

LIFE CYCLE ASSESSMENT OF Common Drink Packaging

PREPARED BY TRAYAK LLC

1. EXECUTIVE SUMMARY

In 2020 the International Bottled Water Association (IBWA) reached out to Trayak LLC to conduct a Life Cycle Assessment of various packaged water formats. The results would be used to update the IBWA's graphic and LCA report. The five formats analyzed within this engagement are industry average: Polyethylene terephthalate (PET) water bottle, PET soda bottle, aluminum can, beverage carton, and a glass bottle. A standard container size of 500 mL was used to establish a reliable functional unit for this comparison.

The IBWA's primary goal is to determine the most sustainable option for packaged water through a third-party verified LCA. These results use industry average data to objectively determine the best packaging formats for water.

After the data was collected for all of the formats, the life cycle impact was calculated using Trayak's Comparative Packaging Assessment (COMPASS) methodology. The packaging systems were analyzed according to seven different environmental impact categories, and a detailed breakdown is provided for fossil fuel usage, GHG emissions, and water usage.

Critical to this engagement was collecting data for all of the packaging formats and establishing a reliable standard structure and packaging system for each. Within the LCA, the materials and processes were able to be modeled with industry average data from ecoinvent 3.5. The end of life of the packaging used specific data for the United States representing the likelihood that each packaging type and material format will be recycled, landfilled, or incinerated based on the current infrastructure.

The LCA results of the comparison between the five industry average water containers shows the PET water bottle as the least environmentally impactful option, and therefore the preferred container for packaged water. It produces the lowest environmental impact across the seven indicators measured, including fossil fuel use, greenhouse gas (GHG) emissions, and water use. The beverage carton was the second least impactful package across many of the seven indicators. The glass bottle was the most environmentally impactful container within this LCA across six of the seven indicators calculated.

Overall, this LCA project provided IBWA members with quantitative data to determine the most sustainable container for packaged water. The LCA shows the preferred container to be the industry average PET 500 mL bottle.