

Investigating Public Perception and Behavioral Response to Deposit-Refund System on Beverage Containers:

Insights from the Kowloon Dairy Glass Bottle Recycling Initiative

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Background



Hong Kong faces a severe waste management crisis, with 5.74 million tonnes of solid waste disposed of in landfills in 2022, yet only 32% was recycled (EPD, 2023). The Waste Blueprint for Hong Kong 2035 aims for a 55% recovery rate, necessitating innovative recycling strategies. Kowloon Dairy's Deposit and Refund System (DRS) for glass milk bottles, charging a HK\$1 deposit refundable at convenience stores, offers a potential solution. This study investigates public perception, behavioral responses, and the environmental impact of the DRS to inform Hong Kong's recycling policies.

Research Objectives



- 1.To evaluate the public perception of the Deposit and Refund System and identify the factors influencing the supportiveness.
- 2.To investigate the bottle returning behavior of customers towards the Deposit and Refund System, particularly the system of Kowloon Dairy glass bottles.
- 3.3.Provide suggestions for the design and recycling system of beverage packing in Hong Kong based on the carbon footprint.

Research Questions

- 1.What are the public's perceptions of the Deposit and Refund System for beverage containers in Hong Kong?
2. What are the key factors influencing the bottle returning behavior under the Deposit-Refund System, especially the system of Kowloon Dairy glass bottles?
- 3.What is the carbon footprint of the Kowloon Dairy milk products in glass bottles and Trappist Dairy milk products in paperboard cartons?

Methodology



A mixed-methods approach was used:

- 1.**Questionnaire:** 130 respondents assessed perceptions and behaviors toward the DRS.
- 2.**On-Site Visits:** Observations at nine convenience stores (7-Eleven, CircleK) across Hong Kong to study return behaviors.
- 3.**Carbon Footprint Analysis:** Compared Kowloon Dairy's glass bottles with paperboard cartons using life cycle assessment (LCA) data

Policy Recommendation

- **Enhance Awareness:** Use social media, bottle labels, and in-store stickers to inform the public about the DRS.
- **Increase Deposits:** Adjust to HK\$2–HK\$2.4, as suggested by 31.5% of respondents, to boost returns.
- **Expand Return Spots:** Prioritize retail stores over RVMs to improve convenience.
- **Extend DRS Scope:** Include plastic bottles and cans, with 95.9% and 85.6% willingness to return, respectively.



Conclusion

Kowloon Dairy's DRS shows promise with strong public support (74.07%), but its effectiveness is limited by low awareness and convenience issues. Financial incentives are key, particularly for lower-income groups, though glass bottles have a higher carbon footprint unless reused 16 times. Expanding the DRS and improving promotion can help Hong Kong achieve its Waste Blueprint 2035 goals, enhancing recycling rates and sustainability.

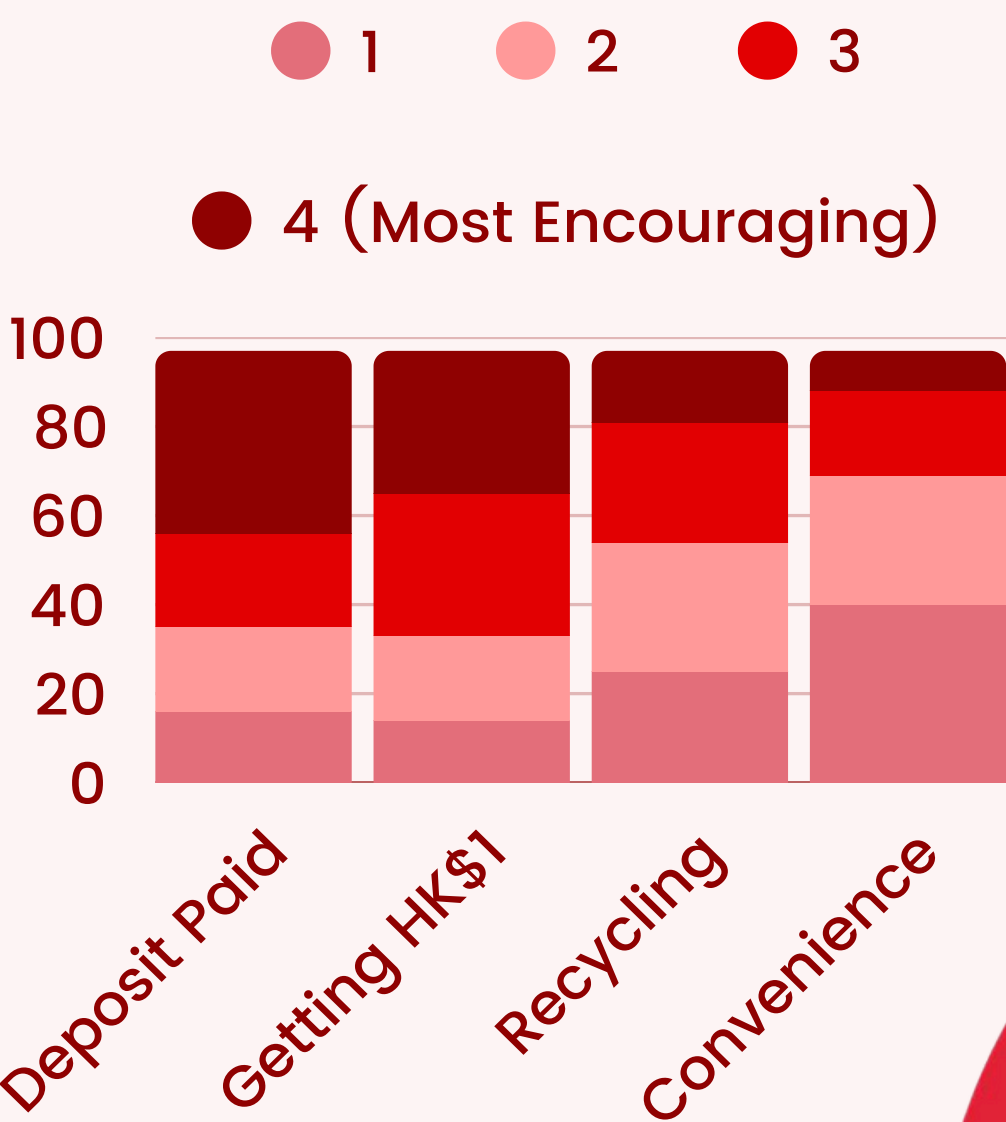
Key Findings

- **Public Perception:** **74.07%** support the DRS and 78.99% support "Polluter Pays" principle, but awareness is low—53% know of the HK\$1 deposit, and 81.5% find promotion insufficient.
- **Behavioral Factors:** **Financial incentives** (deposit: mean=2.89; refund: mean=2.84) drive returns, especially for lower-income groups ($p=0.061$). **Frequent Recyclers** tend to return the bottle due to environmental concern ($p=0.045$). Compare to younger, people **age 60+** are more motivated by the deposit factor. Convenience barriers like limited return spots (mean=2.56) deter participation.
- **Carbon Footprint:** Glass bottles (0.03452 kg CO₂e per use, 10 reuses) have a **higher** footprint than cartons (0.02456 kg CO₂e), but glass becomes more sustainable with **16 reuses**.



Factors encouraging bottle returning

Mean Value



Convenience Level =1.94
Recycling =2.34
Getting HK\$1 =2.84
Deposit Paid =2.89

