



Marketainer: Closed-Loop Packaging Solutions

An Eco-Entrepreneurial Venture

Rori Cowan, Hylton Edingfield, Kathryn Tannenbaum & Priya Vytla; Advisor: Roland Geyer



THROUGH INNOVATIVE TECHNOLOGY AND DESIGN, MARKETAINER WILL STREAMLINE THE BULK SHOPPING EXPERIENCE AND CATALYZE THE SUSTAINABLE PACKAGING REVOLUTION

BACKGROUND

Marketainer's objective is to profitably convert the current packaging supply chain into a closed-loop, sustainable system. This goal is based on the following assumptions:

- ▶ Conventional disposable packaging is resource-intensive
- ▶ Current supply chain operations are inefficient in many areas
- ▶ These factors give rise to substantial economic and environmental burdens
- ▶ There is demand for an efficient distribution system that delivers cost savings in addition to reducing the environmental impact

The goal of Marketainer is to phase out single-use packaging by creating a reusable distribution infrastructure. Marketainer aims to accomplish this by:

- ▶ Building upon the existing bulk distribution foundation
- ▶ Creating products that address the specific needs of manufacturers, retailers & consumers
- ▶ Optimizing the design of the Marketainer system through market research, a comprehensive life-cycle assessment, and an extensive economic analysis

The result is a highly efficient and professionally engineered system that the Marketainer team believes is the future of product packaging.

THE PROBLEM

Disposable packaging has a significant impact financially, not just for manufacturers, but during consumption and disposal as well.

- The food industry alone spends over \$50 billion per year on packaging¹
- Disposable packaging makes up an average of 15-35% of the direct cost that consumers pay for food products²
- U.S. taxpayers spend billions of dollars every year sending disposable packaging to landfills³

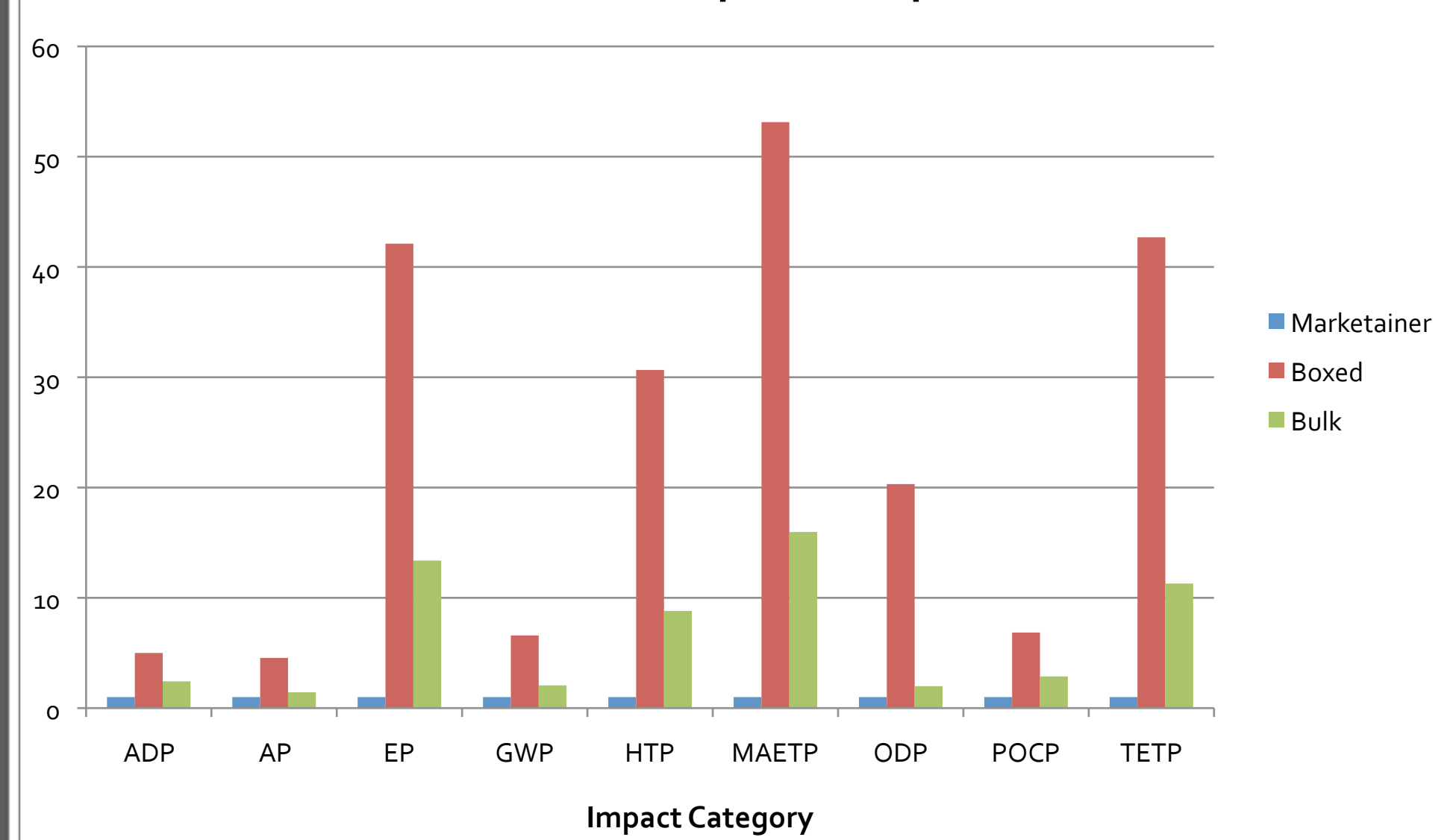
When calculating the full cost of the disposable packaging life cycle however, we must consider not just the economic, but also the environmental costs of its manufacture and disposal.

- The manufacture of disposable packaging relies on the extraction of raw materials such as nonrenewable fossil fuels – a significant contributor to global climate change
- Packaging makes up one-third of the municipal waste we send to our landfills³
- Excess waste and large landfills negatively impact local environmental quality⁴

There exists the potential for significant economic and environmental gains by developing a system that eliminates our dependence on disposable packaging.

LIFE-CYCLE ASSESSMENT

Environmental Impact Comparison



ENVIRONMENTAL IMPACT INDICATORS:

- ▶ ADP - Abiotic Depletion Potential
- ▶ AP - Acidification Potential
- ▶ EP - Eutrophication Potential
- ▶ GWP - Global Warming Potential
- ▶ HTP - Human Toxicity Potential
- ▶ MAETP - Marine Aquatic Ecotoxicity Potential
- ▶ ODP - Ozone Depletion Potential
- ▶ POCP - Photochemical Ozone Creation Potential
- ▶ TETP - Terrestrial Ecotoxicity Potential

A comparative life-cycle assessment (LCA) was performed to demonstrate the environmental benefits of the Marketainer system. The LCA evaluates conventional disposable packaging, the current bulk system and the Marketainer system. Golden Temple of Oregon's cereal was used as a baseline product, and its life-cycle impacts were tracked from its production to the final point of sale. The above graph illustrates the environmental impacts of the three systems in nine categories, normalized by Marketainer.

THE DOLLARS MAKE SENSE

	BOXED	BULK	MARKETAINER
PACKAGING COST	\$1,650.00	\$705.31	\$256.79
FUEL COST	\$50.23	\$10.08	\$60.16
SANITIZATION COST	\$0.00	\$81.85	\$81.85
EOL COST	\$82.96	\$27.38	\$0.73
TOTAL COST	\$1,783.19	\$824.62	\$399.53
LABOR COST ADJUSTMENT	-\$496.04	\$0.00	-\$186.02
TOTAL LABOR-ADJUSTED COST	\$1,287.15	\$824.62	\$213.51
COMPARED TO BOXED CEREAL	100.00%	64.07%	16.59%

An economic analysis was modeled after the LCA to determine the financial impact of each of the systems. The model specifically reflects the cost of selling Golden Temple of Oregon's cereal at the Isla Vista Food Cooperative as modeled in the LCA. The above table demonstrates the costs of using each system for every 5,000 kg of Golden Temple cereal sold by the Isla Vista Food Cooperative. The findings indicate that Marketainer's overall life-cycle cost is nearly 75% less than the current bulk system, and nearly 85% less than the disposable packaging system.

SUPPLY CHAIN IMPLEMENTATION

MANUFACTURERS

Manufacturers purchase heavy-duty reusable bulk bins and fill them with their products. Once purchased, they have the option of customizing any bulk container with their own labels or advertising. By adopting the Marketainer system, manufacturers will be able to:

- ▶ Save on packaging costs -- we found that our bulk bins pay for themselves in only 20 cycles when compared to an equivalent amount of disposable packaging
- ▶ Reduce environmental footprint and reliance on disposable packaging suppliers
- ▶ Ship products with greater confidence
- ▶ Easily communicate product information (e.g. nutritional content) to consumers
- ▶ Integrate bulk bins with retailers using Marketainer dispensers, or use them to replace disposable containers

RETAILERS

Retailers purchase gravity-fed dispensing units and provide consumers with a swipe card for shopping with the Marketainer system. The Marketainer system will allow retailers to:

- ▶ Efficiently stock full bulk containers by plugging them into dispensing units -- the labor savings alone offered by our system result in an expected net gain of around \$230 per unit over its lifetime
- ▶ Automatically monitor the level of each product via the store's central computer
- ▶ Collapse empty bulk containers for easy storage and transportation
- ▶ Reduce product loss and spillage by requiring a card with a unique customer ID
- ▶ Streamline the check-out process with a simple swipe of the Marketainer card
- ▶ Save on labor costs from efficient stocking & check out

CONSUMERS

Consumers "buy-in" to the Marketainer system by obtaining a swipe card that creates a unique customer ID in addition to purchasing reusable personal containers. Benefits to the consumer include:

- ▶ Paying 15-35% less for bulk products at checkout¹
- ▶ Being able to purchase desired portion size
- ▶ Shopping quickly and conveniently through the bulk section without needing to weigh purchases or write down product codes
- ▶ Using their swipe card at the register to instantly account for all bulk purchases
- ▶ Having access to an up-to-date account of their purchases via a web interface which offers nutritional content, expiration dates, recipes, and coupons