Water accounting manual

for the calculation of HP's fiscal year 2017 water footprint

Purpose of this document

The purpose of this document is to provide additional details on the calculation methodology for the water footprint of HP Inc. (HP) as communicated in HP's Sustainable Impact Report.

References to "the Company" in this document refer to HP Inc. as the operating entity during the November 1, 2016-October 31, 2017 (FY17) reporting period.

Water reporting standards and definitions

Standards

HP's water calculation method is designed to clearly communicate how water is used across the Company's operations, products and supply chain. The method draws on some of the concepts expressed in the globally-recognized corporate water footprint standard developed by the Water Footprint Network (WFN). This standard is described in detail in WFN's The Water Footprint Assessment Manual: Setting the global standard, 2011. The Company's methodology also uses principles derived from generally accepted financial accounting and reporting principles, including relevance, completeness, consistency, transparency and accuracy.

However, HP's method is fundamentally its own because the Company aims to communicate water used to produce energy across the value chain, a concept that the WFN does not emphasize. HP recognizes that, as a result, its water footprint may not be fully comparable with that of other companies at the present time.

HP reports water consumption in cubic meters (m^3).

Definitions – consumption and withdrawal

HP's methodology utilizes definitions provided by the United States Geological Survey:

- **Consumption** – Water that has been permanently removed from the immediate water environment through processes such as evaporation, transpiration or incorporation into products or crops
- **Withdrawal** – Water that has been diverted or withdrawn from a surface water or groundwater source

For all categories of the water footprint except operations, HP reports consumption. For its own direct operations, HP reports all water withdrawn from municipal sources for use in its operations as consumed.

Definitions – direct and indirect

HP's methodology includes two key categories of water consumption – direct and indirect:

- **Direct consumption by HP** – Water consumed in HP's own operations
- **Direct consumption by suppliers** – Water consumed by HP suppliers in their operations
- **Indirect consumption** – Water consumed by activities needed to produce: (1) electricity for HP's operations or those of its suppliers, (2) electricity to power HP's products and (3) paper for use with HP's printing products[1]

Organizational boundaries

HP calculates the water footprint for all sites within its operational control.[2] HP also models the water footprint for the production supply chain and product use phases of its value chain. HP does not model its non-production supply chain at this time. Regarding the product use phase, HP includes in its scope all devices sold by HP in

the reporting year and reports water consumption expected to occur because of future use of products sold in the reporting year or devices owned by HP and operated on behalf of enterprise customers in the reporting year. For the product use category, the reported data should not be interpreted to mean that consumption has already occurred, but that consumption is expected to occur as a result of indirect consumption activities as described above.

Time boundaries

HP accounts for and reports water consumed to produce and use its products shipped within the applicable reporting year on a fiscal year basis: November 1 through October 31. The first year that HP reported its water footprint was in the fiscal year 2013 (FY13) Living Progress Report.

The Company accounts for water consumption at the following points:

- Occurs simultaneously with the activity and is reported in the period when the activity occurred. For example, the water used to generate electricity for HP's sites.
- May have occurred in previous periods but is reported in the current period because it directly affects an activity that occurred in the current period. For example, the water used to produce goods in a previous period that are then purchased by HP to produce a product sold in the current period.
- Is expected to occur in future years because the activities in the reporting year have long-term water consumption impacts. For example, the water that will be used to generate electricity for an HP product that has not yet reached the end consumer. In this case, the consumption is reported in the current period.

Calculation methodology

The tables below provide specific information on data collection and estimation methodologies, including assumptions, for each category of the water footprint.

Direct consumption

Overview

HP reports direct consumption for its own operations and direct consumption for the operations of its suppliers.

- **Operations** – Direct consumption for operations is based on meter readings as well as estimates. Direct water consumption includes municipal water, wastewater from another organization (NeWater), tanker water, rainwater, and well water. Direct use of surface water is insignificant and not included in data reported. "Reused treated sewage treatment plant water" is not included in direct water consumption.
- **Suppliers** – Direct consumption by HP's suppliers is estimated with EIO-LCA modeling.

<table>
<tr><th>Type</th><th>Boundary</th><th>Inputs, methodology and assumptions</th></tr>
<tr><td>Operations</td><td>Facilities within HP's operational control</td><td>
Input data
Input data is based on site meter readings, utility invoices or estimated data using an HP calculated intensity factor.

For estimations, calculations are based on internal analysis of water consumption intensity (liters per square feet) for each region and occupancy status. HP used 2015 intensity factors for 2017 water calculations, which are consistent with the factors used in the prior year. HP directly tracked data from invoices and other documents representing 85% of total water consumption.

Facility types include: (1) Operational (primarily manufacturing[3] and offices) and (2) Vacant. The intensity factor is derived from actual consumption data from comparable sites.

As of 2017, the six regional facility type intensity factor values are:
<table>
<tr><th>Region</th><th>Operational factor</th><th>Vacant factor</th></tr>
<tr><td>AMS</td><td>24.37 L/ft^2</td><td>8.12 L/sq ft</td></tr>
<tr><td>APJ</td><td>23.47 L/ft^2</td><td>7.82 L/sq ft</td></tr>
<tr><td>EMEA</td><td>12.09 L/ft^2</td><td>4.03 L/sq ft</td></tr>
</table>
For estimated data
Direct operations water consumption (L) = Facility area (sq ft) * Regional facility type intensity factor (L/sq ft).

Notes and assumptions
• Reported data is based on water withdrawn from municipal sources for use in HP's operations. Because all discharges and/or evaporation rates are not tracked, all water in direct operations is assumed to be consumed.
• Water used by on-site generators (producing electricity) cannot be separated out from the total. This amount may be double-counted, because the "Indirect Operations Water Consumption" count below also includes on-site electricity generation. However, on-site generation is a relatively small portion of HP's overall electricity mix. The potential double-count means that the Company's water footprint takes a conservative approach.
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Suppliers

Facilities within HP suppliers' operational control

Input data

HP uses an EIO-LCA to estimate water consumption of its suppliers based on the dollar amount HP spends for each sector type. HP uses relevant EIO-LCA factors and updates those based on internal tools that use revenue as a proxy for water consumption to develop HP-specific factors.

As of 2017, the EIO-LCA factor values (and the relative shares from non-power generation activities) are:

- Device manufacturing: 816 m^3/$M (31% from non-power generation)
- Services: 393 m^3/$M (40% from non-power generation)
- Printing: 1610 m^3/$M (78% from non-power generation)

Additional input data includes:

- Revenue by business segment (on a fiscal year basis, derived from Form 10-K)
- EIO-LCA conversion factors, including the ratio of power generation to non-power generation activities
- Internal adjustment factors to convert between withdrawal and consumption

Business segments are mapped to conversion factors as follows:

Company segment	EIO-LCA conversion factor
Personal systems	Device manufacturing
Printing hardware	Printing
Printing suppliers	Device manufacturing
Services, software, investments	Services

Methodology

Direct water from suppliers (m^3) = Revenue by HP business segment ($M) * EIO-LCA conversion factor (m^3/$M) * proportion derived from non-power generation activities (%) * conversion factor for withdrawal to consumption.

Notes and assumptions

- HP assumes the upper bound of consumption for hydropower, as specific data does not exist for withdrawal.
- All segments of HP are accounted for in revenue calculations, excluding the "Eliminations of intersegment net revenue and other" line item.

Indirect consumption

Overview

HP reports indirect water consumption for production of: (1) electricity for HP's operations, (2) electricity for HP's suppliers, (3) electricity to power HP's products and (4) paper for use with HP's products.

- **Operations** – Indirect water consumption for operations is estimated based on total facility energy use.
- **Suppliers** – Indirect water consumption for suppliers is estimated with EIO-LCA modeling.
- **Product Use** – Indirect water consumption for product use is estimated based on electricity consumption derived from the Company's reported Scope 3 greenhouse use.
- **Paper Use** – Indirect water consumption for paper production is estimated using LCA data.

Type	Boundary	Inputs, methodology and assumptions
Operations	Facilities within HP's operational control	**Input data** • Total annual energy consumption (in kWh) for all facilities within its operational control • Water consumption factor Indirect water consumption (m^3) = Total energy consumption (all types) from operations (kWh) * Water consumption factor (m^3/MWh) **Notes and assumptions** • HP makes the assumption that the technology used to generate its purchased electricity consists of a mix of technologies and cooling techniques for each fuel type. HP has taken an average of the different technologies' water consumption factors to calculate this mix. • The mix of electricity HP purchases is in line with the worldwide energy mix captured in the water consumption factor (per IEA data cited below). 2014 worldwide energy fuel mix data supplied by the International Energy Agency (IEA) in "2016 Key World Energy Statistics." • Average water consumption by fuel type data supplied by the National Renewable Energy Laboratory (NREL) in Macknick, et al., "*Operational water consumption and withdrawal factors for electricity generating technologies: A review of existing literature,*" Environmental Research Letters, volume 7, number 4: December 2012. • As of 2017, the water consumption factor value is 4.456 m^3/MWh. • Water consumption for electricity generated from oil combustion is the same as water consumption for electricity generated from natural gas combustion. This assumption is reasonable given that oil is likely converted to electricity in similar ways to natural gas, and because oil represents a small portion of the total fuel in the electricity mix specified by the NREL fuel consumption data.

<table>
<tr>
<td>Suppliers</td>
<td>Facilities within HP suppliers' operational control (does not include non-production suppliers)</td>
<td>
Input data
HP uses an EIO-LCA to estimate water consumption of its suppliers based on the dollar amount the Company spends for each sector type. HP uses relevant EIO-LCA factors and updates those based on internal tools that use revenue as a proxy for water consumption to develop HP-specific factors.

As of 2017, the EIO-LCA factor values (and the relative shares from non-power generation activities) are:
• Device manufacturing: 816 m^3/$M (31% from non-power generation)
• Services: 393 m^3/$M (40% from non-power generation)
• Printing: 1610 m^3/$M (78% from non-power generation)

Additional input data includes:
• Revenue by business segment (on a fiscal year basis, derived from Form 10-K)
• LCA conversion factors, including the ratio of power generation to non-power generation activities
• Internal adjustment factors to convert between withdrawal and consumption

Business segments are mapped to conversion factors as follows:
<table>
<tr><th>Company segment</th><th>EIO-LCA conversion factor</th></tr>
<tr><td>Personal systems</td><td>Device manufacturing</td></tr>
<tr><td>Printing hardware</td><td>Printing</td></tr>
<tr><td>Printing suppliers</td><td>Device manufacturing</td></tr>
<tr><td>Services, software, investments</td><td>Services</td></tr>
</table>
Methodology
Indirect water from suppliers (m^3) = Revenue by business segment ($M) * EIO-LCA conversion factor (m^3/$M) * proportion derived from power generation activities (%) * conversion factor for withdrawal to consumption.

Notes and assumptions
• All segments of HP are accounted for in revenue calculations, excluding the "Eliminations of intersegment net revenue and other" line item.
• HP assumes the upper bound of consumption for hydropower, as specific data does not exist for withdrawal.
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<tr>
<td>Product use</td>
<td>All devices sold by HP in the reporting year, including water consumption expected to occur</td>
<td>
Input data
• Estimate of energy consumption derived from reported Scope 3 greenhouse gas (GHG) emissions from the product use phase, as outlined in the "HP Carbon Accounting Manual for
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</table>

	because of future use of products sold in the reporting year	the Calculation of Greenhouse Gas Emissions" guidance document • Water consumption factor **Methodology** Indirect water from product use (m^3) = Total energy consumption (all types) from product use (MWh) * Water consumption factor (m^3/MWh) **Notes and assumptions** • This calculation excludes purchase and consumption of paper for use with HP's printer products (see "Paper use" section below for the corresponding calculations). • This calculation includes only the electricity used to power HP's products. • The mix of electricity purchased by HP consumers is in line with the worldwide energy mix captured in the water consumption factor. • All material HP product categories are included. Calculations include more than 99% of HP product units shipped each year associated with the following products categories: Personal systems, including HP desktops, notebooks, workstations, displays, digital signage thin clients, tablets/slates, mobile computing devices and all-in-one computers. Calculators, retail point-of-sale units, and personal systems accessories are not considered in the calculation due to the availability of lifecycle information. Printing, including HP LaserJet, Inkjet, PageWide, DesignJet, Indigo, and Scitex printers, PageWide presses, scanners, and Jet Fusion 3D printers. Printer accessories are not considered in the calculation due to the availability of lifecycle information.
Paper use	HP's printer products sold in the reporting year	**Input data** • Quantity of InkJet, DesignJet, LaserJet, Pagewide, Indigo and Scitex printers and PageWide presses sold during the applicable period • Paper use estimates from field data • Paper-water impact factor **Methodology** Indirect water consumption from paper use of products (kg) = [(Total lifetime pages for InkJet printers * quantity of InkJet printers sold in applicable year) + (Total lifetime pages for LaserJet printers * quantity of LaserJet printers sold in applicable year) + (Total lifetime pages for PageWide printers * quantity of PageWide printers sold in applicable year)+ (Total lifetime pages for DesignJet printers * quantity of DesignJet printers sold in applicable year) + (Total lifetime pages for Indigo printers * quantity of Indigo printers sold in applicable year) + (Total lifetime pages for Scitex printers * quantity of Scitex printers sold in applicable year) +(Total lifetime pages for PageWide presses *

quantity of PageWide Presses sold in applicable year)] * (# sheets) * Paper-water impact factor (kg / 500-sheet ream)/1000 (Kg/m^3) /500 (sheets/lifetime pages)

Notes and assumptions

- Total lifetime pages for all printers is derived from field use data and duplex rates (where applicable).
- Calculation is based on 2007 data for printing and writing papers in North America supplied by the American Forest & Paper Association (AFPA) in: "Printing & Writing Papers: Life-Cycle Assessment Summary Report," 2010.
- As of 2016, the paper-water impact factor value is 40.3 kg / 500 sheets.
- HP improved the accuracy of water footprint calculations in 2016 related to printers by incorporating commercial and industrial graphics printing solutions along with new customer use data on observed duplex rates into our methodology.

Method maintenance

Each year, HP considers the way water is used throughout its value chain to confirm that its water calculation methodology captures the key sources of HP's water footprint by operations, suppliers and products. HP also considers the evolution of publicly-available water accounting standards, definitions, methodologies and data to evaluate how these tools can inform the Company's water footprint methodology.

Record retention

In accordance with Section 6.2 of ISO 14064.1, HP has established and maintains procedures for document retention and record-keeping for information relating to the Company's water footprint. These records may be kept on paper, electronically or via other media. In accordance with HP information management procedures, all data used to calculate its water footprint will be retained for a period of seven years from the end of the reporting period.

[1] Product-use electricity consumption and paper use were identified as the most material impacts in the product use phase of the value chain based on HP's Scope 3 greenhouse gas emissions footprint and lifecycle assessment (LCA) data from the American Forest & Paper Association and the Forest Products Association of Canada.

[2] Operational control is defined as sites listed in HP's global real estate database that are owned or leased by HP. It does not include sites owned or leased by HP employees for telecommuting (e.g., residences for telecommuting employees, short-term leased office space (i.e. Regus Sites)). In a limited number of cases, HP leases space to another tenant (e.g. Hewlett Packard Enterprise or a third party). For scenarios where HP Inc. is in control of a site a site and Hewlett Packard Enterprise (HPE) and/or another party is our tenant, HP Inc. is claiming all of the direct water consumption at that site for both HP and HPE/other tenant(s) due to lack of available sub-metering data, leasing arrangements and other mitigating factors. With these scenarios accounting for less than 10% of total square footage of facilities space owned or leased by HP, the need to separate this water consumption is not considered material.

[3] Sites that contain small manufacturing areas are extrapolated with the "operational intensity value" from their respective region. These small manufacturing areas represent an amount of water that is not material and does not warrant the addition of a "manufacturing intensity value" for water extrapolations