Preventing packaging waste

by Jim Jensen, David Stitzel, Rey Sundal and Vikki Van Duyne

Everyone wins when packaging waste is reduced and functionality and performance are maintained.

Each year, the packaging industry does roughly $84 billion worth of business. It's the third largest industry in the country, larger than most of the industries it serves, and it employs more people than any other single industry (1).

The waste generated from this tremendous amount of packaging is, unfortunately, all too often ignored. If businesses consider packaging waste at all, many think of it as a necessary cost of doing business. They may not take time to consider alternatives, the environmental costs of their decisions or the impact on their customers. However, examining the realities of business economics and competition can help managers see the obvious — packaging waste costs businesses money.

With this in mind, the Snohomish County Solid Waste Management Division in Everett, Washington initiated the Packaging Waste Prevention Project. This unique project was developed to match varied business types, both large and small, with packaging experts who could help identify opportunities to improve the economic and environmental benefits of packaging, while maintaining functionality and performance characteristics.

Targeted packaging included "receiving packaging" that arrives from upstream suppliers, "shipping packaging" sent to downstream customers and "in-house" or "process packaging," which has an in-house life linked to production, assembly, manufacturing and other handling processes.

Costs of packaging waste

Packaging waste received from suppliers can quickly affect bottom-line profitability:

- The costs of packaging with excess weight or unnecessary materials are passed on to the customer, embedded in higher prices.
- Excess packaging means more garbage to physically manage and higher disposal costs.
- Recycling old packaging is great, but it can cost time, money and storage space. Choices about shipping and in-house packaging choices affect profitability and competitiveness too:
  - Unnecessary or dual packaging increases purchasing, production and labor costs.
  - Extra weight or material adds to transportation costs by "cubing out" a truck more quickly or simply by requiring more gasoline.
- Bulky packaging means more storage and handling costs in-house.
- Disposable or single-use packaging costs more in the long run because of the raw materials, energy and other resources used in their production, procurement, distribution and disposal.
- Packaging that won't meet environmental regulations in other states or countries can limit potential markets.
- Nonrecyclable packaging increases customer disposal costs and reflects poorly on the product and company of origin.
- Litter from fast food and other kinds of disposable packaging is a form of environmental pollution that creates a negative public image.

Free expertise — everybody wins

The consultant team proposed to the Snohomish County Solid Waste Management Division that a variety of packaging design and engineering firms be contacted and placed on
a voluntary, on-call list. The consultants then used this list to match up a specific packaging reduction opportunity with the expertise of a given packaging firm.

This arrangement well-suited the county, providing it with the ability to provide free packaging reduction expertise to its business community in a manner that significantly leveraged project dollars. Participating businesses benefited from the provision of free, no-strings-attached packaging advice. Packaging companies were linked up with businesses that were not currently their clients. Participating businesses were always given the option of working with their existing packaging vendor, although most chose to get a new, second opinion from the packaging firms available through this project.

This approach met with great success and was responsible for forging several lasting relationships. It further served to educate the packaging design and engineering community about waste prevention principles. Perhaps most importantly, the approach informed local packaging professionals that there is a business interest in preventing packaging waste and that assisting businesses in realizing such savings could provide them with a marketing edge.

Who participated?
Project staff made a deliberate effort to contact businesses from various sectors, including manufacturing, wholesale and distribution, retail and service. Potential participants were selected from county Standard Industrial Code listings, Chamber of Commerce lists, business license lists and other compilations of county businesses. An initial screening telephone call was made to managers of selected businesses in an effort to determine whether sufficient opportunities for waste prevention existed to warrant an on-site visit.

Recruitment was no easy job, despite project staff’s emphasis early in the phone screening conversation that a primary project goal was to save the business money and that we had already met with success with other businesses. (Frequent initial responses — and our rejoinders — can be found in the sidebar.)

Successful phone recruitment required both a receptive business and a project staff person who could convince the business of the merits of an on-site visit. Once project staff were on-site, opportunities for packaging reduction generally made themselves clear during the tour. Then it was a matter of working with the business to pursue the opportunity, perhaps by allowing a follow-up visit with a packaging designer or engineer (2).

Ultimately, the project team screened several dozen companies about packaging issues and eventually identified 26 companies to receive direct technical assistance. The participating businesses included manufacturers, wholesale and distribution companies, retail businesses and service companies.

Numerous packaging prevention methods were kept in mind during a facility visit. The “Opportunities” box provides an overview of packaging methods and principles drawn on throughout this project.

How did it go?
Project staff measured each case study in terms of tons and volumes diverted and avoided disposal and purchasing costs. When possible, other savings, such as labor and energy use, were also estimated.

More than two dozen businesses were assisted by the project, with 13 actually making changes in packaging. In some cases, the packaging changes implemented were rather minor — using smaller bags or thinner strapping, or changing from bleached to unbleached paper. Other businesses implemented major changes in their packaging systems. In every case, when businesses reduced their packaging — whether through little changes or big steps — they saved money.

The total savings realized by all the participating businesses, through less material used and more efficient work, is more than $400,000 dollars per year. The benefits of packaging reductions also included cuts in
Initial business responses during recruitment

“There isn’t anything my business can do”
Businesses can do more than they may realize. Packaging waste makes up one-third of all commercial garbage, making it an easy place for businesses to improve their waste management practices and reduce the costs associated with waste disposal and packaging.

“We already tried this a few years ago”
Technology is continually changing. New packaging products are readily available that will save money by decreasing the amount of material used, using recycled-content materials and increasing recyclability.

Competition among packaging suppliers has also increased. Many packaging manufacturers may be willing to work to design a new package with less material or with recycled materials because they don’t want to lose a company’s packaging business.

The movement toward products that are environmentally responsible is in full swing. In the last few years, markets for recycled and recyclable materials have dramatically changed and companies want to be viewed as doing the right thing.

“Our company recycles, we’ve done our part”
Recycling is only the beginning of the changes a business can make to save money and be environmentally responsible. Consider eliminating unnecessary packaging that has become routine over the years. Many companies fear that if they change anything about their product, the customer will not like it. Throughout this project, we found that many packaging reductions were viewed favorably by customers and often presented promotional opportunities for companies.

Furthermore, purchasing packaging materials that have recycled content helps sustain the markets for the materials being recovered. The greater the demand for products made with recycled content, the more demand there will be for the recyclables. This helps reduce disposal costs and the price of new recycled-content products.

the amounts of waste generated or disposed. In addition, greater attention to preventing packaging waste helped improve recycling programs at many participating businesses. Two case studies illustrate the type of savings businesses can realize.

Alpine Windows
With 400 employees, Alpine Windows is one of the largest window manufacturers in the Pacific Northwest. As a participant in the Packaging Waste Prevention Project, Alpine Windows worked to eliminate the wood crating used by vendors when shipping window glass. It also sought to reduce packaging waste received from suppliers of the extruded vinyl pieces used to make window frames.

Bundles of the vinyl pieces were shipped from a local vendor in a four-part package — thin polyethylene film between extrusions, LDPE film to cover a whole bundle, wood two-by-fours for structure and metal strapping to hold it all together.

Two important changes were made. First, the wood two-by-fours have been replaced by reusable vinyl two-by-fours, saving thousands of linear feet of wood every year. Although none of the wood had been disposed (employees used it for home projects or firewood), the new system cut costs for Alpine’s supplier, and both companies recognized the value of conserving this valuable resource.

Second, the project team worked closely with Alpine Windows and its vinyl supplier to establish a three-step backhaul process for returning the LDPE from Alpine, through the supplier, back to the plastic’s manufacturer. In the process of investigating this valuable exchange of material, Alpine identified a company that would pay for the LDPE and for shrink wrap collected from other receiving areas. The amount received from the buyer will likely cover the cost of baling the plastic and, in the process, Alpine has removed a large volume of material from its roll-off container; the savings in disposal tip fees will exceed $150 per month. More importantly, removing the high-volume material will make the use of the roll-off container and associated rental and transportation costs more efficient.

The biggest success for Alpine Windows was the switch from receiving glass shipments in wood crates to a new system called “glass pack,” which uses a special truck, slings and tarps to eliminate transport packaging altogether. Previously, Alpine’s glass supplier was charging $50 each for the 12 to 24 crates that Alpine received each day, and none of them could be returned.

Rather than being a disposal problem, the crates became an expensive (about $900 per day) pile of free wood, which scavengers in the community gladly took for personal use. Once every couple of months, an Alpine truck took the broken remnants of the pile to a wood recycler, at an average cost of about $200 per trip.
The new glass pack system eliminates the use of wood crates. Instead, the large glass sheets are shipped on a specially designed truck covered by tarps and tiedowns. A special forklift removes the glass sheets from the truck using a spreader bar and slings.

In addition to saving almost $230,000 in annual costs for the crates, the glass pack system is more efficient. Alpine managers estimate that the new system saves five to six labor hours per day, or about $35,000 per year. The savings in materials from eliminating the use of 4,500 crates each year are equally impressive.

Composite Materials
Composite Materials, a fiberglass fabric sheet manufacturer, distributes woven fiberglass fabric. When the Snohomish County Packaging Waste Prevention Project began working with Composite Materials, the company’s greatest packaging concern was the cardboard boxes used to ship each product roll. Company managers wanted to see if a reusable shipping system could be developed that would save money and minimize disposal costs.

At the time, the company wrapped each roll of product in a separate cardboard box, at an approximate cost of $2 each. These boxes were a disposal problem for customers, who had to throw them away or get them recycled, sometimes at great cost in fees and labor.

Project team members found that roughly 90 percent of the product rolls fit into one of three length categories and would be suitable for a reusable, bulk transport system with three main pallet designs. The diameters of the rolls were found to be all roughly the same, regardless of their weight. This would allow a reusable system to accommodate various product lines.

Team members found that the company had a few large, local customers to which it supplied larger quantities of the product, often in the form of an entire pallet of fiberglass fabric rather than a few rolls — ideal for experimenting with a new packaging concept. Returning the reusable items was considered practical because the company was already backhauling resin and foam from a few customers. This became the target packaging reduction pilot project.

A packaging engineer, participating as a technical advisor to the project, designed a reusable system using durable, reusable dividers. The dividers were nestable, enabling several to be stacked on a standard pallet for backhaul.

A question that arose early on was what material to use for the dividers. Although polyethylene foam would make suitable dividers, the foam required tooling, at a cost of
about $500. However, a demonstration version could be made using hand-cut polyethylene foam that could help prove the concept of the bulk pallet, while avoiding the upfront tooling cost. An alternative divider could be made from expanded polystyrene. This would be a cheaper, though shorter-lived, alternative. The third alternative, which was eventually chosen, is made from molded, mostly recycled paper fiber.

Although the initial cost for the reusable system seemed high, the company liked the idea and the design. It knew it would eventually save money by not buying expensive boxes for one-way shipments; it also expected savings in labor spent packing boxes. Additionally, the company would help its customers save money by cutting packaging waste.

After trial runs with the new system, the company’s regional manager is “very pleased with it and expects to save considerable money.” In purchasing costs alone, the company expects to save over $9,500 per year. The company also anticipates fuel savings due to the lighter pallet weight of the reusable system (12 pounds versus 54 pounds of packaging per pallet). The new system has also reduced packing time. Combining purchasing, transport and labor savings, the company anticipates savings of close to $15,000 per year.

Finally, the project team estimates that 15,010 pounds of paper packaging material will be avoided each year, conserving resources and preventing needless waste.

Wrapping it all up
As the packaging prevention pilot came to a close, the project team shared successful case studies with other members of the Snohomish County business community. Presentations were made to business associations and the Chamber of Commerce highlighting the accomplishments of the program. When possible, attendees were referred to peer companies that had successfully minimized packaging waste. A guidebook was also assembled and will be distributed to the county’s business community (3).

Notes
(1) Summary information from Robert F. Testin, Professor of Packaging Science, Clemson University, in a 1994 training session, “The Science of Packaging: Beyond Store Shelves and Landfills.”
(2) Businesses were often more interested in recycling assistance during the initial phone call, and would accept a visit if they thought they could get recycling information. This allowed a useful foot in the door during recruiting. Although project staff made appropriate referrals and attempted to address recycling issues, every effort was made to bring the conversation around to packaging reduction.
(3) Copies of the Packaging Prevention Guide and the project’s final report are available on request from Roy Sundal, (206) 388-6488.

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Resource Recycling  September 1996  55