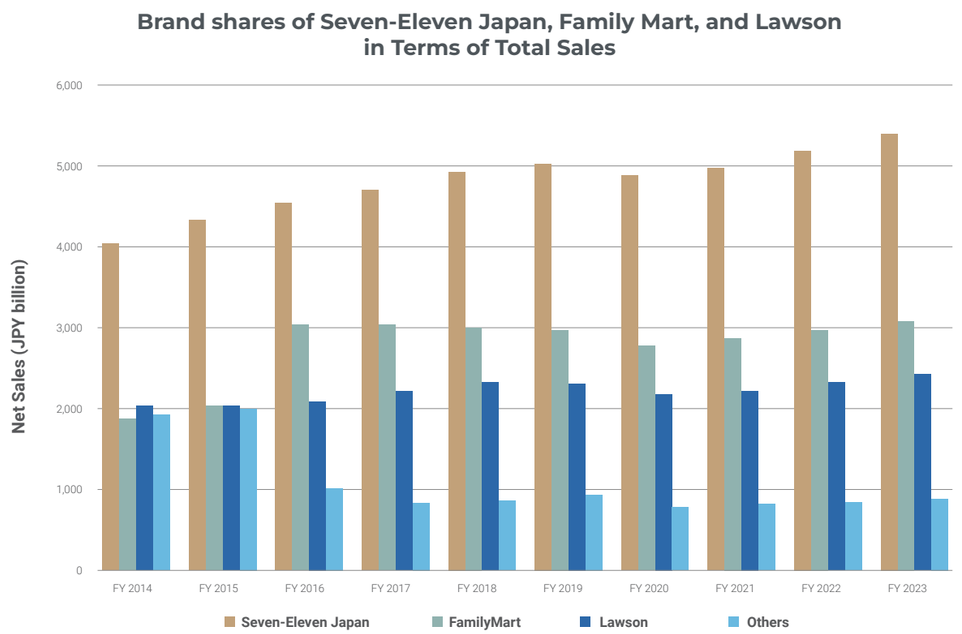
Chain-specific reuse rates for Starbucks and Tully's Coffee were derived from a 2023 citizen science survey by Greenpeace Japan.[41] For Pronto, reuse practices for dine-in customers were re-evaluated in May 2024 through visits to 10 stores, where it was observed that iced drinks were served in plastic cups and hot drinks in reusable mugs. Additionally, field data collected by Greenpeace Japan in May 2024 included observations at a minimum of 40 stores each for Tully's and Starbucks. The 2024 reuse rates were included in the report for reference but were not used to estimate the total number of single-use cups.

CHAPTER 3

SINGLE-USE PACKAGING

IN CONVENIENCE STORES IN JAPAN

Convenience stores have long been an integral part of the Japanese lifestyle, offering quick and easy access to various products. As of February 2024, Seven-Eleven operated more than 21,000 stores nationwide, making it the largest player in the sector.[46] FamilyMart follows closely, with over 16,000 outlets, and Lawson, excluding its Natural Lawson and Lawson Store 100 formats, runs over 13,000 stores.[47,48] Unfortunately, the business model of these stores is centred around convenience, relying extensively on single-use packaging. Given that Seven-Eleven, FamilyMart, and Lawson together account for 92% of the market's total sales (Graph 2)[46], they not only play a major role in perpetuating the current throwaway culture but also hold a unique opportunity to drive positive change. By adopting sustainable practices, these chains could substantially reduce single-use packaging waste and spearhead a transformation across the sector.

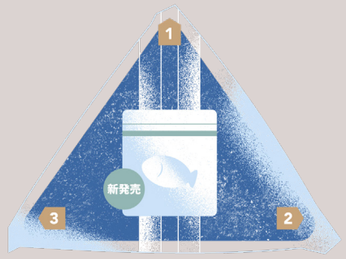


Graph 2: Brand shares of Seven-Eleven Japan, FamilyMart, and Lawson showing total sales between 2014 and 2023. Data were sourced from Seven & I Holdings Co., Ltd.'s annual *Corporate Outline* report.

Despite their market dominance, these companies' sustainability efforts often appear more symbolic than impactful. Initiatives such as reducing the weight of disposable spoons fail to significantly address the overarching problem of single-use packaging. Furthermore, the industry is plagued by a lack of transparency, with reduction targets that are often vague and unsupported by concrete data on the volume of waste produced or the specific reduction goals set for the coming decades.

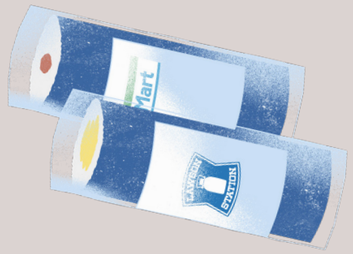
In response to these issues, Greenpeace Japan conducted an in-depth analysis of single-use items— bento boxes, onigiris, sushi dishes, and beverages—sold by these convenience stores during the fiscal year 2023.

KEY PRODUCT CATEGORIES IN CONVENIENCE STORES



ONIGIRI

Onigiri are rice balls typically shaped into triangles, wrapped in seaweed, and filled with various ingredients like pickled plum, grilled salmon, or seasoned cod roe.



SUSHI DISHES

Sushi dishes include maki rolls (rolled sushi) and nigiri (slices of fish atop rice).

BENTO BOXES

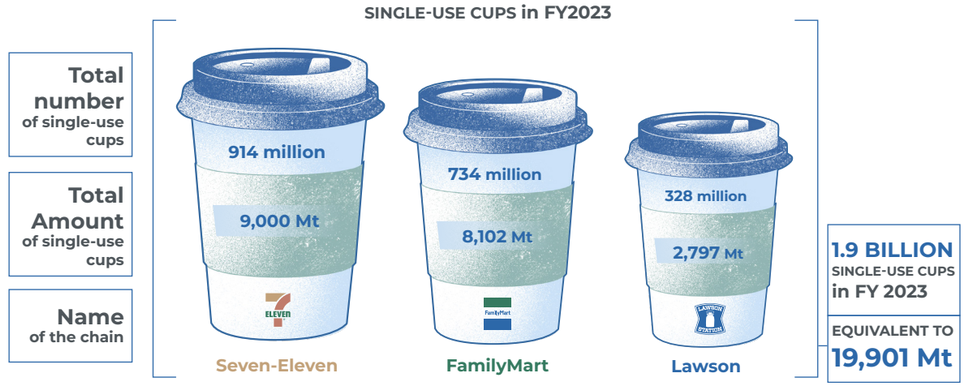
Bento boxes are single-portion meals featuring a balanced assortment of rice, vegetables, and proteins such as fish, meat, or tofu.

BEVERAGES

This category only includes ready-to-drink and over-the-counter beverages, such as hot and iced coffee and frappés.

Single-Use **Cups**

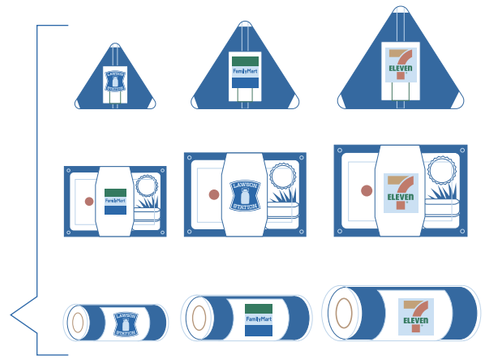
The analysis revealed staggering figures for single-use cups. In fiscal year 2023 alone, Seven-Eleven sold approximately 914 million single-use cups, FamilyMart sold 734 million, and Lawson sold 328 million. Collectively, these three companies are responsible for the distribution of approximately **1.9 billion single-use beverage cups in just one year**.



Single-Use **Food Packaging**

The calculations for the single-use food packaging categories revealed that during fiscal year 2023, the three convenience store chains collectively sold **3.4 billion onigiris, 811 million bento boxes, and 511 million sushi dishes.**

Of Seven-Eleven accounted for the largest share, with sales of 1.6 billion onigiris, which represents 47% of the total onigiris sold by the three chains combined. For bento boxes, Seven-Eleven sold 491 million, accounting for 60% of the total, and 248 million sushi dishes making up 49% of the total. FamilyMart and Lawson followed, with FamilyMart selling 1.1 billion onigiris (34% of the total), 157 million bento boxes (19% of the total), and 223 million sushi dishes (44% of the total), while Lawson contributed 650 million onigiris (19% of the total), 163 million bento boxes (20% of the total), and 40 million sushi dishes (8% of the total).



These figures, though substantial, represent merely the number of individual products sold. Many of these food items are typically encased in multiple layers of single-use packaging. For instance, depending on the chain, bento boxes may typically be composed of 3 or 4 separate packaging components. These components may include outer plastic wrapping, individual compartments for different food items, small containers for condiments, and even decorative elements such as plastic grass. In some cases, a single bento box may incorporate up to 6 distinct packaging elements. Sushi dishes typically have 1 to 2 packaging components, while onigiris may have just one outer layer of packaging. However, packaging varies between products within one category.

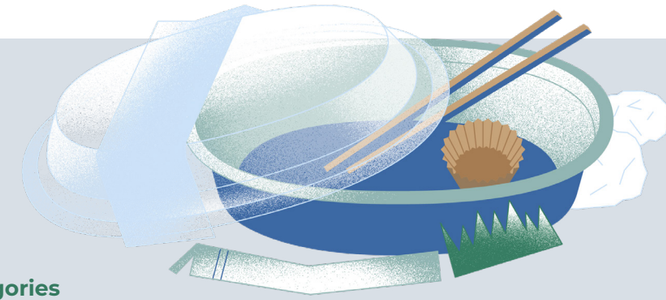
A description of the separate packaging components as well as a breakdown of the average number of packaging components for each product category is provided in Tables 11 and 12 in the Appendix.

The cumulative effect of these packaging practices is substantial. The 491 million bento boxes sold by Seven-Eleven alone resulted in the use and disposal of 1.9 billion individual pieces of single-use packaging.

When extrapolated to encompass the sushi dishes, bento boxes, and onigiris across the three chains, the total number of separate pieces of **single-use packaging amounts to** an overwhelming **8.2 billion** (Table 5).

Table 5: Shows the total number of products sold in millions (M), the corresponding total number of single-use packaging components in millions (M), and the total amount of single-use packaging in metric tons (Mt) for onigiri, bento box, and sushi dish categories across Seven-Eleven, FamilyMart, and Lawson convenience stores in fiscal year 2023. Values may not sum precisely due to rounding; values have been rounded down to the nearest whole number.

Name of the chain	Product Category	Total number of products sold (M)	Corresponding total number of single-use packaging components (M)	Total amount of single-use packaging (M)
Seven-Eleven	Onigiris	1,643.8	1,972.5	3,503.8
	Bento boxes	491.0	1,900.4	16,621.4
	Sushi dishes	248.1	396.9	854.8
FamilyMart	Onigiris	1,167.6	1,284.4	4,866.2
	Bento boxes	157.4	645.4	2,522.1
	Sushi dishes	223.0	624.4	1,448.2
Lawson	Onigiris	650.8	780.9	2,612.3
	Bento boxes	163.2	587.8	3,161.5
	Sushi dishes	40.2	64.3	233.2
Sum		4,785.4	8,257.6	35,823.4



METHODOLOGY

RESEARCH SCOPE

Selected Chains and Product Categories

This study selected three convenience store chains based on their market dominance. The names of these chains and their corresponding market shares for fiscal year 2023 were openly sourced and are listed in Table 6. We focused on four product categories: bento boxes, sushi dishes, onigiris, and over-the-counter beverages. The products in each category were drawn from those listed on the convenience store chains' websites. Category names and the corresponding number of products are listed in Table 7. The websites were accessed on July 8th and 9th, 2024. It is important to note that changes to the product offerings may have occurred since then. The analysis is based on several key assumptions, so Greenpeace Japan contacted all six chains (three convenience store chains and three café chains) to seek their views on the survey results and, if possible, to request their own usage estimates. All companies responded, but as of the report's publication, five companies did not provide supporting information, instead responding that such data is "not disclosed" or that they "cannot disclose sales-related data." Regarding the three convenience store chains, FamilyMart responded that "although there is a discrepancy with the actual figures, we have consistently chosen not to disclose this information," while Lawson stated that "the estimated figures differ from our own."

Name of the chain	Market share in FY 2023 (%)	Total share for FY 2023 (in trillion yen)
Seven-Eleven	45.8	5.36
FamilyMart	26.2	3.07
Lawson	20.6	2.42

Table 6: The three major convenience store chains investigated in this study, along with their respective market shares (%) according to total sales in fiscal year 2023 and their reported total net sales (in trillion yen) for fiscal year 2023.[46]

Table 7: The category names used in this report, along with their corresponding original product category names in Japanese as listed on the chains' websites. The total number of products within each category and the number of products purchased and weighed for the weight estimation. Product information from the websites was collected on July 8th and 9th, 2024.

Category name	Name of the chain	Original category name	Number of products in category	Number of products purchased and weighed
Onigiris	Seven-Eleven	おにぎり	178	10
	FamilyMart	おむすび	28	4
	Lawson	おにぎり	30	4
Bento boxes	Seven-Eleven	お弁当	183	10
	FamilyMart	お弁当	28	4
	Lawson	お弁当, チルドお弁当	21	4
Sushi dishes	Seven-Eleven	お寿司	57	6
	FamilyMart	お寿司	21	3
	Lawson	お寿司	8	3
Beverages	Seven-Eleven	セブンカフェ	10	4*
	FamilyMart	コーヒー・フラッペ (FAMIMA CAFÉ)	21	4*
	Lawson	コーヒー (Machi Cafe)	20	4*

* A total of four cups were purchased to account for the use of both paper and plastic cups within the coffee category. Specifically, two paper cups and two plastic cups of comparable sizes were selected.

Timeframe

This study examined the amount of single-use packaging waste emitted by the Japanese convenience store sector in fiscal year 2023.

Date Sources

The data were obtained from multiple sources. The FY 2023 net sales data were derived from documents and annual reports published by the three chains themselves, while customer consumption patterns were analysed from receipt data provided by WED 株式会社. A minimum of 1400 randomly selected receipt entries for each chain in fiscal year 2023 were analysed for a confidence level of at least 99% and a maximum 3% margin of error.

DATA ANALYSIS

It was assumed that the receipts reflect general consumer behaviour. Identifiable products from the receipt data were grouped into five categories: onigiris, bento boxes, sushi dishes, beverages, and others. The categorisation was conducted using a two-step analysis: keyword detection and manual sorting. Keywords were identified based on the naming conventions used by the chains themselves. When a product name contained one of these predefined keywords, it was assigned to a specific category accordingly, using R language as a tool. Approximately one-third of the products were identified in this manner. The remaining products were identified and categorised using manual sorting.

CALCULATION FLOW

The value ratio of net sales for each product category relative to the total net sales from all receipts was calculated. This ratio was then applied to each chain's overall annual net sales. By dividing the resultant total value by the average unit price of each respective product category (calculated from the receipt data), the number of items per category was determined.

Net Sales per Chain

Seven-Eleven

Seven-Eleven's fiscal year 2023 net sales were published in its annual *Corporate Outline* report[45]. The document listed key subsidiaries in the domestic convenience store business, including Seven-Eleven Japan Co., Ltd. and Seven-Eleven Okinawa Co., Ltd., whose combined sales figures contributed to the total net sales of the domestic convenience store business and were added together for the purpose of this report.

FamilyMart

Based on the financial statements of FamilyMart, it was inferred that the standalone net sales did not include the sales from stores operated by Okinawa FamilyMart Co., Ltd., Minami Kyushu FamilyMart Co., Ltd., or JR Kyushu Retail.[49] The net sales for Minami Kyushu FamilyMart Co., Ltd. for the fiscal year 2023 were publicly available and added to the net sales.[50] The net sales figures for Okinawa FamilyMart Co., Ltd. and JR Kyushu Retail were not publicly disclosed and had to be estimated. To estimate these figures, the standalone net sales of FamilyMart were divided by the total number of FamilyMart stores to determine the approximate average net sales per store. This average was then multiplied by the number of stores operated by both companies and added to the overall standalone net sales.

Lawson

Based on the financial statements of Lawson Inc., it was inferred that the non-consolidated operating results primarily reflected the net sales of Lawson, Natural Lawson, and Lawson Store 100 for the fiscal year 2023.[51,52] To isolate the net sales for Lawson stores specifically, the net sales for Lawson Store 100 and Natural Lawson were subtracted from those of the non-consolidated operating results. The net sales for Lawson Store 100 were publicly available, while net sales for Natural Lawson were not disclosed and, therefore, estimated. The approximate average net sales per store was calculated by dividing the combined net sales of Lawson and Natural Lawson by the total number of Lawson and Natural Lawson stores. This average was then multiplied by the number of Natural Lawson stores to estimate their approximate net sales and subtracted from the non-consolidated operating results.

Additionally, Lawson stores in Okinawa (Lawson Okinawa, Inc.), Kagoshima (Lawson Minamikyushu, Inc.), and Kochi (Lawson Kochi, Inc.) operate as independent entities but are major subsidiaries of Lawson Inc., meaning their net sales were not included in the parent company's net sales. The net sales for Lawson Minamikyushu, Inc. were publicly available and were added to the net sales for Lawson stores calculated in the previous step.[52] For Lawson Okinawa, Inc. and Lawson Kochi, Inc., where net sales figures were not disclosed, estimates were made using the average net sales per Lawson store as a reference. This average was multiplied by the total number of stores in Okinawa and Kochi to approximate their respective net sales.

Packaging Componets

Under the assumption that each product may come with more than one single-use item attached or wrapped around it, an additional analytical step to estimate the average number of single-use packaging components was conducted. A list of separate packaging components commonly used in convenience store products can be found in the Appendix (Table 11). First, a list of all products within the four categories from each chain was collected on July 8th and 9th, 2024. A combination of Google searches and website information was used to ascertain the types and quantities of single-use packaging components for each product. For products where single-use packaging components could not be identified via desktop research, products were purchased. For products sold exclusively outside the Tokyo metropolitan area, the purchase of the products for verification was not feasible. The total number of products for each category was then converted into weight equivalents for better comparability. The average weights for each category were calculated by purchasing and weighing at least 10% of randomly selected products from the total number in that category. For the onigiri and bento box categories at Seven-Eleven, where the number of product items was substantial, a sample size of 10 products was used, representing 5.6% and 5.5% of the total, respectively. The sampling was limited to products available within Tokyo. Given that the number of products and their packaging can change throughout the year, it is important to note that the average number of single-use items per category as well as the corresponding average weight equivalents may vary.

cherrydonut/Shutterstock

CHAPTER 4

ESTIMATING POTENTIAL

ENVIRONMENTAL SAVINGS

The previous two chapters highlighted the significant consumption of single-use packaging for food and beverages within the café and convenience store sectors, underscoring the urgent need for these industries to reform their business models and move away from the throwaway culture they are perpetuating. Given the scale of this issue, superficial measures are insufficient; a fundamental transformation in corporate practices and government policies is imperative. While potential solutions are manifold, one promising approach is the adoption of reuse schemes across sectors. Takeaway beverages, in particular, are almost exclusively sold in single-use cups, representing a significant area of improvement through the broader implementation of rental reuse systems. Greenpeace East Asia's 2023 report, *Reusable is Futurable*, demonstrated the environmental benefits of rental reuse cups over their disposable counterparts, highlighting positive impacts on ecosystems, human health, and resource conservation. The report emphasised that increasing the number of uses per reusable cup during its lifespan is crucial for maximising environmental savings and advocated for expanding reuse systems at a societal level to achieve greater cumulative benefits.

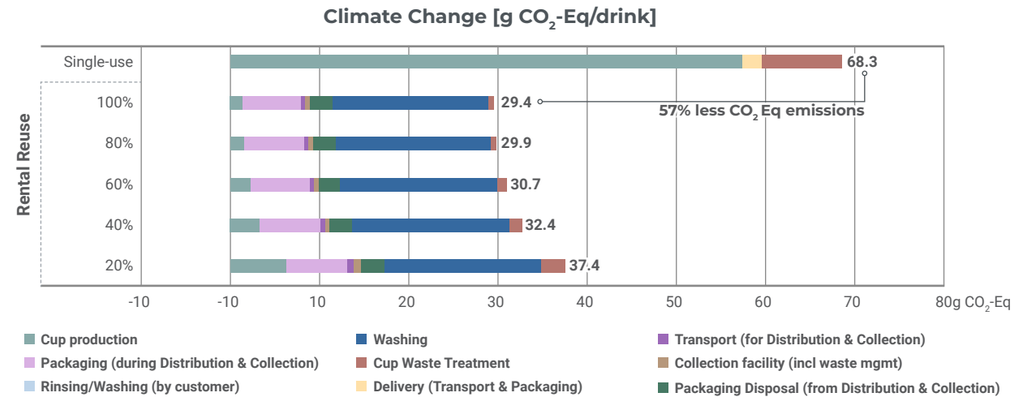
In this chapter, Greenpeace Japan collaborated with Dr. Meike Sauerwein to compare the environmental performance of rental reuse cups with single-use cups specifically for takeaway consumption. This analysis builds on the previous LCA model developed for the *Reusable is Futurable* report. Key parameters were aligned with the Japanese context to explore how a large-scale reuse system could function for sectors like convenience stores and café chains, where widespread adoption would be essential for meaningful impact. This model simulates scenarios where 20%, 40%, 60%, 80% and 100% of daily takeaway drinks were served in reusable cups. The overall daily takeaway beverage sales are based on the actual numbers of the six chains in 2023 calculated in the previous two chapters. Additionally, transportation logistics were updated to reflect local conditions, replacing motorbikes with trucks, more widely used in Japan. Further details can be found in the methodology section.

The results are shown as the impacts per one beverage served, either in a single-use cup or a rental reusable cup. For single-use cups (assuming a 50/50 mix of paper and PET cups), the majority of emissions stem from the production of the cup, followed by disposal (via landfill and incineration) and the packaging used for delivery. Greenhouse gas (GHG) emissions from the end-of-life phase are primarily associated with incineration.

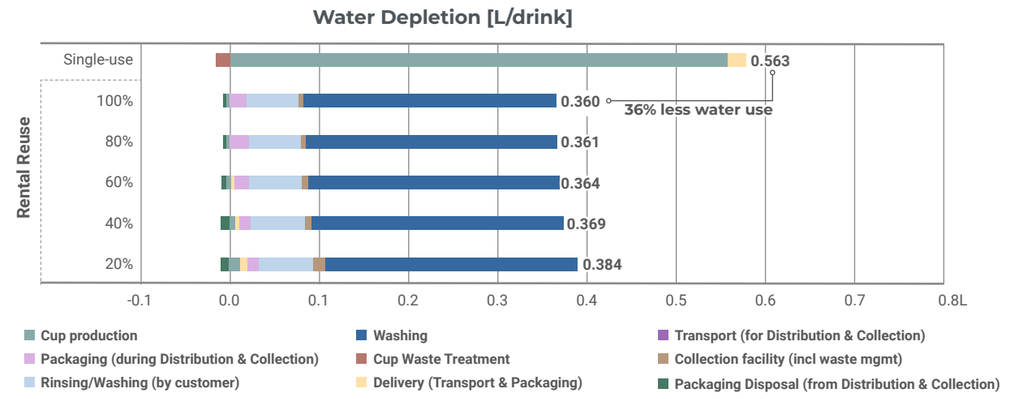
While reusable cups show better overall environmental performance, washing remains a significant impact factor. Additional environmental impacts arise from the disposable packaging and reusable polypropylene (PP) boxes used during cup distribution and collection. The reuse system involves over-the-counter distribution, with dirty cups collected in LDPE plastic bags. These bags are reused once for distribution and collection but ultimately discarded due to contamination risks. The production of reusable cups has a relatively low environmental impact, as each cup is used multiple times over three years.

Regarding key environmental categories—climate change, water use, and fossil fuel depletion—the reuse system outperforms single-use cups, even when reusable cups are used less frequently over their three-year lifespan. For example, when only 20% of takeaway drinks are served in reusable cups, each reusable cup is used 58 times over three years. In contrast, if 80% of the takeaway drinks are served in reusable cups, each cup is used 234 times, approaching its total technical lifespan of 300 uses. As the number of reuses per cup increases, the environmental impacts associated with production and disposal decrease even further. Recurring processes such as washing and packaging have a constant impact across all reuse cycles. In this model, with 20% of daily takeaway beverages served in reusable cups, the environmental impacts amount to 37.4 g CO_2-Eq., 0.384 litres of water, and 13.5 g oil-Eq. per drink. An increase to 40% would reduce greenhouse gas emissions by 13%, water use by 4%, and fossil fuel depletion by 16%. Further increases of daily takeaway beverages served in reusable cups to 60%, 80%, or even 100% would yield additional reductions, with full adoption (100%) leading to **57% less CO2-Eq. emissions, 36% less water use, and 62% less fossil fuel depletion compared to single-use cups** (Graphs 3-5).

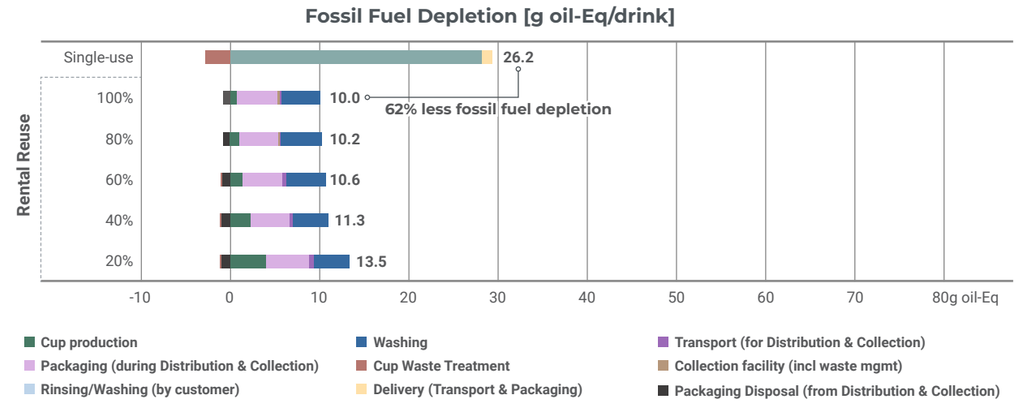
In fact, with just eight uses, the environmental impact of a reusable cup equals that of a disposable cup in terms of water usage. For fossil fuel depletion, the breakeven point is nine uses, and for climate change impact, it's 14 uses. Beyond these breakeven points, each additional use of a reusable cup saves more water, reduces CO_2-equivalent emissions, and conserves fossil fuels.



Graph 3: Climate Impacts (in gram CO_2-Eq./drink) of single-use cups (a 50/50 mix of PE-lined paper and PET cups) compared to reusable cups. For the rental reuse, five scenarios are presented, showing the climate impacts when 20%, 40%, 60%, 80%, or 100% of the 200 daily takeaway drinks are served in reusable cups.



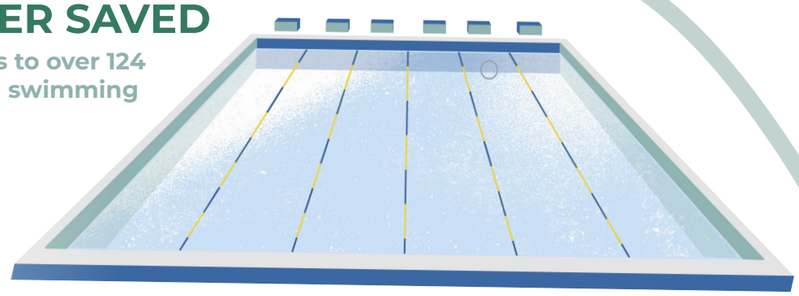
Graph 4: Water use (in Litre) of single-use cups (a 50/50 mix of PE-lined paper and PET cups) compared to reusable cups. For the rental reuse, five scenarios are presented, showing the water use when 20%, 40%, 60%, 80%, or 100% of the 200 daily takeaway drinks are served in reusable cups.



Graph 5: Fossil fuel depletion (in gram oil-Eq.) of single-use cups (a 50/50 mix of PE-lined paper and PET cups) compared to reusable cups. For the rental reuse, five scenarios are presented, showing the Fossil fuel depletion when 20%, 40%, 60%, 80%, or 100% of the 200 daily takeaway drinks are served in reusable cups.

OVER 465,000 M³ OF WATER SAVED

which equates to over 124 Olympic-sized swimming pools.



OVER 88 MILLION KG OF CO_2-EQ.,

which equates to over 64,000 cars being taken off the streets of Japan for one whole year, or the amount of CO_2 that is absorbed by 4 million mature trees in a year.

OVER 37 MILLION KG OF OIL-EQ.,

which equates to over 271,000 barrels of oil.

Building on these insights, we calculated and visualised the potential total environmental savings realised if the six café and convenience store chains investigated in this study implemented a rental reuse scheme for their takeaway services. In 2023, the six chains collectively sold more than 2.2 billion takeaway beverages in single-use cups. If this number of drinks were instead served 100% in reusable cups, the environmental savings would be substantial:

As reuse systems are operated on a larger scale and more consumers adopt them; the cumulative environmental benefits will increase, showcasing the transformative potential of this approach. However, achieving these benefits on a larger scale will require overcoming several logistical challenges, such as optimising washing and transportation processes to minimise emissions and energy consumption. Furthermore, the successful expansion of reuse systems will depend on cross-sector collaboration to establish reuse as the new norm in cafés, convenience stores, and the broader food and beverage sector.

METHODOLOGY

The modelled system in this report does not represent a single business model but integrates elements from five reusable cup rental service providers in Busan, Hong Kong, Taipei and Tokyo, who supplied primary data on their operations. Japan-specific data is prioritised wherever possible. The LCA measures and compares the environmental impacts of rental reusable cups versus single-use cups. Detailed changes in the research scope are provided below. For a comprehensive understanding of the entire methodology, please refer to the *Reusable is Futurable* report report from 2023.

IMPACT CATEGORIES

Impact categories are critical areas of environmental concern used to quantify the potential impacts of reusable and disposable cups throughout their lifecycle, from production to final disposal. Each category addresses a specific environmental burden during the product's life—from raw material extraction to production, use, and disposal. Sixteen impact categories are analysed, with three particularly relevant categories further highlighted in this report: **Climate Change**, which assesses the contribution to global warming from greenhouse gas emissions, expressed in CO_2 equivalents; **Water Depletion**, which assesses the use and depletion of freshwater resources, impacting availability for ecosystems and human use and **Fossil Fuel Depletion**, which assesses the depletion of non-renewable energy sources, such as oil, coal, and natural gas.

Table 8: Summary of system settings for the rental reuse system.

Variable	Scenario value				
Stores in the system	40 stores				
Total number of cups purchased	30,000 cups				
Annual loss rate	5%				
Cup volume	473 mL				
Cup & lid material	Polypropylene				
Cup + lid weight	85 g + 15 g				
Total lifetime of cups until all cups get disposed of and replaced by new ones	3 years				
Technical lifespan of cups	up to 300 uses				
Takeaway drinks per store per day	200*				
% of drinks in reusable containers	20%	40%	60%	80%	100%
Delivery frequency per store per week **	2x	2x	min 3x	min 4x	min 5x
Number of drinks served in reusable cups per week in all 40 stores	11,200	22,400	33,600	44,800	56,000
Clean cups available in all 40 stores	25,721	25,721	38,582	51,443	64,303
Reuse per cup over 3 years	58	117	175	234	292
Total number of drinks served with reusable cups in 3 years	1,752,000	3,504,000	5,256,000	7,008,000	8,760,000

*Calculated from the average of takeaway sales for convenience stores and café chains investigated in this study (see chapter 2 and 3)

**The here set system aims to serve 20%, 40%, 60%, 80%, and 100% of the daily sold 200 takeaway drinks in reusable cups. Therefore, the delivery frequency is set to ensure sufficient cup availability in stores.

RESEARCH SCOPE

A reuse service provider manages all aspects of reverse logistics, including the acquisition, collection, washing, and final disposal of reusable cups. Both distribution to customers and the collection of used cups occur directly over the counter at the stores. The reuse system involves 40 participating stores. Whereby each store sells an average of 200 takeaway beverages daily, based on data from all six chains calculated in Chapters 2 and 3. To facilitate 20%, 40%, 60%, 80%, and 100% of daily takeaway drinks to be served in reusable cups, the system requires a total of 30,000 reusable cups.

Due to the high density of convenience stores and café chains, it is assumed that customers can return the cups within walking distance and do not require additional transportation. Based on estimates from service providers, approximately 10% of users are expected to rinse the reusable cups before returning them. Disposable cups are used once and discarded, while reusable cups are assumed to have a lifespan of three years, regardless of the number of uses. After three years, all reusable cups are decommissioned and disposed of following typical waste disposal pathways (as detailed in Table 10).

The functional unit is one beverage served in a single-use or a reusable cup (from a rental reuse service provider). The reusable cup is assumed to be made of polypropylene (PP), while the disposable cup consists of a 50/50 mix of polyethene-lined (PE-lined) paper cups and polyethene terephthalate (PET) cups.

Table 9: Summary of system settings for the single-use system.

Variable	Value	
	Single-use PET	Single-use PE-lined paper cup
Cup volume	473 mL	473 mL
Cup + lid weight	15.6 g + 3.5 g	13.5 g + 3.5 g
Technical lifespan of cups	Once, before tossed away.	Once, before tossed away.

Table 10: LCA inputs for waste treatment in single-use and rental reuse systems - Waste Treatment. (Incineration processes including Waste-to-Energy technology). A cut-off method has been used for waste streams in both reuse and single-use systems that go to recycling or downcycling. This means the impact assessment considered waste collection (transport) but did not include additional recycling processes or credits for secondary raw materials.

Waste type	Waste treatment methodology
non-recoverable waste (e.g., Paper cups, contaminated PE bags)	80% Incineration, 1% Landfill, 19% Downcycling (Cut-off)[53]
PE, PET and PP	69.2% Incineration, 5.6% Landfill, 25.2% Downcycling (Cut-off)[18]
Cardboard (e.g., delivery boxes)	16.8% Incineration, 2.1% Landfill, 81.1% Downcycling (Cut-off)[54]

CHAPTER 5

CONCLUSION
AND RECOMMENDATIONS

In conclusion, despite the growing evidence of the negative impacts of single-use packaging, major players in the food and beverage industry, including the six chains investigated in this study, have yet to fully disclose or take responsibility for the substantial amount of waste they generate annually. The figures presented in this report are alarming and underscore the urgent need for fundamental change across both sectors. To address this issue effectively, businesses must recognise their corporate responsibility and pursue comprehensive, sustainable changes. Shifting away from single-use packaging is crucial, with a focus on reduction and the implementation of reuse and refill schemes. Initiatives such as reusable options for dine-in services, offering products without packaging, and setting up in-store refill stations for beverages and dry goods are essential for making significant progress in waste reduction. Additionally, developing inter-sectoral rental-reuse schemes for takeaway customers in cafés and convenience stores is important to ensure ease of use for consumers.

With their existing infrastructure, major chains are ideally positioned to lead this transition. By adopting a combination of these strategies, they can substantially reduce single-use packaging waste and promote more responsible consumption practices.

Professor
TOMOHIRO TASAKI

Head of Material Cycles and Social Systems Research Section, National Institute for Environmental Studies

The issue of plastic, which is being addressed globally, is deeply embedded in our daily lives and business practices. Addressing it effectively requires more than corporate (supply-side) efforts; consumer (demand-side) actions are also essential. For both sides, findings like these should prompt us to reflect on and reconsider the mass-consumption society we have grown so accustomed to.

Professor
HARADA SADAO

Associate Professor, Faculty of Economics, Doshisha University

Paper cups and similar products used for takeaway beverages at rapidly expanding convenience stores are inherently difficult to recycle. This study is significant as it reveals the reality of single-use cups for the first time. We hope that the efforts of various companies will lead to improvements in the future.

GREENPEACE JAPAN
RECOMMENDATIONS

01

Both sectors need to enhance transparency about the amount of single-use packaging waste produced throughout the entire supply chain. This disclosure is crucial for empowering consumers to make informed decisions about their consumption behaviours and to foster collaboration between companies, governments, and other stakeholders to develop collective strategies for reducing waste.

02

Both sectors need to set ambitious targets to reduce the overall amount of single-use packaging and be transparent about their progress towards achieving these goals.

03

Both sectors need to set ambitious targets for adopting reuse-and-refill systems that aim to significantly reduce the environmental impacts associated with single-use packaging and promote the transition to reusable alternatives.

04

Both sectors should explore the potential for inter-sectoral reuse schemes. By fostering collaboration between convenience store chains, café chains, and other stakeholders, the industry can introduce and promote large-scale reuse initiatives that make it easier for consumers to engage in and adopt sustainable practices.

REFERENCES

1. The Pew Charitable Trusts and Systemiq. 2020. “Breaking the Plastic Wave: A Comprehensive Assessment of Pathways Towards Stopping Ocean Plastic Pollution.” https://www.pewtrusts.org/-/media/assets/2020/07/breakingtheplasticwave_report.pdf
2. Duncan, Emily M., Zara L. R. Botterell, Annette C. Broderick, Tamara S. Galloway, Penelope K. Lindeque, Ana Nuno, and Brendan J. Godley. 2017. “A global review of marine turtle entanglement in anthropogenic debris: A baseline for further action.” Endangered Species Research 34:431–448. DOI:10.3354/esr00865
3. Kahane-Rappor, S. R., M. F. Czapanskiy, J. A. Fahlbusch, A. S. Friedlaender, J. Calambokidis, E. L. Hazen, J. A. Goldbogen, and M. S. Savoca. 2022. “Field measurements reveal exposure risk to microplastic ingestion by filter-feeding megafauna.” Nature Communications 13. DOI:10.1038/s41467-022-33334-5
4. Wang, Yize, Hiroshi Okochi, Yuto Tani, Hiroshi Hayami, Yukiya Minami, Naoya Katsumi, Masaki Takeuchi, Atsuyuki Sorimachi, Yusuke Fujii, Mizuo Kajino, Kouji Adachi, Yasuhiro Ishihara, Yoko Iwamoto, and Yasuhiro Niida. 2023. “Airborne hydrophilic microplastics in cloud water at high altitudes and their role in cloud formation.” Environmental Chemistry Letters 21:3055–3062. DOI:10.1007/s10311-023-01626-x
5. Arakawa, Hisayuki, Haruka Nakano, and Keiichi Uchida. 2023. “Plastic contamination in coastal areas around Japan: A review.” La mer 61 (3-4): 165-173. DOI:10.32211/lamer.61.3-4_165
6. Ushijima, Taishi, Shuhei Tanaka, Yuji Suzuki, Satoru Yukioka, Mengze Wang, Yoshiki Nabetani, Shigeo Fujii, and Hideshige Takada. 2018. “Occurrence of Microplastics in Digestive Tracts of Fish with Dierent Modes of Ingestion in Japanese Bays and Lake Biwa.” Journal of Japan Society on Water Environment 41 (4): 107-113. DOI:10.2965/jswe.41.107
7. Center for International Environmental Law (CIEL). 2017. “Fueling Plastics: Fossils, Plastics, & Petrochemical Feedstocks.” https://www.ciel.org/wp-content/uploads/2017/09/Fueling-Plastics-Fossils-Plastics-Petrochemical-Feedstocks.pdf
8. Center for International Environmental Law (CIEL). 2019. “Plastic & Health: The Hidden Costs of a Plastic Planet.” https://www.ciel.org/wp-content/uploads/2019/02/Plastic-and-Health-The-Hidden-Costs-of-a-Plastic-Planet-February-2019.pdf
9. Hays, Jake, and Seth B. Shonkoff. 2016. “Toward an Understanding of the Environmental and Public Health Impacts of Unconventional Natural Gas Development: A Categorical Assessment of the Peer-Reviewed Scientific Literature, 2009-2015.” PLoS ONE 11 (4). DOI:10.1371/journal.pone.0154164
10. Clean Air Task Force. 2016. “Gasping for Breath: An analysis of the health effects from ozone pollution from the oil and gas industry.” https://www.catf.us/wp-content/uploads/2018/10/CATF_Pub_GaspingForBreath.pdf
11. National Center for Environmental Health (NCEH). 2018. “Emergency Preparedness and Response: Facts About Benzene.” Accessed August 26, 2024. https://emergency.cdc.gov/agent/benzene/basics/facts.asp
12. U.S. Environmental Protection Agency. 2000. “Styrene.” https://www.epa.gov/sites/default/files/2020-05/documents/styrene_update_2a.pdf
13. U.S. Environmental Protection Agency. 2012. “Toluene.” https://www.epa.gov/sites/default/files/2016-09/documents/toluene.pdf
14. U.S. Environmental Protection Agency. 2015. “2011 National Air Toxics Assessment.” https://www.epa.gov/national-air-toxics-assessment/2011-nata-assessment-results#modeled
15. National Association for the Advancement of Colored People, and Clean Air Task Force. 2017. “Fumes Across the Fence-Line: The Health Impacts of Air Pollution from Oil & Gas Facilities on African American Communities.” https://www.catf.us/wp-content/uploads/2017/11/CATF_Pub_FumesAcrossTheFenceLine.pdf
16. Jephcote, Calvin, David Brown, Thomas Verbeek, and Alice Mah. 2020. A systematic review and meta-analysis of haematological malignancies in residents living near petrochemical facilities. Environmental Health 19, 53. DOI:10.1186/s12940-020-00582-1
17. Geyer, R. 2020. “Production, use, and fate of synthetic polymers.” Plastic Waste and Recycling. DOI:10.1016/B978-0-12-817880-5.00002-5
18. 一般社団法人 プラスチック循環利用協会 (2024年)「プラスチックリサイクルの基礎知識2024」 https://www.pwmi.or.jp/pdf/panf1.pdf
19. 一般社団法人 プラスチック循環利用協会 (2023年)「プラスチック製品の生産・廃棄・再資源化・処理処分の状況」 https://www.pwmi.or.jp/pdf/panf2.pdf
20. OECD. 2024. “Global Export Data. 2023 Annual Summary.” Accessed August 26, 2024. https://www.ban.org/plastic-waste-project-hub/trade-data/global-export-data-annual-summary.
21. GAIA. 2019. “Discarded: Communities on the Frontlines of the Global Plastic Crisis.” https://www.no-burn.org/resources/discarded-communities-on-the-frontlines-of-the-global-plastic-crisis/.
22. The Center to Combat Corruption and Cronyism (C4 Center). 2024. “Ending Waste Colonialism, Governing Plastic Pollution: Japan’s Opportunity to Lead Asia out of the Plastic Crisis.” https://c4center.org/wp-content/uploads/End-Waste-Colonialism-Governing-Plastic-Pollution-Final.pdf
23. Jambeck, Jenna R., Roland Geyer, Chris Wilcox, Theodore R. Siegler, Miriam Perryman, Anthony Andrady, Ramani Narayan, and Kara Lavender Law. 2015. “Plastic waste inputs from land into the ocean.” Science 347 (6223): 768-771. DOI:10.1126/science.1260352
24. World Economic Forum, Ellen MacArthur Foundation, and McKinsey & Company. 2016. “The New Plastics Economy — Rethinking the future of plastics.” http://www.ellenmacarthurfoundation.org/publications
25. Ferreira-Filipe Diego A., Ana Paço, Armando C. Duarte, Teresa Rocha-Santos, and Ana L. Patrício Silva. 2021. “Are Biobased Plastics Green Alternatives?—A Critical Review.” International Journal of Environmental Research and Public Health 18 (15): 7729. DOI:10.3390/ijerph18157729
26. Bowyer, Jim, Kathryn Fernholz, Matt Frank, Jeff Howe, Steve Bratkovich, and Ed Pepke. 2014. “Bamboo Products And Their Environmental Impacts: Revisited.” https://dovetailinc.org/report_pdfs/2014/dovetailbamboo0314.pdf

REFERENCES

27. Paul-Pont, Ika, Jean-François Ghiglione, Emmanuelle Gastaldi, Alexandra Ter Halle, Arnaud Huvet, Stéphane Bruzaud, Fabienne Lagarde, François Galgani, Guillaume Duflos, Matthieu George, and Pascale Fabre. 2023. “Discussion about suitable applications for biodegradable plastics regarding their sources, uses and end of life.” Waste Management 157. DOI:10.1016/j.wasman.2022.12.022
28. Republic of Rwanda. 2019. Law No.17/2019 Of 10/08/2019 relating to the prohibition of manufacturing, importation, use and sale of plastic carry bags and single-use plastic items.
29. European Parliament. 2024. “New EU rules to reduce, reuse and recycle packaging.” European Parliament. Accessed August 19, 2024. https://www.europarl.europa.eu/news/en/press-room/20240419IPR20589/new-eu-rules-to-reduce-reuse-and-recycle-packaging.
30. Légifrance. 2020. “LOI n° 2020-105 du 10 février 2020 relative à la lutte contre le gaspillage et à l'économie circulaire (1)”. Accessed August 28, 2024. https://www.legifrance.gouv.fr/jorf/id/JORFTEXT000041553759/
31. Ministère de la Transition Écologique et Solidaire. 2020. “The Anti-Waste Law in the Daily Lives of the French People, What Does That Mean in Practice?” Ministère de la Transition Écologique et Solidaire; Paris, France. https://circulareconomy.europa.eu/platform/sites/default/files/anti-waste_law_in_the_daily_lives_of_french_people.pdf
32. Ellen MacArthur Foundation. 2019. “Reuse – rethinking packaging.” https://emf.thirdlight.com/file/24/_A-BkCs_aXeX02_Am1z_J7vzLt/Reuse%20%E2%80%93%20rethinking%20packaging.pdf
33. Gallego-Schmid, Alejandro, Joan Manuel F. Mendoza, and Adisa Azapagic. 2019. “Environmental impacts of takeaway food containers.” Journal of Cleaner Production 211:417-427. DOI:10.1016/j.jclepro.2018.11.220
34. Bradley, Charles G., and Lucia Corsini. 2023. “A literature review and analytical framework of the sustainability of reusable packaging.” Sustainable Production and Consumption 37:126-141. DOI:10.1016/j.spc.2023.02.009
35. Spycher, Nils F. 2022. “Estimating food delivery customers’ willingness to pay for convenience to accelerate the usage of reusable packaging.” https://occrdata.unibe.ch/students/theses/msc/384.pdf
36. Eunomia. 2023. “Assessing Climate Impact: Reusable Systems vs. Single-use Takeaway Packaging.” https://circulareconomy.europa.eu/platform/sites/default/files/2023-09/Assessing-the-Climate-Impact-Reusable-systems-vs.-Single-Use-Takeaway-Packaging-v-2.2.pdf
37. Greenpeace East Asia. 2023. “Reusable is Futurable - A Comparative Life-Cycle Assessment on the Environmental Performance of Reuse and Disposable Cup Systems in East Asia”. https://www.greenpeace.org/static/planet4-taiwan-stateless/2023/11/ea4cf8f1-greenpeace_reusable-is-futurable_full-report.pdf
38. 環境省 (n.d.)「特定プラスチック使用製品の使用の合理化」Accessed August 22, 2024. https://plastic-circulation.env.go.jp/about/shohisha/gorika
39. Greenpeace Japan. 2022. “Disposable cups in the Japanese Café Industry.” https://www.greenpeace.org/japan/wp/wp-content/uploads/2022/07/5226ce29-disposablecupsinjapanesecafeindustry_en.pdf
40. Euromonitor International. 2024. “Cafés/Bars in Japan - Category analysis.” https://www.euromonitor.com/cafes-bars-in-japan/report
41. グリーンピース・ジャパン (2023 年)「店内カップリユース率、スタバは大幅改善もタリーズは低水準ーー全国計150店舗のリユースの取り組み状況を調査」https://www.greenpeace.org/japan/press-release/press-release_64454/
42. 株式会社ローソン (2022年)「コーヒーカップの他業態とのリユース実験に参画」 Accessed August 26, 2024. https://www.lawson.co.jp/company/news/detail/1450110_2504.html
43. スターバックス コーヒー ジャパン 株式会社 (n.d.)「Re&Goの店舗一覧」 Accessed August 26, 2024. https://store.starbucks.co.jp/?reandgo=1
44. e-Stat. 2024. “Japan's Consumer Price Index in 2023.” Accessed August 29, 2024. https://www.e-stat.go.jp/en/stat-search/files?page=1&layout=datalist&toukei=00200573&tstat=000001150147&cycle=7&year=20230&month=0&tclass1=000001150150&tclass2val=0
45. 株式会社プロントコーポレーション (n.d.)「サステナビリティ推進」 Accessed August 26, 2024. https://www.pronto.co.jp/company/sustainability/
46. 株式会社セブン&アイ・ホールディングス (2024)「コーポレートアウトライン 2023年度版」https://www.7andi.com/ir/file/library/co/pdf/2024_all_b.pdf
47. 株式会社ファミリーマート (2024)「2024年2月期 営業概況 (単体) 」https://www.family.co.jp/content/dam/family/company/familymart/overview/240410_eigyogaikyo.pdf
48. 株式会社ローソン (2024)「店舗の状況」https://www.lawson.co.jp/company/ir/library/pdf/hosoku/hosoku_49_03.pdf
49. 株式会社ファミリーマート (2024)「2024年2月期 業績概況」https://www.family.co.jp/content/dam/family/company/familymart/overview/240410_gyosekigaikyo.pdf
50. 南九州ファミリーマート (2024)「企業情報 2024年度決算報告及び常勤役員人事変更のお知らせ」https://www.mfamily.co.jp/outline_cat/entry-6038.html
51. 株式会社ローソン (2024)「単体業績」 https://www.lawson.co.jp/company/ir/library/pdf/hosoku/hosoku_49_02.pdf
52. 株式会社ローソン (2024)「連結業績」https://www.lawson.co.jp/company/ir/library/pdf/hosoku/hosoku_49_01.pdf
53. 環境省「一般廃棄物の排出及び処理状況等 (令和２年度) について」2020年
54. 公益社団法人古紙再生促進センター「日本の紙リサイクル」2024年

APPENDIX

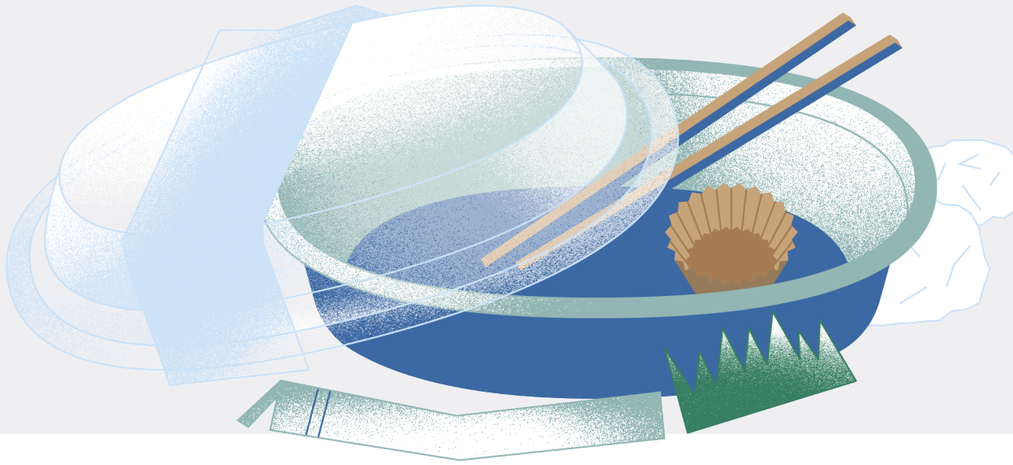
CHAPTER 3: SINGLE-USE PACKAGING IN CONVENIENCE STORES IN JAPAN

Table 11: List of separate single-use packaging components commonly used in convenience store products.

Single-use Packaging Component	Explanation
Container	The primary structure that encloses and holds the product and typically made of plastic or other materials.
Lid	A cover is used to seal the container.
Double-layer	An additional layer or compartment within the container, for separation of contents. It is usually made of more rigid plastic.
Thin wrapping film	A lightweight, flexible film used to wrap and protect the product. Generally for products that are not packaged inside a container (e.g. onigiri)
Film	A plastic film is used to seal the packaging. Generally wrapped around the container and lid.
Baran	A flat piece of plastic that divides different types of foods. It is also used for decorative purposes.
Side dish cup	A small cup that is used to hold side dishes or separate portions within the main container.
Inside small container	A smaller container with a lid that is placed inside the main container to hold sauces, condiments, or small side items.
Sachet	A small, sealed bag or packet containing a single serving of condiments or seasonings.
Inside sheet	A flat piece of film is used to cover or separate items within a package.

Table 12: Average number of single-use packaging components per product category. The number of separate single-use packaging components was identified for all products collected from the websites of the three chains (data from July 8th and 9th, 2024). Products for which the number of single-use packaging components could not be identified through online search were purchased and double-checked.

Name of the chain	Product category	The average number of single-use packaging components per product category
Seven-Eleven	Onigiris	**1.2**
	Bento boxes	**3.9**
	Sushi dishes	**1.6**
FamilyMart	Onigiris	**1.1**
	Bento boxes	**4.1**
	Sushi dishes	**2.8**
Lawson	Onigiris	**1.2**
	Bento boxes	**3.6**
	Sushi dishes	**1.6**




GREENPEACE