Life Cycle Assessment (LCA) Webinar

June 25, 2014

CORRUGATED PACKAGING ALLIANCE

Welcome

Webinar Goals

- Discover:
  - what is an LCA?
  - why did we do it?
  - what did we find out?
  - what are we doing with the results?

- Answer your questions regarding the industry's efforts and any specifics as presented

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Corrugated Packaging Alliance

Agenda

- Overview of the LCA Study
- Available Materials & Tools
- Q&A

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LCA Study Overview

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LCA Study Overview

- Why did we do the study?
- Who were our stakeholders and what were their expectations?
- What did we hope to accomplish?

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Background

- Increasing pressure from product manufacturers and consumer retail markets to select environmentally preferable packaging options led to need for LCA
- The aim of the study is to generate high-quality, up-to-date data on the environmental impacts of corrugated packaging
- The study evaluates the performance of <u>an industry average corrugated container</u> throughout its entire life cycle, "cradle-to-cradle"

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Audiences

To whom will this LCA be directed?

- Corrugated Packaging Alliance (internal)
- Member CEOs, top management
- All industry members

Who are the potential external stakeholders to be addressed through the industry trade associations?

- Retailers, CPGs
- Government Agencies (Environmental Protection Agency)
- Non-government Organizations (NGOs)
- International corrugated community (ICCA, FEFCO)
- Academics, LCA practitioners, software providers

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Industry Average LCA

Purpose:

- Answer the question, "What is the cradle-to-grave impact of one kilogram of corrugated product on the environment?"

- Compare the results over time
  - First study used 2006 data, published 2009
  - Established original baseline
  - Current 2014 LCA shows results using 2010 data

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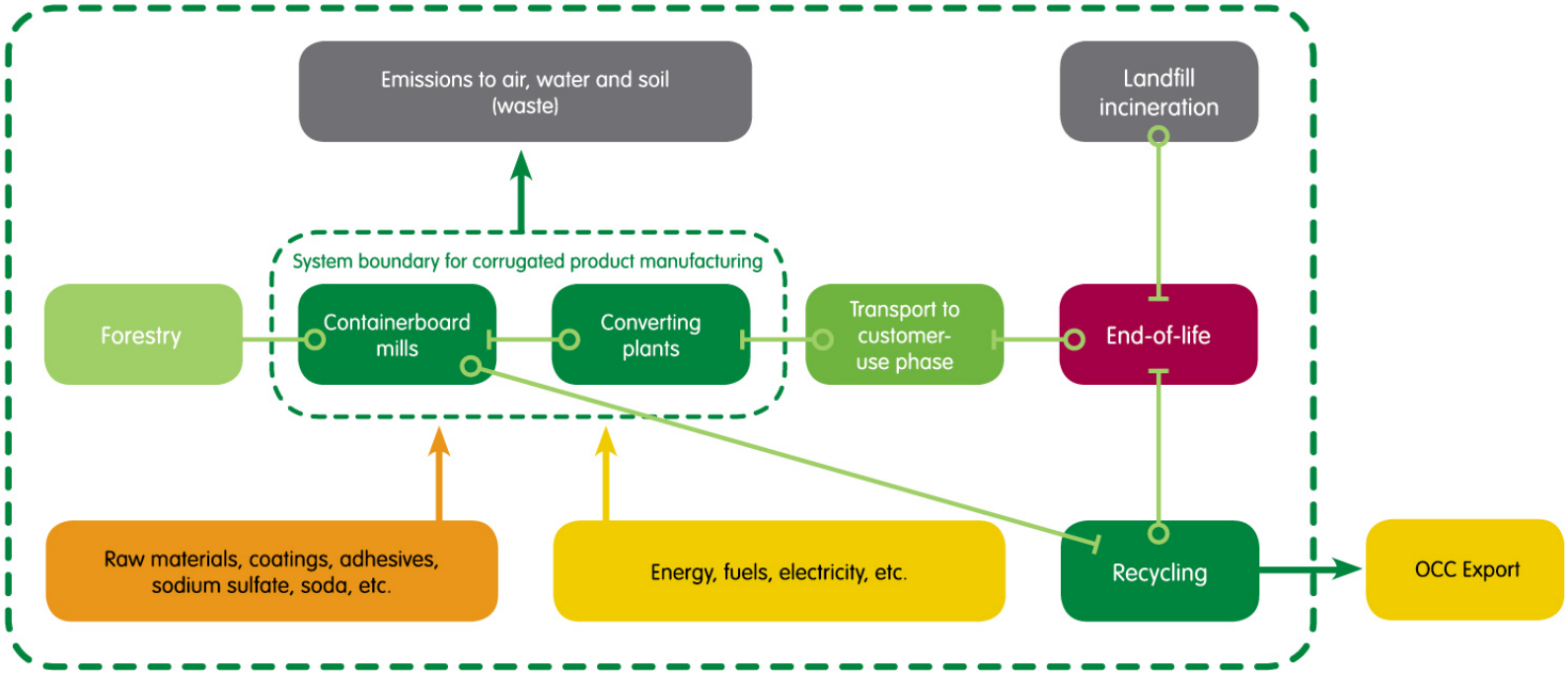
Scope

Figure 1.

System Scope and Life-cycle Phases for U.S. Average Corrugated Product
Summary of System Boundaries



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Product Systems

Functional Unit:

- Per kilogram of U.S. Industry Average Corrugated Product shipped

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Industry Average Box

- 70.1 percent linerboard and 29.9 percent corrugated medium
- average basis weight of 131.9 lb./thousand square feet (msf, 0.644 kg/m2).
- on average 46 percent recycled fiber

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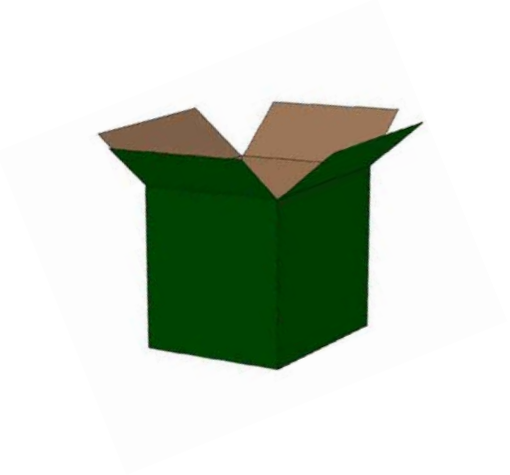
1 Kilogram Box – 32 ECT

- Style: RSC
- Inside Dimensions: 20 x 18 x 20
- Board Weight: 35#/26#C/35#
- Square Feet: 20.47
- Basis Weight: 108.18#/msf
- Box Weight: 2.2 lbs/ 1 kg



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Indicators Studied

- **7** environmental impact indicators:
  - Global warming potential
  - Ozone depletion
  - Photo-chemical oxidation (smog)
  - Acidification
  - Eutrophication
  - Respiratory effects (particulates)
  - Fossil fuel depletion
- and **4** inventory indicators:
  - Non-renewable energy demand
  - Renewable energy demand
  - Water use
  - Water consumption

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Process

- Study was performed by The National Council for Air and Stream Improvement (NCASI).
- The FBA Sustainability Committee provided technical review and oversight.
- CPA members, AF&PA Containerboard Kraft Sector members, and legal counsel from both AF&PA and FBA contributed significantly to the review process.
- A Critical Review Panel (CRP) of outside experts was engaged to review the study, assuring objective conformance to ISO comparative LCA standards.

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Critical Review Panel

LCA Expert Reviewers: (reviewed scope and study drafts)

- Mr. Jamie Meil, Athena Institute, review panel Chairman;
- Ms. Lindita Bushi, Athena Institute; and
- Ms. Melissa Hamilton, Earthshift

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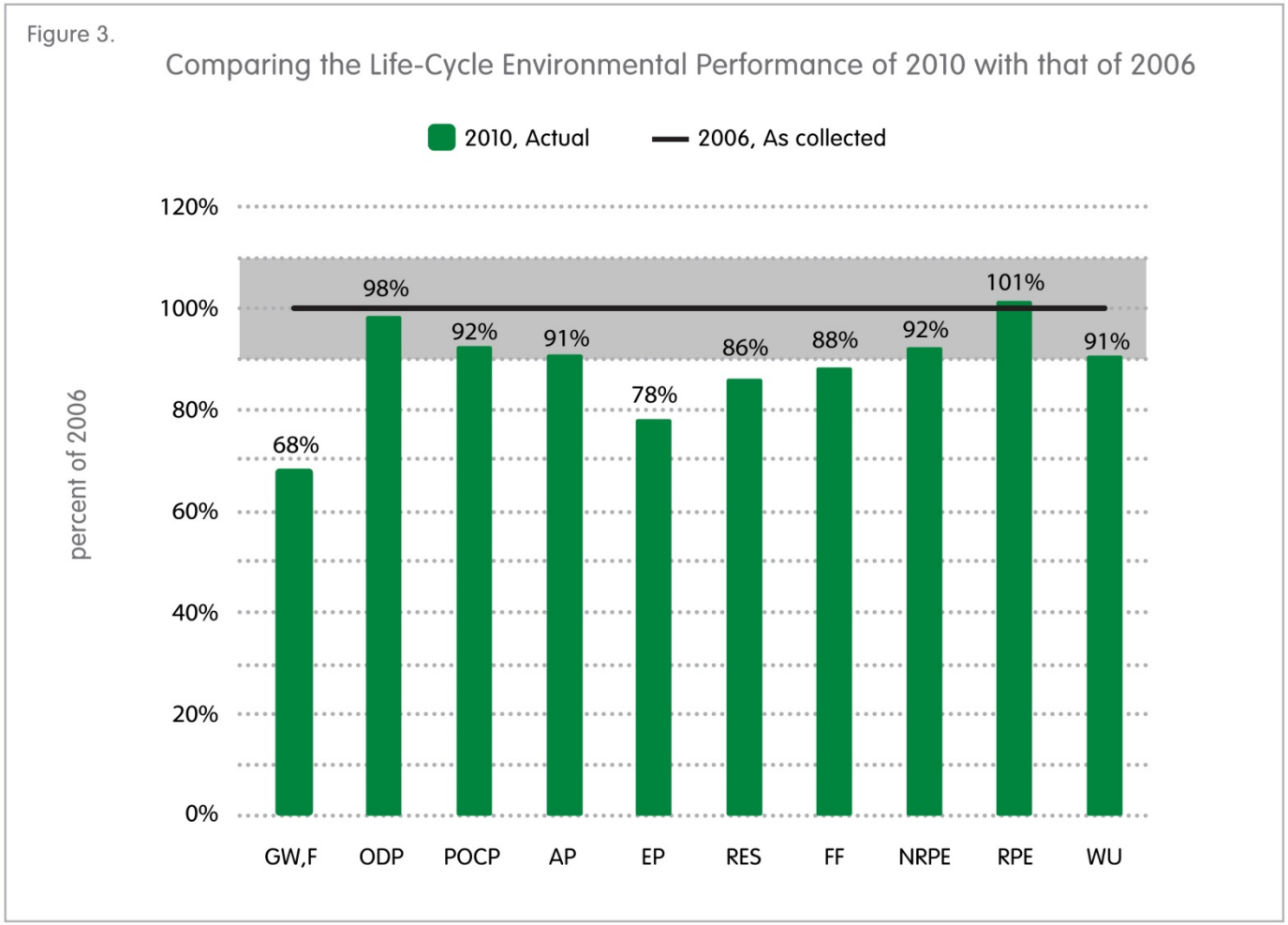
Comparing 2006 vs. 2010 Product



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Actual Results: 2010 vs. 2006

• Global Warming	32% reduction
• Eutrophication	22% reduction
• Respiratory	14% reduction
• Fossil fuel depletion	12% reduction
	- - - - - - - -
• Water Use	9.5% reduction
• Acidification	9% reduction
• Smog	8% reduction
• Non-renewable energy	8% reduction
• Ozone depletion	2% reduction
• Renewable energy	1% increase

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GHG Emissions Reductions

- Global demand for OCC increased
  - -> recovery increased 72% (2006) to 85% (2010)
    - -> reduced methane emissions from landfills
    - -> reduced net CO_2 emissions
- Mills increased combustion of biomass from pulping process versus fossil fuels
  - -> reduced GHG emissions
- Mills and converting switched from oil/coal to natural gas
  - -> reduced GHG emissions

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Key Findings

Industry continues to improve

- Environmental performance significantly improved between 2006 and 2010
- Pulp and papermaking production (containerboard) is main driver of environmental performance
- Converting's (box manufacturing) impact is minor and typically represents less than 20% of the overall impact
- Transportation of containerboard to converting facilities is important for some impact categories
- End-of-Life is only important with respect to global warming indicator results

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Comparison 2

Compare the environmental performance of 2010 industry average product with 100% recycled product produced in 2010.

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Process

- Collect data according to each stream of fiber.
- Isolate energy and other associated manufacturing impacts according to each stream of fiber.
- Determine a <u>methodology</u> for assigning benefits and burdens.

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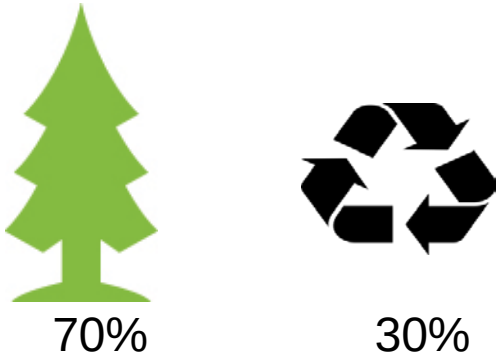
Methodologies

- The Cut-Off Method assigns all environmental burdens and benefits of producing new fiber to that new fiber only .

- The Number-of-Uses Method assigns the burdens and benefits of producing new fiber to both new and recycled fibers based on uses.



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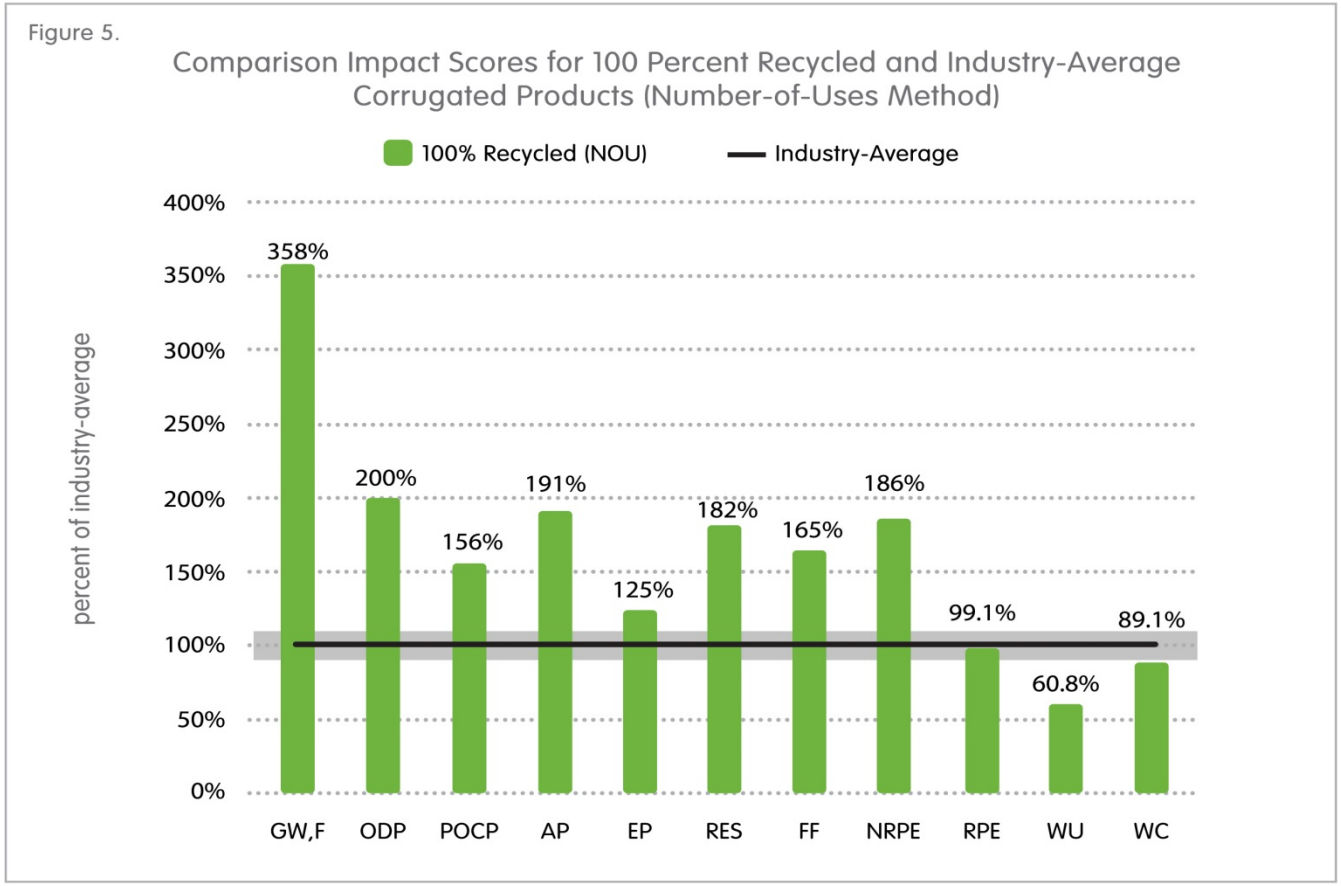
Comparison Impact Scores for 100% Recycled and Industry-Average Corrugated Products (Number-of-Uses Method)



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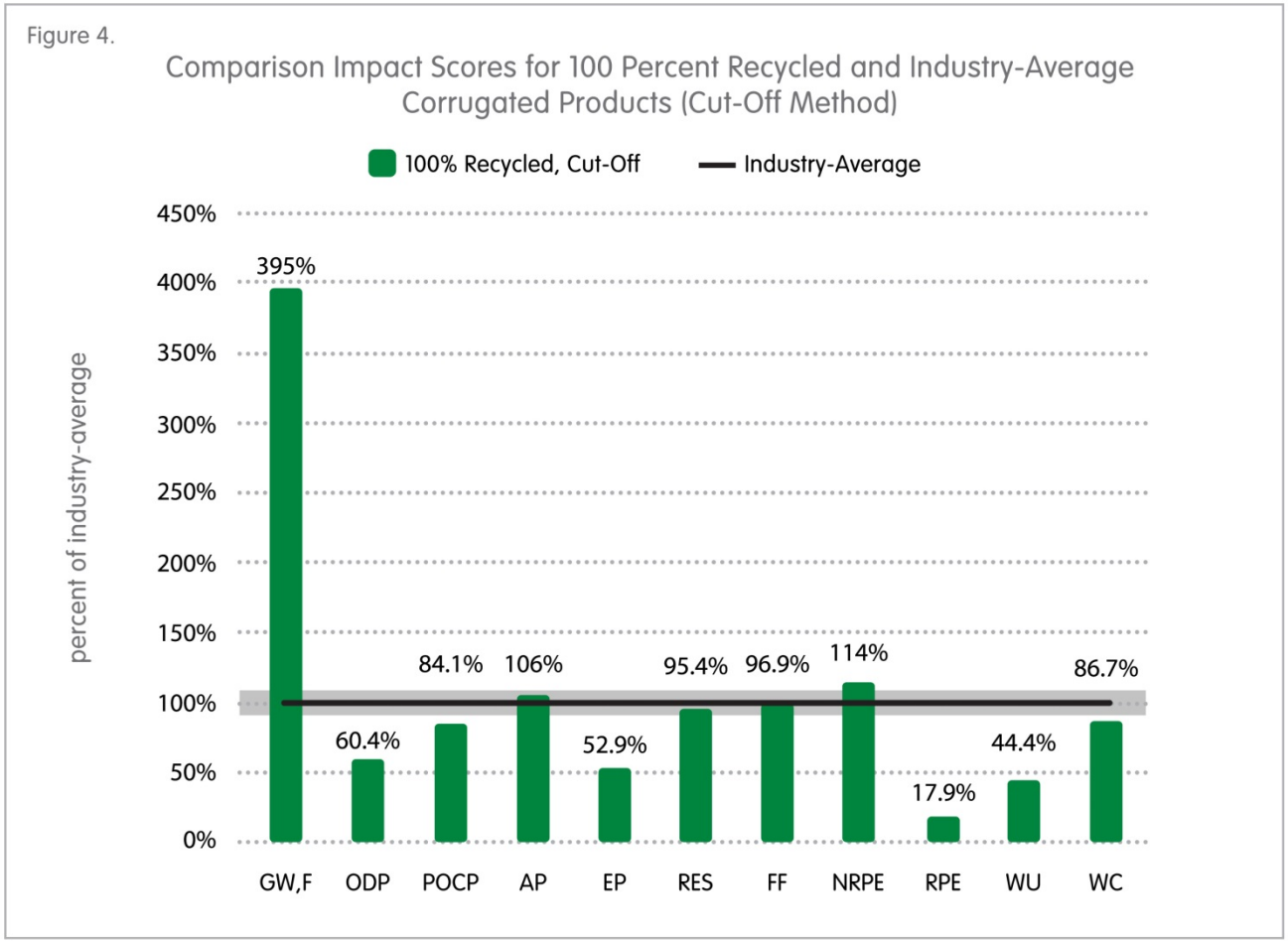
Comparison Impact Scores for 100% Recycled and Industry-Average Corrugated Products (Cut-Off Method)



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Key take-away

The worldwide market needs both new and recycled fibers to produce the best quality product and to ensure a consistent and sustainable supply. Neither system acting alone is viable.

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Communicating the LCA Results

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Communicating the Results

- Study became publically available Wednesday, June 4, 2014
  - Press release distribution
  - Posted to CPA website, www.corrugated.org
- Communications Tools available to members

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Communications Tools

Corrugated Packaging Life Cycle Assessment Summary Report

- 20 page summary report

- Webinar participants receive a copy. Additional copies available through sponsoring associations.

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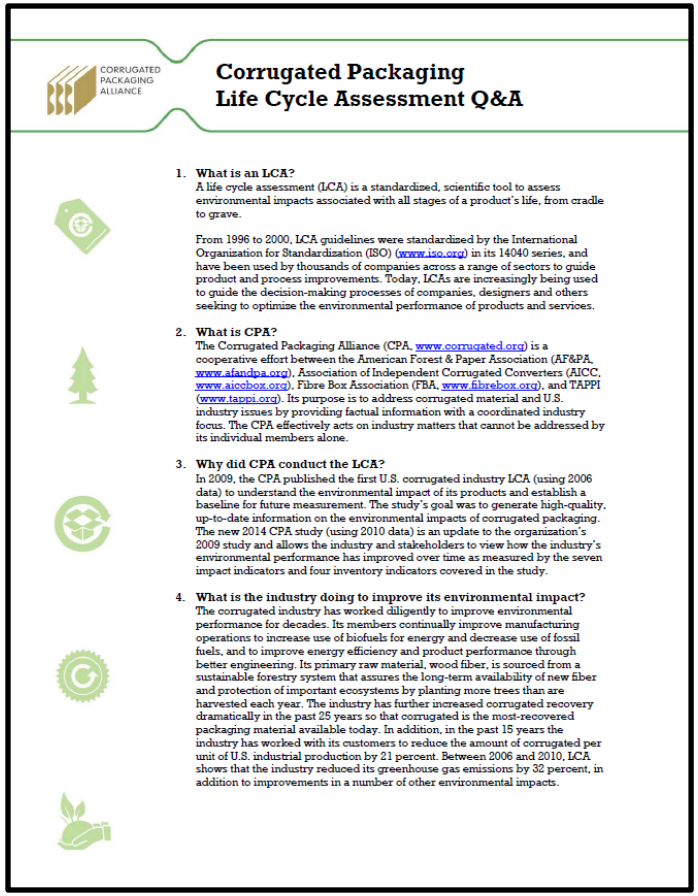
Communications Tools

- Give member companies tools to discuss LCA with their customers, retailers, NGOs, other interested stakeholders
  - PowerPoint Presentation
  - Question and Answer Fact Sheet



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Corrugated Packaging Life Cycle Assessment Q&A

1. **What is an LCA?**
   A life cycle assessment (LCA) is a standardized, scientific tool to assess environmental impacts associated with all stages of a product's life, from cradle to grave.

   From 1996 to 2000, LCA guidelines were standardized by the International Organization for Standardization (ISO) (www.iso.org) in its 14040 series, and have been used by thousands of companies across a range of sectors to guide product and process improvements. Today, LCAs are increasingly being used to guide the decision-making processes of companies, designers and others seeking to optimize the environmental performance of products and services.

2. **What is CPA?**
   The Corrugated Packaging Alliance (CPA, www.corrugated.org) is a cooperative effort between the American Forest & Paper Association (AF&PA, www.afandpa.org), Association of Independent Corrugated Converters (AICC, www.aicobox.org), Fibre Box Association (FBA, www.fibrebox.org), and TAPPI (www.tappi.org). Its purpose is to address corrugated material and U.S. industry issues by providing factual information with a coordinated industry focus. The CPA effectively acts on industry matters that cannot be addressed by its individual members alone.

3. **Why did CPA conduct the LCA?**
   In 2009, the CPA published the first U.S. corrugated industry LCA (using 2006 data) to understand the environmental impact of its products and establish a baseline for future measurement. The study's goal was to generate high-quality, up-to-date information on the environmental impacts of corrugated packaging. The new 2014 CPA study (using 2010 data) is an update to the organization's 2009 study and allows the industry and stakeholders to view how the industry's environmental performance has improved over time as measured by the seven impact indicators and four inventory indicators covered in the study.

4. **What is the industry doing to improve its environmental impact?**
   The corrugated industry has worked diligently to improve environmental performance for decades. Its members continually improve manufacturing operations to increase use of biofuels for energy and decrease use of fossil fuels, and to improve energy efficiency and product performance through better engineering. Its primary raw material, wood fiber, is sourced from a sustainable forestry system that assures the long-term availability of new fiber and protection of important ecosystems by planting more trees than are harvested each year. The industry has further increased corrugated recovery dramatically in the past 25 years so that corrugated is the most-recovered packaging material available today. In addition, in the past 15 years the industry has worked with its customers to reduce the amount of corrugated per unit of U.S. industrial production by 21 percent. Between 2006 and 2010, LCA shows that the industry reduced its greenhouse gas emissions by 32 percent, in addition to improvements in a number of other environmental impacts.

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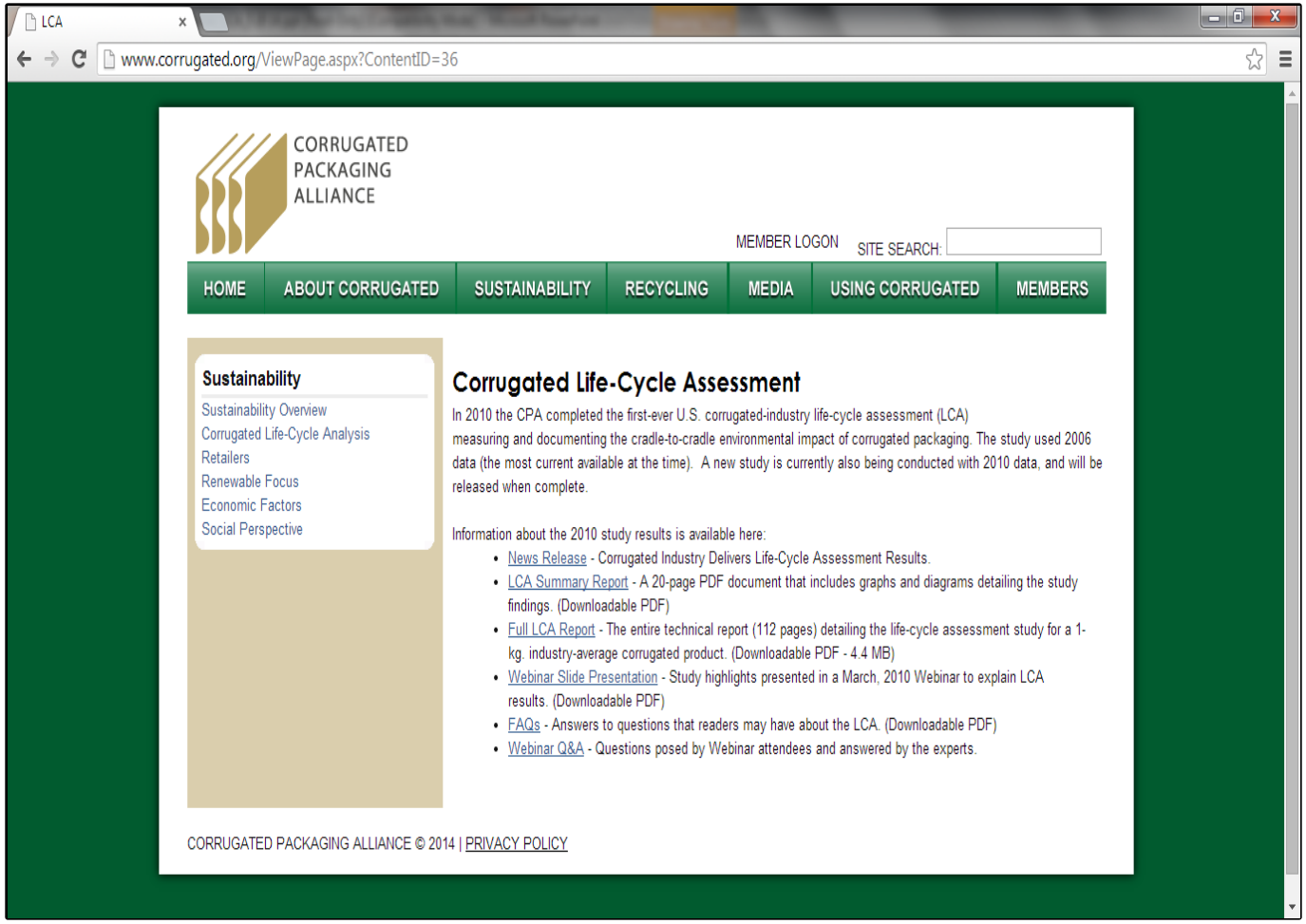
Where can I find these items?



www.corrugated.org

Sustainability Tab

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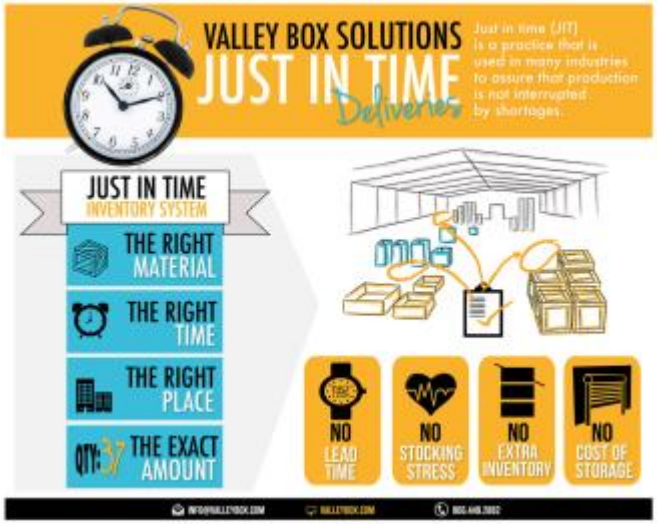
Infographics



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Questions and Answers

To ask a question use the Q&A function in the bottom right-hand corner of your screen.

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Conclusion

- Recommendation: Companies should have a point person to access industry information and determine how it fits company sustainability strategy/story
- To order materials contact Sharlene Huske at shuske@fibrebox.org
- Printed materials to be available in the next couple of weeks

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