

Water accounting manual

for the calculation of HP's water footprint



- Purpose of document
- Water reporting standards and definitions
- Organizational boundaries
- Time boundaries

Calculation methodology

Method maintenance

Record retention

Purpose of document

This document outlines the method to calculate Hewlett-Packard's (HP) water footprint, as defined in the Water reporting standards and definitions section below, and as communicated in [HP's Living Progress Report \(LPR\)](#).

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](#). HP'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 HP 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 (m³).

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- **Withdrawal**-Water that has been diverted or withdrawn from a surface water or groundwater source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 For its own direct operations, HP reports all water withdrawn from municipal sources for use in its operations as consumed.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 consumption**-Water consumed in (1) HP's own operations, or (2) in the operations of HP's suppliers.
- **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 (i.e., it captures the estimated future life of those products), or devices owned by HP and operated on behalf of enterprise customers in the reporting year.

Time boundaries

HP accounts for and reports water consumed to produce and use the HP products shipped within the applicable reporting year on a fiscal year basis: November 1st through October 31st. The first year that HP reported its water footprint in the LPR was in the fiscal year 2013 (FY13) report. However, the actual data used in the calculations is from the previous fiscal year (FY12). HP accounts for water consumption at the following points:

- Occurs simultaneously with the activity (for example, the water used to generate electricity for HP manufacturing sites) and is reported in the period when the activity occurred
- May have occurred in previous periods (for example, the water used to produce goods purchased by HP to produce a product sold in the current period) but is reported in the current period because product sale occurs 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 reported in the current period has not yet occurred, but is expected to occur in the future as a result of the products sold in 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, or by a joint venture in which HP has at least a 50% share. It does not include sites owned or leased by HP employees for telecommuting (e.g., residences for telecommuting employees).

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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
- **Suppliers**-Direct consumption for suppliers is estimated with EIO-LCA modeling.

Type	Boundary	Inputs, methodology and assumptions														
Operations	Facilities within HP's operational control	<p>Input data Input data is based on site meter readings, utility invoices or estimated data using an HP calculated intensity factor.</p> <p>For estimations, calculations are based on internal analysis of water consumption intensity (liters per square feet) for each region and facility type.</p> <p>Facility types include: (1) Operational (primarily data centers and offices), and (2) Vacant. The intensity factor is derived from actual consumption data from comparable sites.</p> <p>As of 2013, the six regional facility type intensity factor values are:</p> <table border="1"> <thead> <tr> <th>Region</th> <th>Operational factor</th> <th>Vacant factor</th> </tr> </thead> <tbody> <tr> <td>AMS</td> <td>25.1 L / ft²</td> <td>8.28 L / ft²</td> </tr> <tr> <td>APJ</td> <td>24.23 L / ft²</td> <td>8.0 L / ft²</td> </tr> <tr> <td>EMEA</td> <td>14.74 L / ft²</td> <td>4.86 L / ft²</td> </tr> </tbody> </table> <p>For estimated data Direct operations water consumption (L) = Facility area (ft.²)* Regional facility type intensity factor (L / ft.²)</p> <p>Notes and assumptions</p> <ul style="list-style-type: none"> • 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, as the "Indirect Operations Water Consumption" count in Section 4.2 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 HP's water footprint takes a conservative approach. 	Region	Operational factor	Vacant factor	AMS	25.1 L / ft ²	8.28 L / ft ²	APJ	24.23 L / ft ²	8.0 L / ft ²	EMEA	14.74 L / ft ²	4.86 L / ft ²		
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Suppliers	Facilities within HP suppliers' operational control	<p>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.</p> <p>As of 2013, the EIO-LCA factor values (and the relative shares from non-power generation activities) are:</p> <ul style="list-style-type: none"> • Device manufacturing: 793 m³ / \$M (with 31% from non-power generation) • Services: 381 m³ / \$M (40%) • Printing: 1565 m³ / \$M (78%) <p>Additional Input data includes:</p> <ul style="list-style-type: none"> • 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 <p>Business segments are mapped to conversion factors as follows:</p> <table border="1"> <thead> <tr> <th>HP segment</th> <th>EIO-LCA conversion factor</th> </tr> </thead> <tbody> <tr> <td>Personal Systems</td> <td>Device manufacturing</td> </tr> <tr> <td>Servers, Storage, Networking</td> <td>Device manufacturing</td> </tr> <tr> <td>Printing Hardware</td> <td>Printing</td> </tr> <tr> <td>Printing Supplies</td> <td>Device manufacturing</td> </tr> <tr> <td>Services</td> <td>Services</td> </tr> <tr> <td>Software, HPFS, Investments</td> <td>Services</td> </tr> </tbody> </table> <p>Methodology Direct water from suppliers (m³) = Revenue by HP business segment (\$M)* EIO-LCA conversion factor (m³ / \$M)* proportion derived from non-power generation activities (%)* conversion factor for withdrawal to consumption.</p> <p>Notes and assumptions</p> <ul style="list-style-type: none"> • All segments of HP are accounted for in revenue calculations, excluding the "Eliminations of inter-segment net revenue and other" line item (which totalled only \$3.18M in 2012). 	HP segment	EIO-LCA conversion factor	Personal Systems	Device manufacturing	Servers, Storage, Networking	Device manufacturing	Printing Hardware	Printing	Printing Supplies	Device manufacturing	Services	Services	Software, HPFS, Investments	Services
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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 HP's reported Scope 3 greenhouse gas (GHG) emissions calculations for the product use phase.
- **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	<p>Input data</p> <ul style="list-style-type: none"> • Total annual energy consumption (in kWh) for all facilities within its operational control • Water consumption factor <p>Indirect water consumption (m³) = Total energy consumption (all types) from operations (kWh)* Water consumption factor (m³ / MWh)</p> <p>Notes and assumptions</p> <ul style="list-style-type: none"> • 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 "cited below"). • 2011 worldwide energy fuel mix data supplied by the International Energy Agency (IEA) in: "World Energy Outlook 2013", November 2013 • Average water consumption by fuel type data supplied by the National Renewable Energy Laboratory (NREL) in: Macknick, et al., "<i>Operational water consumption and withdrawal factors for electricity generating technologies: A review of existing literature</i>", Environmental Research Letters, volume 7, number 4: December 2012. • As of 2013, the water consumption factor value is 4.4 m³ / 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. 														
Suppliers	Facilities within HP suppliers' operational control (does not include non-production suppliers)	<p>Input data</p> <p>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.</p> <p>As of 2013, the EIO-LCA factor values (and the relative shares from non-power generation activities) are:</p> <ul style="list-style-type: none"> • Device manufacturing: 793 m³ / \$M (with 31% from non-power generation) • Services: 381 m³ / \$M (40%) • Printing: 1565 m³ / \$M (78%) <p>Additional Input data includes:</p> <ul style="list-style-type: none"> • 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 <p>Business segments are mapped to conversion factors as follows:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr style="background-color: #444; color: white;"> <th>HP segment</th> <th>EIO-LCA conversion factor</th> </tr> </thead> <tbody> <tr> <td>Personal Systems</td> <td>Device manufacturing</td> </tr> <tr> <td>Servers, Storage, Networking</td> <td>Device manufacturing</td> </tr> <tr> <td>Printing Hardware</td> <td>Printing</td> </tr> <tr> <td>Printing Supplies</td> <td>Device manufacturing</td> </tr> <tr> <td>Services</td> <td>Services</td> </tr> <tr> <td>Software, HPFS, Investments</td> <td>Services</td> </tr> </tbody> </table> <p>Methodology</p> <p>Indirect water from suppliers (m³) = Revenue by business segment (\$M)* EIO-LCA conversion factor (m³ / \$M)* proportion derived from power generation activities (%)* conversion factor for withdrawal to consumption.</p> <p>Notes and assumptions</p> <ul style="list-style-type: none"> • All segments of HP are accounted for in revenue calculations, excluding the "Eliminations of inter-segment net revenue and other" line item (which totalled \$3.18M in 2012). 	HP segment	EIO-LCA conversion factor	Personal Systems	Device manufacturing	Servers, Storage, Networking	Device manufacturing	Printing Hardware	Printing	Printing Supplies	Device manufacturing	Services	Services	Software, HPFS, Investments	Services
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Type	Boundary	Inputs, methodology and assumptions
Product use	All devices sold by HP in the reporting year or devices owned by HP and operated on behalf of enterprise customers in the reporting year	<p>Input data</p> <ul style="list-style-type: none"> • Estimate of energy consumption derived from reported Scope 3 greenhouse gas (GHG) emissions from the product use phase, as outlined in the "Hewlett-Packard Carbon Accounting Manual for the Calculation of Greenhouse Gas Emissions" guidance document • Water consumption factor <p>Methodology</p> <p>Indirect water from product use (m³) = Total energy consumption (all types) from product use (MWh)* Water consumption factor (m³ / MWh)</p> <p>Notes and assumptions</p> <ul style="list-style-type: none"> • 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.
Paper use	HP printer products sold by HP in the reporting year	<p>Input data</p> <ul style="list-style-type: none"> • Quantity of InkJet and LaserJet printers sold during the applicable period • Paper-water impact factor <p>Methodology</p> <p>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) (# sheets)* Paper-water impact factor (kg / 500-sheet ream)] / 1000 (Kg / m³) / 500 (sheets/lifetime pages).</p> <p>Notes and assumptions</p> <ul style="list-style-type: none"> • Total lifetime pages for InkJet printers is derived from LCAs performed by HP which have been certified to the ECMA-370 Eco Declaration. • Total lifetime pages for LaserJet printers is derived from LCAs performed by HP which have been certified to the ECMA-370 Eco Declaration with adjustments made for printer use patterns as understood by HP. • 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 2013, the paper-water impact factor value is 40.3 kg / 500 sheets.

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 HP'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 HP's water footprint. These records may be kept on paper, electronically, or via other media. In accordance with HP's water 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.

