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How to Assess Sustainable Packaging:
An Overview of The Tools and Resources Available

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Goal: Develop a methodology for assessing packaging sustainability in order to drive innovation throughout the supply chain.

Approach: Many tools and resources exist for assessing packaging sustainability. Through a discussion of the available tools and various analytical models on which said tools are built, a packaging sustainability strategy will emerge; this will inform what tool should be implemented and how.

Assumption: Packaging sustainability requires corporate sustainability strategy goals and packaging sustainability policy; it requires metrics to benchmark and measure performance; and, tools and resource to support decision-making.

About this report: This document was prepared by Dordan Manufacturing Co. Inc. at the interest of its clients and supply chain partners. It is a compilation of information derived from LCA practitioners' presentations, emails, and independent research. Please consult document footnotes for further reference.

Step one: Determining corporate sustainability goals

In order to develop a sustainable packaging policy as the foundation for assessing sustainable packaging, a corporate sustainability strategy is required. What are the sustainability goals of your corporation? Consider the following:¹

- Regulatory compliance
- Risk management
- Marketing
- Reduce packaging/product waste
- Increase recycled content
- Reduce greenhouse gases
- Reduce water consumption
- Increase use of renewable resources

Step two: Understanding life cycles

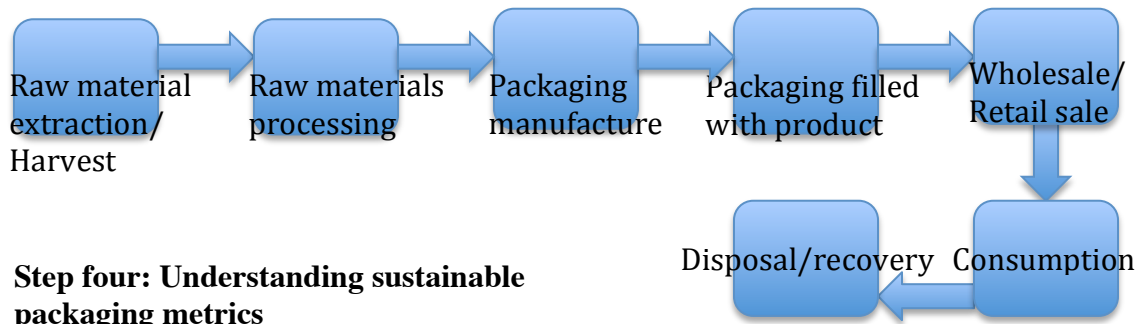
“Sustainability” is often times best quantified for corporate implementation via life cycle modes of thinking. Consequently, many of the tools available for assessing packaging sustainability revolve around an LCA-based approach that requires a baseline

¹ Sustainability goals provided via Dr. Karli Verghes's presentation, “Developing the Corporate Strategy for Packaging Sustainability and Integrating Evaluation Tools into the Product-Packaging Developmental Process,” at Pira International's 6th Annual Sustainability in Packaging Conference, The Omni Orlando Resort at Champions Gate, March 13th-14th, <http://www.sustainability-in-packaging.com/home.aspx>.

off which progress can be gauged, utilizing the available metrics and indicators to inform design decisions. Consider the opportunities facilitated via LCA-based modes of thinking when assessing “sustainability:”²

- Greater clarity on where materials come from and how they are made
- Strengthens your position on selecting materials/design that align with packaging and sustainability strategies.
- Identify hot spots for further investigation and reduction
- Identify opportunities for increased efficiency
- Reduce environmental impacts
- Respond to supply chain and consumer concerns

Consider the following example of an abstract packaging life cycle:³



Step four: Understanding sustainable packaging metrics

When assessing packaging sustainability via LCA modes of thinking, there are various “metrics” that inform the analysis. “A metric is the method used to express an indicator. Metrics are often computational or quantitative, but can also be a qualitative assessment. Metrics are typically expressed as a numerator and a denominator.”⁴

“Packaging attributes” are a class of sustainable packaging metrics that consider: functionality of each component, pallet efficiency – cube utilization, recyclability, compostability, product-packaging ratio, material sourcing, virgin material content, recycled material content, product protection (shelf life).⁵

“Life cycle impacts” are another category of metrics employed, which consider: Climate change, cumulative energy demand, resource depletion, water use, solid waste, eutrophication, land use, and photochemical oxidants.⁶

² Opportunities facilitated via LCA when assessing sustainability provided via Verghese.

³ Abstract packaging LCA diagram provided via Verghese.

⁴ Global Packaging Project, a global project of the Consumer Goods Forum, “A Global Language for Packaging and Sustainability: A Framework and a Measurement System for our Industry,” Sept. 2011, pg. 13, http://globalpackaging.mycgforum.com/allfiles/FinalReport_2011.pdf.

⁵ Packaging attributes provided via Verghese, “Developing the Corporate Strategy for Packaging Sustainability and Integrating Evaluation Tools into the Product-Packaging Developmental Process.”

⁶ Life cycle impacts provided via Verghese.

Both packaging attributes and life cycle impact metrics should be considered in discussions of sustainable packaging assessment approaches.

Step five: Understanding the available tools

Sustainable packaging assessment tools should facilitate simple workflow for the user, be intuitive, logical, and easy to communicate. The tool(s) should be able to fit within the company culture, require low set up time and have low data input requirements. Clearly presented results that make it easy to understand the benefits of the tool(s) are paramount, as are including issues that are relevant to the user on a daily basis; this will allow for easy integration into the product/package developmental process.⁷

There are several categories of tools that exist to evaluate “sustainability.” Only those that aid in sustainable packaging assessment have been included, however.⁸

- Guidelines: SPA Sustainable Packaging Framework, SPC Design Guidelines for Sustainable Packaging, WRAP (Guild to Evolving Packaging Design), Envirowise (Packaging Design for the Environment), Global Packaging Project’s Global Language for Packaging and Sustainability
- Packaging specific analytical tools: Walmart Packaging Modeling, Toyota (EPIC), P&G Scorecard
- Packaging specific LCA based analytical tools: PIQUET (Packaging Impact Quick Evaluation Tool), COMPASS (Comparative Packaging Assessment), Package Smart, PEAT (Packaging Environmental Assessment Tool), InstantLCA Packaging
- LCA software: SimaPro, Gabi

“Guidelines” are compilations of descriptions of different sustainable packaging metrics and indicators⁹. These can be used to answer specific business questions that pertain to the environmental performance of a product/package combination. When using Guidelines, one should: (1) define the business question, (2) determine the scope and boundaries, (3) select the metrics, (4) gather data and review data quality, (5) analyze the results, (6) communicate the business decision.¹⁰ For example, consider how P&G

⁷ Requirements when selecting tool provided via Verghese.

⁸ Categories of tools with examples provided via Verghese.

⁹ According to the GPP, “An indicator is used as a proxy for an issue or characteristic an organization wants to measure. An indicator describes a concept and can express movement – whether positive or negative – toward a goal. Generally, an indicator focuses on a piece of a system that can provide a sense of the bigger picture,” p. 13, http://globalpackaging.mycgforum.com/allfiles/FinalReport_2011.pdf.

¹⁰ How to use Guidelines provided via Alan Blake’s presentation, “Practical Applications of the Global Packaging Project,” at Pira International’s 6th Annual Sustainability in Packaging Conference, The Omni Orlando Resort at Champions Gate, March 13th-14th, <http://www.sustainability-in-packaging.com/home.aspx>.

used the GPP Guidelines in its assessment of the “sustainability” of concentrates for its Tide brand cleaning detergent:¹¹

Business question: What is the benefit of 2X compacted product?

GPP Common Metrics	Current	Proposed
Packaging Weight and Minimization	315 g	195 g
Transport Packaging Cube Efficiency	75%	68%
Packaging to Product Weight Ratio	4.92g/load	3.04/g/load
Climate Change (GHG)		Transportation savings?

“Packaging specific analytic tools” like the Walmart Scorecard assess packaging performance in the context of pre-determined corporate sustainability goals/sustainable packaging policy, like GHG emission reduction targets. They consider the different life cycles of the packaging/product combination like recovery and packaging attributes like material health yet have specific methodologies and assumptions integrated into the tool itself, which serve the end goal(s) of the specific firm.

“Packaging specific LCA based analytic tools” like COMPASS are more “objective” than company-originating analytic tools like the Walmart Scorecard because fewer methodologies and assumptions have been built into the tool itself; yet, are still tailored to a specific application (packaging). “For example, COMPASS provides a consistent data modeling across all materials, the only processes available are applicable to packaging, and end of life is modeled for packaging only. This makes the information accessible to non-LCA professional in a reasonably easy to use format.”¹² Packaging specific LCA based analytic tools have therefore streamlined the process insofar as all decisions requiring LCA expertise are pre-set, and the user simply manages information that s/he is familiar with such as packaging material, weight, palletizing patterns, transport modes and distances as well as material recovery post-consumer.

When Nestle was investigating the available LCA packaging specific tools available to integrate into their packaging developmental process, they wanted to evaluate the existing tools against a certain number of criteria including compliance with ISO14040 in terms of life cycle assessment methodology, ease and speed of use, how well populated the tool was with respect to inventories and how well it covers regional aspects.¹³ Nestle determined that PIQUET was the tool that best fit the bill, which “is an

¹¹ P&G Tide brand cleaning detergent concentrates GPP case study provided via Blake.

¹² Minal Mistry, “LCA tool inquiry,” an email message sent to cslavin@dordan.com, March 20th, 2012.

¹³ Nestle case study provided via Lars Lundquist’s “Driving Packaging Research in the Health Food and Wellness Industry,” at Pira International’s 6th Annual Sustainability in Packaging Conference, The Omni Orlando Resort at Champions Gate, March 13th-14th, <http://www.sustainability-in-packaging.com/home.aspx>.

online tool that identifies and reviews actions to reduce the environmental impact of food and beverage packaging, particularly at the design development stage.”¹⁴

“LCA software” like SimaPro: “Are tools for LCA professionals or practitioners. One needs a lot of knowledge about data, methodology, application, system boundary etc. to make a useable study that stands up to scrutiny. With LCA software can study making a car engine or a computer or a package, while in packaging specific LCA based analytic tools you can only study packaging.”¹⁵

Step six: Selecting the right tool

Consider the following questions; the answers to which should aid you in selecting the right tool, based on your specific business and sustainability strategy.¹⁶

- How easy is it to use?
- What is the life cycle system boundary i.e. what life cycle stages are included?
- What materials, converting processes and transport data is included?
- What databases are used and what are the regularity of updates and expansion of updates?
- Does this tool include both environmental life cycle metrics and packaging specific indicators and attributes?
- What is the need to use a tool i.e. guide strategies, provide quantitative data?
- What business questions are you looking to answer? What metrics to report? How does this link to the packaging strategy?
- Who in the organization will use the tool i.e. packaging technologist/designer vs. sustainability manager vs. procurement?
- What level of detail is required in the assessment i.e. the design context?
- What time, financial and human resources are available to support the use of the tool i.e. introduction of tool and maintenance?

Conclusion:

For Dordan’s clients and supply chain partners, LCA based packaging specific analytic tools like COMPASS, when used in reference to sustainable packaging Guidelines like the GPP, are currently the preferred categories of tools for assessing sustainable packaging. Packaging specific analytic tools like the Walmart Scorecard are too narrowly defined for varied business interests, and LCA software(s) like SimaPro require extensive expertise and resources for the successful implementation and

¹⁴ Sustainable Packaging Alliance, PIQUET, <http://www.sustainablepack.org/default.aspx>.

¹⁵ Mistry, in email.

¹⁶ Questions re: LCA tool provided via Verghese, “Developing the Corporate Strategy for Packaging Sustainability and Integrating Evaluation Tools into the Product-Packaging Developmental Process.”

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utilization. Therefore, a streamlined but packaging-specific LCA approach to sustainability assessment, when used in reference to the language of sustainable packaging metrics and indicators developed by the GPP, should aid product suppliers in achieving their corporate sustainability goals/sustainable packaging policy.

This report is not meant to be an exhaustive exposition of the issues at hand; rather, an introduction to the tools and resources available for assessing packaging sustainability, based on one's specific corporate and sustainability strategy. Dordan Manufacturing looks forward to aiding interested parties in these regards, always a resource for issues pertaining to packaging and sustainability.

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