

2018 Water and Energy Use Benchmarking Study:

Executive Summary



Prepared for:
International Bottled Water Association
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The bottled water industry strongly supports comprehensive natural resource management and environmental stewardship. International Bottled Water Association (IBWA) member companies incorporate water conservation and energy reduction initiatives throughout bottled water production and distribution processes. IBWA has prepared the following benchmarking study to provide an update on the North American¹ bottled water industry's water and energy conservation initiatives and performance, building off [past studies](#).

To establish a robust, consistent data set, each IBWA member was asked to provide five years (2013, 2015, 2017) of facility-specific information, including facility type, total water use, total energy use, total production, and supplementary process information (e.g., type of water treatment, use of refillable bottles). In total, 87 facilities participated in the 2018 study. It is important to note that the 2018 study represents an **amended data set** - facilities are added or removed based on acquisitions/divestitures and new participants in the study. **Please note: the water and energy ratios reported in previous studies have been revised in this report, and should be the referenced historic performance values moving forward.**

The study was managed by Antea® Group, a third-party consultant, who conducted the data collection process, verification, analysis, and reporting.

Key Benchmarking Study Findings

- Participating bottlers represent **over half** of total 2018 United States bottled water production.
- **Water use ratio remained relatively flat** over the study period while total water use and production increased more than 20 percent.
- **Energy use ratio decreased 9 percent** over the study period.
- Bottlers are driving **process efficiencies** that result in water, energy, and cost savings, while **the industry experiences sustainable growth.**

Benchmarking Study Key Definitions

- **Total Water Use** - all water used by the facility, including product water, and water used for facility processes (e.g., treatment, cleaning, maintenance).
- **Total Energy Use** - all energy consumed on site from all sources (e.g., electricity, fuel, steam) used for facility processes
- **Total Production** - the volume of finished product developed at the facility.
- **Water use ratio** - average liters of water used in facility processes (including product water), to produce one liter of bottled water.
- **Energy use ratio** - average amount of total energy consumed on site from all sources (purchased electricity, fuel and steam – measured in mega joules, or MJ) used in facility processes, to produce one liter of bottled water.

¹ United States of America and Canada

The 2018 benchmarking study report presents data and trends from the **73 North American bottled water facilities², representing five IBWA member companies and one industry peer**, that contributed full reporting years (2013, 2015 and 2017) to the study. The study represents 26.9 million kiloliters of bottled water production – **over half (55 percent) of total 2017 United States bottled water consumption³**. Participation levels in this study demonstrate the bottled water industry is committed to better understanding water and energy use, in order to promote more sustainable management of resources.

Energy Use Ratio decreased over 9% from 2013 to 2017, equivalent to an energy avoidance of over 593 million megajoules – enough to power nearly 16,000 single-family homes for a full year*.

**Source: US Energy Information Agency, 2017 Average Annual Energy Usage, Single Family Residence*

Industry Performance

IBWA members were asked to provide data from a five-year period (2013, 2015, and 2017). Figures 1 and 2 present performance data in two ways – a **fixed data set** (column graphs) representing the facilities that provided all years of requested data, and a **dynamic data set** (line graphs) representing all facilities that provided any data over the five years of the study. As seen in Figure 1, water use ratio remained relatively constant over the five-year period from 2013 to 2017, while total water use and total bottled water production increased, indicating the water footprint of facilities remains steady even though demand for product has increased. In Figure 2, while energy use and total bottled water production increased from 2013 to 2017, energy use ratio decreased 9 percent over the same period. **Although an increase in production may require more water and energy use, facilities are taking steps to optimize resource use to avoid waste.** These trends in water and energy use performance demonstrate investments in efficiency measures and process improvements, coupled with improved data tracking by facilities, can lead to positive results in water, energy, and cost savings, while the industry experiences sustainable growth.



Quantifying Mega Joules

It takes approximately **3.6 mega joules** of energy to power a 100 watt light bulb for 10 hours.

Figure 1:

Industry Water Use Ratio Performance
Fixed vs. Dynamic Data Set

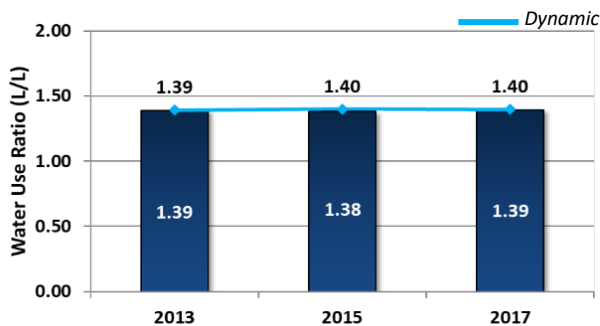
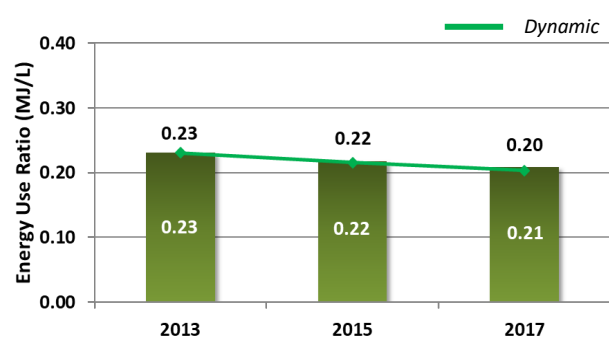


Figure 2:

Industry Energy Use Ratio Performance
Fixed vs. Dynamic Data Set



² Based on a fixed data set of facilities providing all three years of data, versus 87 total participating facilities.

³ "Bottled Water in the U.S. Through 2022"; Beverage Marketing Corporation, August 2018.

The 2017 fixed water use ratio for North American bottled water facilities was 1.39 L/L, and the 2017 fixed energy use ratio for North American bottled water facilities was 0.21 MJ/L. These ratios demonstrate a higher level of performance when compared to the global 2015 averages for bottled water facilities⁴ (1.70 L/L water use ratio, 0.26 MJ/L energy use ratio).

In general, bottled water facilities have the lowest water use ratio and energy use ratio when compared to other beverage sectors. In comparison, other beverage sectors⁵ such as carbonated soft drink bottling and beer production average have larger water and energy use ratios driven by higher intensity processes unique to these other beverages, such as flavor mixing, blending, carbonation, fermentation, cooking, distilling, etc.

Water use ratio varies in magnitude when compared across “types” of bottled water. In 2017, approximately 78 percent of participant facilities indicated that Other⁶ water is their primary bottled product. This mix remained relatively constant throughout the five-year study period – Other water accounts for 60 percent of total bottled water production. As seen in Table 1, Other water bottlers reported an overall higher water use ratio than Spring water bottlers, as expected by the processes related to Other water production that may not be as prevalent in Spring water production (e.g., purification processes / reverse osmosis, startup/run time associated with product changeover, etc.). The water use ratio trend for Other water bottlers are likely influencing the overall industry water use trend; additional evaluation into specific process drivers to further explain these trends will be considered in future studies.

Table 1: Spring vs. Other Water and Energy Use Ratios, 2013 – 2017

| | 2013 | 2015 | 2017 |
|-------------------------|------|------|------|
| Water Use Ratio | | | |
| Spring Water | 1.32 | 1.32 | 1.29 |
| Other Water | 1.43 | 1.40 | 1.45 |
| Energy Use Ratio | | | |
| Spring Water | 0.24 | 0.22 | 0.20 |
| Other Water | 0.23 | 0.22 | 0.22 |

Information in the 2018 study supersedes the ratios and trends reported in previous studies. Benchmarking studies are meant to be a snapshot in time of the current industry status, and as such, we allow our members to review previously submitted data and make amendments based on their most recent understanding of data – both historic and current. The amended data set captured in the 2018 study accounts for industry changes like acquisitions and divestitures, amendments to previously-reported data, and new members providing study data.

⁴ Beverage Industry Environmental Roundtable, 2016. Note that the 2018 BIER Benchmarking Study will not be released until 2019; therefore, global 2015 averages were used for comparison.

⁵ Beverage Industry Environmental Roundtable, 2016.

⁶ For the purposes of this study, Other waters are defined as: *all bottled waters other than mineral and spring water, with or without the addition of minerals for taste. Includes purified water (produced by distillation, deionization, reverse osmosis, or other processes), sparkling bottled water, or well water.*

Facility-based Results

The study also evaluated water and energy use ratio trends among the three bottled water facility types:

- **Small Pack:** facilities that package bottled water in containers from 8 ounces to 2.5 gallons
- **Home and Office Delivery:** facilities that package bottled water in reusable/refillable containers from 2.5 to 5 gallons
- **Mixed Packaging:** facilities with both Small Pack and Home and Office Delivery packaging

As seen in Table 2, water use ratios for each facility type varied over the study period, decreasing from 2013 to 2017 in both Small Pack and Home & Office Delivery. As seen in Table 3, energy use ratios decreased in both Small Pack and Home & Office Delivery, while Mixed Packaging remained consistent from 2013 to 2017. The differences in ratio magnitude among the three facility types are largely process-driven, for example:

- Home and Office Delivery facilities bottle finished product in refillable containers, resulting in additional water use for sanitization processes that do not exist at facilities that use single fill packaging (e.g., most North American Small Pack facilities).
- Some Small Pack facilities have bottle blow molding operations on site, resulting in additional energy use that does not exist at facilities that use off-site blow molding operations to supply bottles (e.g., no Home and Office Delivery facilities in this study operated on site blow molding operations).

Industry Stewardship Efforts

The North American bottled water industry has worked to improve environmental stewardship in several ways. By improving data management and analysis at the facility level, bottlers can track and report their achievements in water and energy conservation. Understanding data to realize where there are opportunities to improve allows for active implementation of process changes to reduce water and energy use while still experiencing sustainable business growth. Participants in the study were asked to provide examples of their environmental stewardship efforts. **Water stewardship efforts include, but are not limited to:** improving performance in the reverse osmosis process; integrating concentrate recovery; optimizing washer units to maximize efficiency; improving data collection; and resolving system leaks. **Energy efficiency measures and initiatives include, but are not limited to:**

To learn more about water stewardship opportunities for bottlers, please visit the IBWA website and download the [Best Practices Framework Guidance](#).

Table 2: Water Use Ratio Performance by Facility Type (L/L), 2013 – 2017

| | 2013 | 2015 | 2017 |
|------------------------|-------------|-------------|-------------|
| ALL | 1.39 | 1.38 | 1.39 |
| Small Pack | 1.37 | 1.36 | 1.37 |
| Mixed Packaging | 1.44 | 1.46 | 1.49 |
| Home & Office Delivery | 1.57 | 1.52 | 1.51 |

Note: Ratios represent the fixed data set for all categories.

Table 3: Energy Use Ratio Performance by Facility Type (MJ/L), 2013 – 2017

| | 2013 | 2015 | 2017 |
|------------------------|-------------|-------------|-------------|
| ALL | 0.23 | 0.22 | 0.21 |
| Small Pack | 0.24 | 0.23 | 0.22 |
| Mixed Packaging | 0.20 | 0.20 | 0.20 |
| Home & Office Delivery | 0.12 | 0.11 | 0.10 |

Note: Ratios represent the fixed data set for all categories.

lighting efficiency such as use of natural light or LED; system automation; increased employee engagement; regular inspections and repairs for compressed air and steam systems; energy audits and surveys; and process optimization through scheduling, settings updates, etc.

Conclusion

In this third benchmarking study, IBWA members have continued to demonstrate their commitment to promoting an environmentally responsible and sustainable industry, as evidenced by the exemplary participation in this year's study and impressive list of stewardship initiatives in action at North American bottled water facilities. Water and energy use ratios demonstrated constant or decreasing trends, while production continues to increase across the industry. Bottlers are driving process efficiencies that result in water, energy, and cost savings, while the industry experiences sustainable growth. The results of this study shall serve as a baseline to measure future progress in water and energy use reduction and conservation efforts across the industry.

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