Food Service Packaging **Life Cycle Inventory**

This peer-reviewed study from Franklin Associates Ltd. provides an extensive comparison of the energy and environmental performance of foodservice packaging products made with polystyrene foam and paperboard, including hot and cold beverage cups and sandwich "clamshells." Known as a life cycle inventory, or LCI, the study offers a cradle-to-grave picture of a product's environmental characteristics from raw material extraction to manufacturing to recovery or disposal.

The 2006 Foodservice Packaging LCI evaluated products across the full range of resource and energy use, solid waste generation and atmospheric and waterborne emissions. Comparisons were summarized for four key performance areas: energy, solid waste (weight), solid waste (volume) and greenhouse gas emissions.

The full report, Franklin Associates, Ltd., Final Peer-Reviewed Report: Life Cycle Inventory of Polystyrene Foam, Bleached Paperboard, and Corrugated Paperboard Foodservice Products (Prepared for The Polystyrene Packaging Council, March 2006), may be downloaded at www.dartcontainer.com. This LCI meets international standards (ISO 14040) and has been independently peer-reviewed. More information on the peer-review can be found on page PR-3 of the full report.

About Life Cycle Studies—What is an LCI?

A life cycle approach takes into consideration that the choices we make as consumers and manufacturers affect our environment across a broad spectrum. An LCI compiles and quantifies the many inputs and outputs of a given product system, making it possible to understand the overall burdens a product may place on the environment. This LCI reviewed foodservice packaging products, including hot and cold beverage cups, plates and sandwich clamshells. LCI studies include a system analysis that begins with the extraction of materials and assesses such factors as materials and energy use and releases to the environment throughout product manufacturing, transportation, use and management at the end of use. LCI studies are an essential source of information for governments, scientists, manufacturers, retailers and individuals who want to make educated environmental choices.

In Public Policy

LCI studies are particularly important in the public arena, where they can help policy makers arrive at well-informed decisions and avoid the shortcoming of focusing on a single environmental performance aspect. The 2006 Franklin LCI provides comparative information on air, water, solid waste and energy as well as a complete range of post-use options, such as recycling, composting, landfilling and waste-to-energy incineration. This enables policy makers to evaluate these factors in the broader context of other important environmental factors spanning the product life cycle.

In the Foodservice Industry

Similarly, decision makers in the foodservice industry can assess the study's findings in combination with other important criteria, such as cost, convenience and product performance, to make better-informed choices about the products they use.

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Report Highlights

Comparisons were summarized for four key performance areas: energy, solid waste (by weight), solid waste (by volume) and greenhouse gas emissions.

- In the four key areas, the LCI study demonstrates that in most cases the alternative products studied have environmental burdens higher than or comparable to polystyrene foam products. These alternative products include plastic-coated paperboard cups for hot beverages (both with and without a corrugated sleeve), plastic-coated and wax-coated cups for cold beverages and paperboard clamshells (p. ES-16; pp. 2-60 through 2-63).
- According to the data (derived from pp. 2-7, 2-23, 2-43, and 2-60) for the average plastic-coated paperboard cup and average polystyrene foam cup, the practice of "double-cupping" plastic-coated paperboard cups results in over twice as much energy use and solid waste by volume and over five times as much solid waste by weight as the use of a single polystyrene cup.
- An average-weight polystyrene hot beverage cup requires about one third less energy to produce than an average-weight polyethylene (PE) plastic-coated paperboard hot beverage cup with a corrugated cup sleeve (Table 2-2, p. 2-7).
- An average-weight polyethylene (PE) plastic-coated paperboard hot beverage cup produces almost three times as much total waste by weight as an average-weight polystyrene hot beverage cup (Table 2-10, p. 2-23).
- An average-weight polyethylene (PE) plastic-coated paperboard hot beverage cup with a corrugated cup sleeve produces almost five times as much total waste by weight as an average-weight polystyrene hot beverage cup (Table 2-10, p. 2-23).
- An average-weight polystyrene cold beverage cup requires approximately half as much energy to produce as a representative-weight wax-coated paperboard cold beverage cup (Table 2-3, p. 2-8).
- An average-weight polyethylene (PE) plastic-coated paperboard cold beverage cup produces almost two and one-half times as much total waste by weight as an average-weight polystyrene cold beverage cup (Table 2-11, p. 2-24).
- A representative-weight wax-coated paperboard cold beverage cup produces almost five times as much total waste by weight as an average-weight polystyrene cold beverage cup (Table 2-11, p. 2-24).

Sources

Franklin Associates, Ltd. *Final Peer-Reviewed Report: Life Cycle Inventory of Polystyrene Foam, Bleached Paperboard, and Corrugated Paperboard Foodservice Products.* (Prepared for The Polystyrene Packaging Council, March 2006)

Franklin Associates, A Division of ERG, *Life Cycle Inventory of Foam Polystyrene, Paper-Based, and PLA Foodservice Products.* (Prepared for The Plastic Foodservice Packaging Group, Februrary 2011)

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