AdeptPackaging
ENGINEERING PACKAGING EXCELLENCE

A Combined Approach to Cost Savings and Sustainability

Revisit Cost Savings Through a Sustainability Lens

An Adept Packaging White Paper

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With the global economy still wrestling with the impact of the COVID-19 pandemic, priorities have shifted for many businesses around the world. In the U.S. alone, second quarter GDP is expected to fall by more than 50% driven by a decrease in consumer spending. Loss of revenue has forced businesses to put many innovations, including sustainability initiatives, on the back burner while they focus on keeping costs down.

This does not have to be the case. By reframing cost-savings programs through the lens of sustainability metrics, it's easy to find many areas where savings and sustainability coexist.

While consumer expectations have shifted during the pandemic, it's unlikely that sustainability will be completely deprioritized, especially with millennials and Generation Z. Time will tell if it's dropped down consumers' priority list when purchasing a product, but companies that can highlight sustainability and deliver a safe product will have a decidedly strong market position. The pandemic has temporarily cut carbon emissions globally, but it's not going to change the science of climate change. The packaging value chain will continue to have the environmental impact it's always had.

Packaging sustainability is more important than ever in the consumer goods space because packaging is being purchased and consumed at historical rates, and residential waste volume has increased by as much as 40% in some areas. This surge in waste, coupled with the collective belt tightening prompted by the pandemic, means the packaging community needs to think creatively about sustainability and how it can turn these proverbial lemons into lemonade.

Cost Savings Considerations

Outlining a cost savings approach and defining sustainability metrics independently provides a basis for identifying the steps that benefit both. It is helpful to take a holistic approach to cost savings by breaking a package down into constituent parts and evaluating direct and indirect costs tied to each component – some refer to this as a total cost of ownership approach.

The broad direct and indirect factors that affect packaging costs can be separated into three categories:

- Materials
- Conversion of those materials into a functional package
- Transportation and storage of the package and its contents

Materials:

A good first step to evaluating materials for costing purposes is identifying why each material is used. Some are chosen for functional purposes, some for aesthetic considerations and others for regulatory requirements. Many materials are selected based on a combination of those factors, and understanding the primary driver behind the selection of each material provides an opportunity to challenge any preexisting assumptions or biases driving those decisions and find opportunities to save on costs.

It is also important to consider the composition of each material. If there is color, the source may be pellet, liquid or powder, and each of those color systems have different price implications. In multi-layer packaging, each layer should be assessed to ascertain its necessity. The use of additives, adhesives, laminates and other materials should be reviewed to determine if they're necessary or if they can be used in lesser concentrations. There is a nearly limitless number of ways material can impact cost, and careful consideration by an expert helps to identify the decisions that have the greatest impact on costs.

Conversion of Materials:

The second major step to evaluating the cost of your packing is to consider the conversion process for those materials and ensure that the most efficient conversion process and equipment are being utilized for a particular package. Some conversion processes are better suited for high-volume, highly uniform runs, while others are better for low volumes with greater variation. Packages may be designed in a way that that limits them to a specific conversion process, but that process is not always the most efficient. Careful examination of the design may reveal ways to decrease the package size and amount of materials used in the conversion process without sacrificing the package's protective properties. Optimizing the size of a package presents many opportunities to improve the design from both a cost perspective and a sustainability perspective.

Transportation and Storage:

When considering transportation of a package's components, their shipping journey, from origin through arrival at the filling location, should be up for review. Some components may be produced domestically, while others come from overseas via ocean freight. They can be shipped in full truckload quantities or less-than-truckload (LTL) shipping. Other factors impact the cubic efficiency of the unit load as it is received at the filling location. In some circumstances, items need to be shipped to a third party for certain finishing elements, such as labeling or decoration. Every step of this material flow should be examined to determine if it can be accomplished more efficiently or eliminated altogether.

In addition to transportation methods, it's also important to consider how replenishments are made. For lower volume items, understanding how a minimum order quantity (MOQ)) stacks up against an economic order quantity (EOQ). The difference between the two may be great enough to justify larger orders that deliver a lower per-unit cost. Weighing the value of an EOQ provides an opportunity to examine ordering costs, shipment costs, and inventory handling and holding costs. Each of these costs should be reviewed carefully, as they add up to create a significant impact on optimizing the cost of your packaging supply chain.

Sustainability Considerations

The metrics established by the Sustainable Packaging Coalition (SPC) provide an excellent resource for evaluating your sustainability efforts. The SPC focuses on the power of industry to make packaging more sustainable, and its membership includes brand owners, material converters, government agencies and academic institutions.

Its members publish sustainability goals based on the coalition's metrics, which are separated into two buckets – packaging metrics and corporate metrics. Packaging metrics are associated with all items that relate to a package or any packaging material that will find its way onto a bill of materials. Corporate metrics are a broader umbrella that covers not only to the package, but also the plants, property and equipment that an organization operates.

Packaging Sustainability Metrics

When thinking about packaging metrics, it's helpful to begin by thinking about unfavorable materials such as Polyvinylchloride (PVC). This material has been banned by a number of organizations for many years due to the harmful effects of chlorine and more notable chlorofluorocarbons (CFCs) that harm the earth's ozone layer. Another harmful material is BiSpehnol A (BPA), which was once commonly used in metal and aluminum can linings and other plastics. BPA is mildly toxic and if not disposed of properly can be harmful to humans or to the environments where they end up. For example, any litter that does not find its way to a proper landfill can harm the micro-environment directly around it. These are just two examples

of well-known harmful materials that should be limited, and as end-of-life considerations become more important in packaging, this list is likely to grow.

Material efficiency is another key packaging metric and can be defined as using the correct amount of material in the correct quantities to achieve the intended lifecycle of the package. Material efficiency can sometimes be sacrificed in service of speed to market, as packaging engineers utilize additional barrier materials to decrease the probability of product/package compatibility issues so that products can launch before packaging tests are completed.

For example, a flexible food pouch or hair gel tube can launch with an EVOH barrier in parallel with testing on mono-layer material packaging. If the mono-layer material is approved, the package will transition into that mono-layer structure, essentially wasting a number of months in a package that is likely not recyclable and utilizes an additional material that was never needed in the first place. In the worst-case scenario, the multi-layer structure remains in place as other priorities take precedent or engineers shuffle within departments.

Another packaging metric to track is volumetric efficiency. It is helpful to think of this as the volume of usable product compared to the saleable unit for the end-user. The end-user in this case could be a retailer that receives pallets of product at a distribution center or the consumer that picks a product off the shelf and takes it home. Cosmetics and skincare brands are notoriously bad at managing volumetric efficiency. Selling mascara in a thermoform-backed SBS card or putting a small eye cream jar in a grossly oversized carton is standard industry practice, but it is easy to see these are examples of poor volumetric efficiency. These products are placed in packers, which then go into RSCs that are loaded onto pallets. These pallets can consist of as much as 50% air. Cutting down on excess packaging and concentrating usable products is a key step to enhancing sustainability, with the added bonus of reducing costs for materials.

Packaging Sustainability Metrics:

- Bio-based / Renewable Materials
- Eliminate Unfavorable Materials
- Material Efficiency
- Design for recovery
- Improving recovery infrastructure
- Recycled content
- Responsible fiber sourcing
- Increases in recycling
- Volumetric Efficiency

Corporate Sustainability Metrics

Energy consumption is one important way to measure corporate sustainability, and material choice plays a significant role. Glass, for example, has best-in-class barrier properties and is widely recycled, but it is notoriously energy-intensive. Shutting down and restarting glass furnaces can take hundreds of hours, resulting in lost time and significant financial losses, so they must run 24 hours a day at more than 1,500 degrees Celsius, consuming substantial amounts of energy. In contrast, producing plastic is much more energy-efficient, as production equipment can be turned on and off relatively quickly. In addition, melting temperatures for plastics are significantly lower than glass, and most of the melting temperature is generated through sheering force in the barrel. On average, glass takes about twice as much energy to produce as plastic, so it's important to understand the energy consumption requirements for different materials to plan a sustainable package solution.

It is no secret that greenhouse gas emissions, most notably carbon emissions, are strongly correlated with global temperatures. As the concentration of Co2 in the atmosphere increases, so do global temperatures. The number of miles a package must travel between its conversion location and its filling location, along with the mode of transportation and type of fuel used, plays a significant role in determining packaging's carbon footprint. The choice between partial truckloads and full truck loads also plays a key role. Researching and comparing multiple options for these factors can uncover optimal solutions for cutting down on carbon emissions from packaging, and often those solutions are also the most cost effective.

Corporate Sustainability Metrics:

- Energy Consumption
- Greenhouse Gas emissions
- Manufacturing Operational Waste
- Renewable Energy / Alternate Energy
- Water Consumption

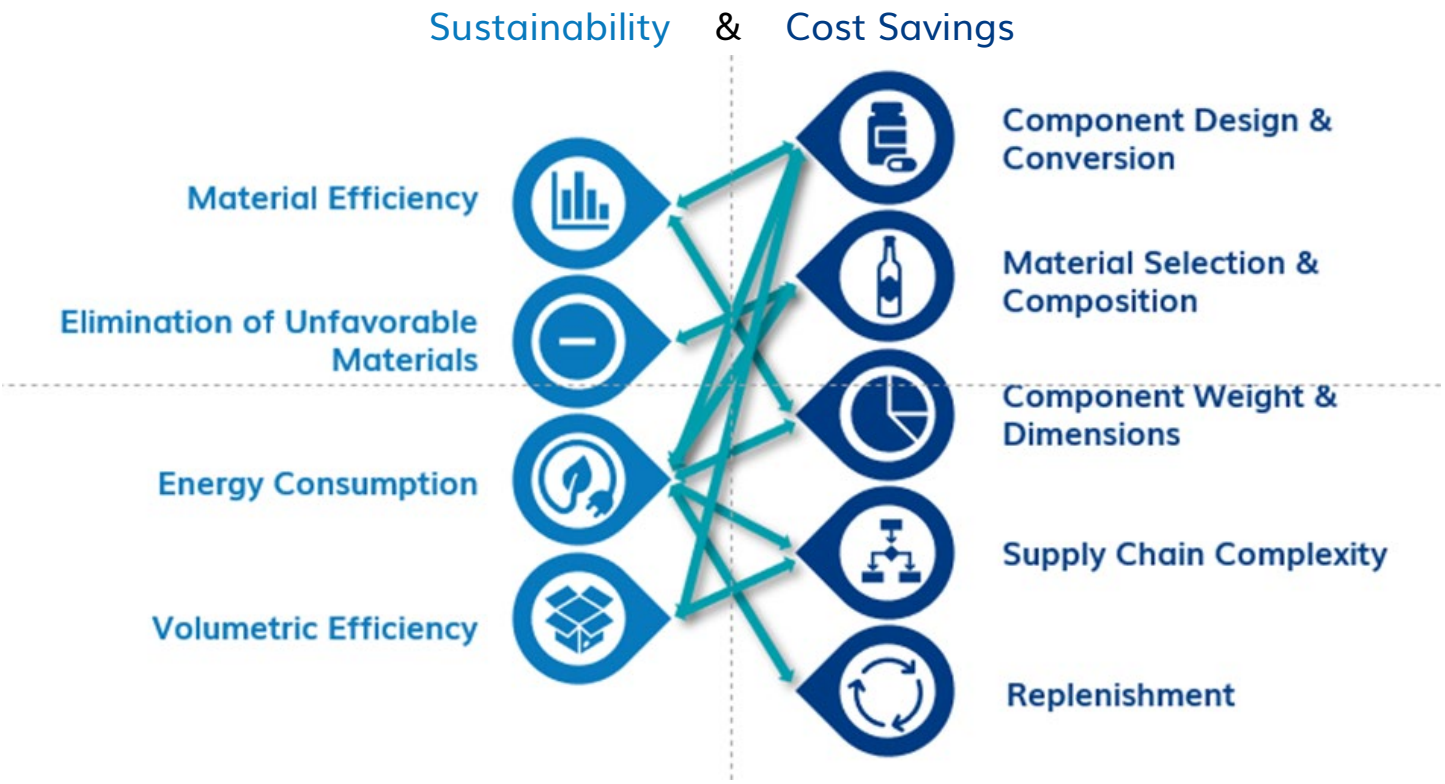
Identifying Commonalities

Once potential approaches to both cost savings and sustainability are clearly defined, the areas where the two overlap become easier to identify. A few areas of overlap jump out in examples discussed in the sections on Cost Savings and Sustainability, but the multi-layer film example provides opportunity to highlight several areas of overlap.

Removing a barrier layer is a way to provide material efficiency for sustainability, but it also has cost advantages, and any procurement team should use the removal of this layer as leverage to negotiate a

better cost. A procurement buyer can also increase order quantities for a package, which provides an opportunity to reduce shipments from the converter from a monthly basis to quarterly. Suppliers will be able to fully cube or weight out outbound shipments, reducing road miles for incoming packaging and reduced carbon emissions. On the converter's end, this could cut down on raw material inputs, which means fewer carbon emissions from their supplier, and so on. Working in parallel, this approach can have cost advantages through optimized economies of scale from the buyer, as set-up costs and overhead are stretched out over larger volumes.

As another example, choosing cheaper materials with lower carbon footprints, such as choosing plastics instead of glass and producing them with minimal additives, can be a win for both cost and sustainability. By limiting color percentages, mold release agents, UV inhibitors for clear packages, or the use of oxygen scavengers, these pieces can deliver a more environmentally friendly package that may have an increased likelihood of being recycled, all at a reduced cost for the buyer.



Recommendations for Securing Buy-in

Taking the time to think about how cost savings programs can overlap with sustainability metrics is a straightforward thought exercise once clear metrics are established, but getting buy-in from leadership and putting a plan into action may be more difficult. A few simple steps can go a long way to getting the entire team on board:

- Establish and communicate clear, quantifiable baseline metrics across all packaging within scope. Starting with an objective number eliminates subjectivity from the decision-making process and makes it easier to prioritize projects that can benefit the most from cost/sustainability optimization.
- Employ a life cycle analysis (LCA) process where applicable. This is a great way to quantify corporate sustainability metrics, and many companies already have LCA capabilities in place.
- Build a scorecard that aligns with the organization's priorities. Different companies require a different balance between sustainability and cost savings; developing a scorecard that reflects the company's values is the most effective way to present quantified, objective criteria for the program's success.
- Leverage resources both within and outside the packaging department. Packaging engineers frequently work with departments ranging from product development and operations to marketing and quality assurance, but don't be afraid to liaise outside this group. Seek out the technical staff that support the sales reps to find out how energy efficient their process is. Find the people who know the shipping logistics of incoming packaging and ask about how materials are received and where they come from. Departments that aren't directly involved in packaging can be valuable sources for information that can improve sustainability and cost savings efforts.

Adept Packaging Can Help

Rethinking long-standing practices and finding more efficient, sustainable ways to approach packaging can seem like daunting projects, but breaking them down in actional steps can provide a roadmap that simplifies the process. It also helps to have an experienced partner to help lead the way. We helped our clients save more than $117 million in 2019 and our team has the resources, tools and expertise to guide companies through any stage of their sustainability journey. If you're ready to push your organization's sustainability goals forward while driving cost savings in your packaging department, get in touch.