1/5/2011

INTERNATIONAL BOTTLED WATER ASSOCIATION

LIFE CYCLE INVENTORY OF THE U.S. BOTTLED WATER INDUSTRY EXECUTIVE SUMMARY

SUMMARY

The IBWA life cycle inventory (LCI) study evaluated both small pack and home and office delivery (HOD) bottled water production. The study results highlight the environmental footprint of the bottled water industry. The environmentally aware actions of many bottled water companies, such as the use of more recycled PET (rPET) in their bottle production, increasing recycling rates, and enhanced light-weighting, have positively impacted the environmental footprint of the industry.

INTRODUCTION

The International Bottled Water Association (IBWA) commissioned a LCI study to determine the environmental footprint of the United States bottled water industry[1]. The study considered bottled water produced for home and office delivery ("HOD" in reusable bottles from 2.5 to 5 gallons) and small pack bottled water (containers from 8 ounces to 2.5 gallons). Franklin Associates, a division of ERG, produced the LCI and prepared a report that quantified the energy requirements, solid waste generation, and greenhouse gas emissions for the production, packaging, transport, and end of life management for bottled water consumed in the United States in 2007[2].

The results of the LCI demonstrate that the bottled water industry has a considerably small environmental footprint. Moreover, the report provides a benchmark against which the bottled water industry can measure future improvements such as light-weighting and increased bottle recycling.

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[1] Data for this study, including the amounts and types of containers and closure materials, secondary packaging materials, water in the containers, and filling plant energy requirements were derived from surveys completed by IBWA members. Because the results the LCI represent a composite weighted average of the data provided by individual member companies, the results should not be used to represent specific individual brands of bottled water available in the marketplace.

[2] According to a 2008 Beverage Marketing Corporation report, total consumption of bottled water in the U.S. in 2007 was 8.8 billion gallons.

RESULTS

Energy— The IBWA LCI report looked at the BTU (British Thermal Unit) values for fuels and electricity consumed in the production of bottled water. The information is categorized according to six basic energy sources: natural gas, petroleum, coal, nuclear, hydropower, and other (solar, biomass and geothermal energy). Also included in the LCI report are the BTU values for all transportation steps and production of packaging materials, including the energy content of fossil-fuel derived packaging materials.

According to the U.S. Energy Information Administration (EIA), in 2007 the United States consumed 101,553,855 billion (102 quadrillion) BTUs of primary energy as fuels (this is approximately 335.9 million BTU per person).[3] Based on this data, the IBWA LCI report found that:

- The production, packaging, and transportation of the 8,757 million gallons of HOD and small pack bottled water consumed in the U.S. in 2007 required 107.4 trillion BTU[4]. Thus, process and transportation energy use for the bottled water industry was 0.07 percent of total U.S. primary energy consumption reported by EIA.

- Of the 107.4 trillion BTU used in 2007 for bottled water, 102.6 trillion was for small pack water (0.067 percent of the total energy use in the United States in 2007) and 4.8 trillion for HOD water (0.003 percent of the total energy used by the United States in 2007).

Solid Waste— The report examined solid wastes generated from the production, processing, packaging, and transportation of bottled water. The quantities of postconsumer packaging wastes (packaging that is disposed after the bottled water is consumed) were adjusted to account for current recycling levels for plastic, glass, and corrugated packaging.

Americans generated 254 million tons of municipal solid waste (MSW) in 2007, as reported by the U.S. EPA. After recovery for recycling, total MSW discards were 169.2 million tons[5].

- Based on data reported by IBWA members for small pack and HOD water, the total weight of packaging materials used for bottled water packaging in 2007 was 1.64 million tons. After adjusting for recycling of

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[3] http://www.eia.doe.gov/emeu/aer/overview.html, Annual Energy Review, Table 1.3: Primary Energy Consumption by Source, 1949-2008.

[4] Approximately 30 percent of this energy is associated with the energy content of the plastic materials used in bottled water packaging, and the other 75 trillion BTU was consumed as fuels for process and transportation energy

[5] http://www.epa.gov/waste/nonhaz/municipal/pubs/msw07-rpt.pdf.

containers and packaging, the net amount of bottled water packaging disposed of in landfills was 1.08 million tons.

- At 1.08 million tons, bottled water packaging discards account for 0.64 percent of the 169 million tons of total U.S. MSW discards in 2007.

Greenhouse Gas Emissions—Greenhouse gas emissions (GHG) are expressed as CO2 equivalents (CO2 eq).[6]

According to the EIA, total U.S. greenhouse gas emissions in 2007 were 7,947 million tons of CO2 eq.[7] Based on this data, the IBWA LCI report found that:

- The small pack and HOD bottled water industries combined emit 6.8 million tons of CO2 eq a year, which is equivalent to 0.08 percent of total United States emissions.
- The life cycle GHG emissions per half gallon of small pack bottled water are 426.4 grams CO_2 eq., which is 75 percent less CO_2 eq. per half gallon than orange juice (1700 grams of CO2 eq. per half gallon)[8].
- The life cycle carbon footprint for a 500 ml PET bottle of a name brand soft drink is reportedly 240 grams CO_2 eq, and the carbon footprint for 500 ml PET diet soft drink bottle is reportedly 220 grams CO_2 eq.[9]. At 111 g CO_2 eq. per 500 ml equivalent basis, small pack bottled water generates 46 percent less CO_2 eq. when compared to these soft drinks[10].

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[6] To calculate the pounds of CO2 eq, the pounds of emissions of fossil CO2, methane, and nitrous oxide over the life cycle of small pack and HOD bottled water are multiplied by the total global warming potential of each greenhouse gas relative to carbon dioxide's total global warming potential.

[7] ftp://ftp.eia.doe.gov/pub/oiaf/1605/cdrom/pdf/ggrpt/057308.pdf

[8] Data for orange juice based on information at http://www.tropicana.com.pdf/carbonFootprint.pdf

[9] Data for soft drinks based on information at http://cokecorporateresponsibility.co.uk/carbontrust/product-carbon-footprints.html

[10] This assumes that the two calculations methods are comparable.