



Life Cycle Assessment (LCA) of Corrugated Containers and Reusable Plastic Containers for Produce Transport and Display

FREQUENTLY ASKED QUESTIONS

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.

LCA guidelines are standardized by the International Organization for Standardization (ISO) (www.iso.org) in its 14040 and 14044:2006 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 inform public policy; assist in research and development; and aid in decisions surrounding waste management, biofuels, renewable energy.

2. Why did CPA conduct a comparative LCA?

Commissioned by the Corrugated Packaging Alliance (CPA), the intent of this study is to bring a scientifically robust and transparent environmental assessment of corrugated containers and reusable plastic containers (RPC) to the produce industry and the public. CPA is aware of the difficulties in performing a comparative LCA study and follows expert review procedures in accordance with the provisions of the ISO standard for comparative assertions made public.

3. How were produce commodities selected for the LCA?

The highest volume produce items were selected based on U.S. Department of Agriculture (USDA) data. The container profiles investigated are specific to eight types of produce: apples, carrots, grapes, lettuce (head), oranges, onions, tomatoes and strawberries. As the intent of the study is to capture a snapshot of average U.S. industry operations, only U.S.-grown produce are considered, and seasonal variation is not discretely evaluated.

4. What impact assessment method was used for the study?

TRACI 2.1 was chosen as the primary impact assessment method for this study except for the non-renewable energy indicator. IMPACT2002+v2 was used as a direct assessment of energy use for that indicator. GaBi 8 software was used to perform calculations. Quantis also used ecoinvent for background information like emissions and resource extractions.

5. How does this LCA differ from the 2017 Franklin study?

- The Quantis study compares industry to industry. The Franklin study compares one global supplier of RPCs (IFCO) to the corrugated industry.
- The Quantis study uses industry-weighted data for RPC cleaning processes. The Franklin study uses only IFCO data.
- The Quantis study uses industry-sourced data for RPC turns and loss data. Franklin uses only IFCO data.
- Quantis is a U.S. study. The Franklin study includes all of North America.

- Quantis uses ecoinvent for background information like emissions and resource extraction. ecoinvent is considered by many LCA practitioners to be the most complete and transparent LCI database. Franklin uses USLCI (NREL 2012).
- Quantis uses 2014 energy data for corrugated containers. Franklin uses 2010 energy data for corrugated containers.
- Quantis performed an in-depth analysis of transportation distances using data from the USDA National Agricultural Statistics Service for produce growing regions and shipments. The composite transportation profile was calculated using this information in conjunction with statistics sourced from the Economic Research Service and the U.S. Census.

6. Why can't I compare the environmental impacts favorable to each system?

Each impact category carries a different weight. Comparing the systems by simply adding up the impacts could lead to the wrong conclusions. The reader needs to identify the impact categories that are important to them and select the best system to meet their needs.

7. 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), AICC –The Independent Packaging Association (AICC, www.aiccbox.org), Fibre Box Association (FBA, www.fibrebox.org), and TAPPI (www.tappi.org). Its purpose is to address corrugated material and industry issues by providing factual information with a coordinated industry focus that effectively acts on industry matters that cannot be addressed by its individual members alone.

8. What is Quantis?

Quantis is an independent organization contracted by CPA.

Quantis guides top organizations to define, shape and implement intelligent environmental sustainability solutions. Their team delivers resilient strategies, robust metrics, useful tools, and credible communications. With offices in the US, France, Switzerland, Germany, Italy, and Colombia and clients around the world. Quantis is a key partner in inspiring sustainable change on a global scale. Learn more at www.quantis-intl.com.

9. 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. They have increased corrugated recovery dramatically in the past 25 years so that corrugated is the most-recovered packaging material available today. In addition, the industry has worked with its customers to reduce the amount of corrugated per unit of U.S. industrial production by 12 percent from 2000 to 2017. Between 2006 and 2014, LCA shows that the industry reduced its greenhouse gas emissions by 35 percent, in addition to improvements in other environmental impacts.

10. How can recycling corrugated make a difference?

Old corrugated containers (OCC) become important raw materials for the manufacture of new products when they are recovered for recycling. Increased recovery of OCC, from 72 percent in 2006 to 85 percent in 2014, is the primary reason greenhouse gas emissions declined 35 percent during the same time. Recycling corrugated makes an important difference and improving OCC recovery is

one of the ways the corrugated industry can continue to improve its environmental footprint. OCC is used in a variety of end products, and there is domestic and international demand for it. The great news is, every consumer and user of corrugated packaging can help by participating in this effort.

11. What is carbon sequestration?

Carbon sequestration is absorption and capture of carbon from the atmosphere. Trees absorb carbon from the atmosphere through photosynthesis, as long as they are growing, and store the carbon even after harvest. Burning wood products as fuel releases the same carbon back into the atmosphere that once was captured by trees, resulting in a net zero carbon impact. Recycling results in no carbon releases, since the fiber continues to be used. Landfilling paper and wood products, on the other hand, results in anaerobic decomposition, which produces methane (CH₄) and carbon monoxide (CO) in addition to carbon dioxide (CO₂), contributing much more significantly to global warming. Fortunately, less and less corrugated ends up in landfills as recovery continues to increase, hovering near 90 percent for the past seven years.

12. How do I specify and purchase corrugated packaging to minimize my environmental impact?

The first thing to consider is optimizing the package to protect your product. Packaging represents only 3 percent to 15 percent of a product's total environmental impact. The rest comes from the product itself, so protecting it from damage and premature disposal is very important to the planet.

The corrugated industry has a long history of sustainable manufacturing and design. Your corrugated supplier can help you design a package optimized for performance as well as use of fiber and resources. Performance is critical to protect your products in shipping and prevent incremental waste caused by packaging failure. Source reduction has been practiced within the industry for decades as well, engineering high performance packaging with the least possible amount of fiber material.



To encourage responsible disposal of the used package, consider adding the Corrugated Recycles logo to your corrugated packaging. Resources that encourage recycling, and that you can use to educate your customers on the importance of recycling, are available on corrugated.org.

13. What is float and why isn't it given any values?

Float refers to the quantity of excess RPCs that exist in the total system to ensure availability of supply. These excess RPCs are required to ensure the flexibility to respond to surges in system demand or extended time in the return loop. The size of float has not been released by the RPC industry to determine its size compared to the total RPC system. The production of RPCs used for float has a negative impact on the results for the RPC system; yet, is not included in this study due to lack of information.