



Case Study: Hewlett-Packard

Managing Chemicals of Concern in Products and the Supply Chain

Hewlett-Packard¹ (HP) was founded by Bill Hewlett and Dave Packard in 1939 and has grown to be one of the world's largest information technology companies, with revenue of \$118.4 billion in 2008 FY.² The company's first product was an audio oscillator—a test instrument for sound engineers. Headquartered in Palo Alto, California, the company has 320,000 employees, and operates in 170 countries, with more than 69% of its revenue deriving from outside the United States.³

HP has three business units: the Personal Systems group—for business and consumer PCs, mobile computing devices and workstations; the Imaging and Printing group—for inkjet, LaserJet, commercial printing, printing supplies, digital photography and entertainment; and, the Technology Solutions group—for business products including servers, storage, EDS, managed services and software.

HP works with over 600 manufacturing and materials suppliers throughout the world to produce the more than 1.3 million print cartridges, 110,000 printers, 75,000 PC systems and 3,500 servers shipped daily. HP's suppliers are located mainly in developing countries. In FY07, the company took the step of publishing a list of its major suppliers, including commodity suppliers, manufacturers, and service providers. This list of 103 major suppliers represents 95% of its procurement worldwide.⁴ HP was the first information technology company to make public its supplier list, in an effort to be more transparent about its business practices.

HP's supply chain configuration follows a direct procurement model; the company procures from its supply chain all items that are part of the finished product, such as raw materials, components and parts. HP has contractual relationships with its 1st tier suppliers, with all terms and conditions spelled out in a contract between the parties. HP's relationships with 2nd, 3rd and higher tier suppliers are indirect, with the expectation that 1st tier suppliers manage 2nd tier suppliers, and so on. With regard to chemical information, 1st tier suppliers are expected to obtain information needed by HP from higher tiers, with the exception

where HP has a direct relationship with a 2nd or 3rd tier supplier.

IDENTIFYING, PRIORITIZING AND EVALUATING MATERIALS OF CONCERN

Beginning in the early 1990's, HP began to set goals to restrict a range of substances for certain uses, such as PBB/PBDE, ozone depleting substances, cadmium, mercury, and lead. HP's timeline for product materials restriction and substitution can be viewed at: http://www.hp.com/hpinfo/abouthp/histnfacts/timeline/hist_40s.html.

These goals are updated annually. HP has succeeded in eliminating many chemicals of concern from their products. However, some of the company's goals have proven difficult to meet because technically and economically viable alternatives are not yet available. This is the case for remaining uses of brominated flame retardants and PVC for computer cables. HP's 2009 materials use goal is to "eliminate remaining uses of BFRs and PVC from new computing products launched in 2009 as technologically feasible alternatives become readily available that will not compromise product performance and will not adversely impact health or the environment."⁵

The requirements for Hewlett-Packard brand products are specified in their General Specification for the Environment (GSE) standard. This standard includes a list of restricted materials, requirements for packaging, and requirements for products to meet the RoHS Directive.⁶ These specifications are for all HP brand products including subassemblies, part, materials, components, batteries and packaging that become part of HP brand products. The GSE is included in supplier contracts as part of standard terms and conditions.

The restricted materials listed in the GSE are mostly regulated chemicals, although some chemicals, such as PVC, have been included because of stakeholder and environmental, health and safety concerns. The GSE is updated annually. HP has formed a team that meets bi-monthly to identify emerging regulations as well as chemicals of



Materials Restricted From HP Products

- Asbestos
- Cd, Hg, Pb in batteries
- Brominated flame retardants (BFRs)—PBBs, PBDEs including DecaBDE
- BFRs including TBBB-A in external case plastic parts of products
- Cadmium *
- Certain azo colorants
- Chlorinated hydrocarbons
- Chlorinated paraffins
- Formaldehyde
- Halogenated diphenyl methanes
- Hexavalent chromium
- Lead *
- Mercury
- Nickel
- Ozone depleting substances
- Perfluorooctane sulfonates *
- PCBs and PCTs
- Polychlorinated naphthalenes
- Polycyclic aromatic hydrocarbons (PAH)
- PVC (in external case or packaging)
- Radioactive substances
- Tributyl and triphenyl tin and tributyl tin oxide

* exemptions apply

concern that may have been identified by stakeholders outside the regulatory process.

HP has added chemicals to the GSE with a future effective date to give suppliers time to comply. For example, the company is planning to add three phthalates to the GSE, which will be restricted as of 2012. These chemicals are likely to be added to an expanded list of restricted chemicals under the EU's RoHS Directive.

Hewlett Packard is working to develop a method to screen chemicals of concern and compare these to alternatives that have been identified. The company wants to ensure that replacement substances have improved environmental and health profiles. This screening process will evaluate both the inherent hazard of these chemicals and potential exposure routes.

TRACKING MATERIALS OF CONCERN AND COMMUNICATION WITH THE SUPPLY CHAIN

HP requires suppliers to provide data on chemicals for many programs including regulatory compliance under the European Union's (EU) REACH⁷ and RoHS Directives, development of

MSDS's, and green certification programs such as EPEAT and Blue Angel. At this point in time, Hewlett Packard does not ask for 100% disclosure of materials composition, but rather, focuses on collecting data on chemicals of concern in parts, components, or products.

Under the EU's REACH Directive, HP must provide information to consumers on the presence of Substances of Very High Concern (SVHC) in specific products. HP's suppliers are required to provide information on the weight in grams of 15 substances listed on the current⁸ Annex XIV candidate list of chemicals⁹. Suppliers are given the option to indicate where the substances are used in the product. These data are consolidated by Hewlett-Packard and used to prepare reports required under Article 33 of REACH.¹⁰

In addition to the Annex XIV chemicals, HP requests information from its suppliers on approximately 240 additional chemicals. This voluntary reporting list was narrowed from the 67/548/EEC (as amended) Annex 1, as well as other chemical regulatory lists that contain substances meeting the SVHC criteria, such as the Stockholm Convention (POP list) and the Rotterdam Convention (PIC list) list. It includes carcinogens; mutagens; reproductive toxins (CMRs); persistent, bioaccumulative and toxic chemicals (PBTs); and endocrine disruptors that HP determined as possibly used in electronics products. Suppliers are not required to report on these chemicals, but many companies do, and these data provide HP with information on where these chemicals are used in their supply chain should they become restricted in the future.

Suppliers must enter the required data on the 15 SVHC chemicals and voluntarily supply data on 240 additional chemicals directly into HP's web-based supplier portal. Suppliers can also opt to send data via a customized form.

The request for voluntary reporting on a larger universe of chemicals has had mixed results. Some suppliers do report on the entire list; some report only on the 15 mandatory SVHC chemicals on the Annex XIV list. Overall, HP interviewees stated that they received more information than they initially anticipated.

Some of HP's 1st tier suppliers have had difficulty getting chemical information from their 2nd and higher tier suppliers, particularly if those suppliers are small. Interviewees noted that some smaller suppliers find REACH requirements challenging to fulfill as they may not have a sophisticated system for data collection and reporting. HP has worked with some of these companies to help them provide the data needed by the company. Cultural and language differences have acted as a barrier to getting chemical data in some cases.

Section 5 of the GSE describes "chemical substance requirements" for suppliers and applies to substances that are currently regulated or under consideration for



regulation. This section was written to allow Hewlett-Packard to collect data from suppliers on a chemical that may be newly recognized as being of concern, including information on health or environmental hazards, requirements for safe use, and packaging or labeling issues.

As an electronics product manufacturer, HP must ensure that its products are in compliance with the EU's Restriction on Hazardous Substances (RoHS) Directive. HP requires its suppliers to provide chemical data, material or component testing upon request. Suppliers must sign a letter of RoHS compliance and submit to HP.

Hewlett-Packard uses what they call an "active verification" process to ensure that suppliers and HP products are in compliance with the requirements of the GSE. There are four levels to verifying compliance:

Level 1—Suppliers must submit a signed letter as verification of RoHS compliance.

Level 2—Based on HP's long standing Supply Chain Social and Environmental Responsibility program¹¹, HP works with suppliers on a corrective action plan to correct deficiencies.

Level 3—Hewlett-Packard reviews information provided by suppliers and asks them to provide additional information such as analytical test results, as needed.

Level 4—Hewlett-Packard business units determine whether to initiate additional analytical testing. HP-initiated testing enables the company to react quickly if a problem arises.

In HP's view, there is a lack of regulatory harmonization across regions and within some countries. Managing the proliferation of variations to existing regulations, such as RoHS, can take considerable effort even when the same set of substances is restricted. Interviewees stated that harmonization of regulations would allow this global company to more efficiently track and conduct regulatory compliance programs, freeing up resources to advance green chemistry and Design for Environment opportunities.

SUPPLY CHAIN COLLABORATION TO IMPROVE ENVIRONMENTAL AND SOCIAL RESPONSIBILITY IN THE ELECTRONICS SECTOR

HP participates actively in the EICC and GeSI, two collaborative efforts to improve environmental and social responsibility throughout the electronics industry supply chain. HP was involved in forming the Electronics Industry Citizenship Coalition in 2004. A major initiative of this group has been to develop the EICC Code of Conduct, create a

self-assessment questionnaire for industry members and implement training for suppliers. The EICC has also conducted joint audits of common suppliers in the electronics sector. GeSI is the Global e-Sustainability Initiative, formed in 2001 to promote sustainable development in the Information and Communications Technology (ICT) sector.¹² HP has worked with GeSI to develop a web-based tool called the Electronics Tool for Accountable Supply Chains (E-TASC) that provides information on best practices and also include the results of the self-assessment questionnaires.¹³

DESIGN TOOLS FOR EVALUATING CHEMICALS OF CONCERN AND DESIGNING GREENER PRODUCTS

In 1992, HP established a Design for Environment (DfE) program to reduce the environmental impact of its products. The three major elements of the DfE program are energy efficiency, materials innovation, and design for recycling. Energy efficiency focuses on reducing the energy used in manufacturing and in product use. Materials innovation is focused on reducing materials use, and using materials with less environmental impact and more value at end of life. Design for recyclability is focused on making products that can be easily upgraded or recycled. Some of HP's product design guidelines are as follows: include environmental stewards on each design team, reduce numbers and types of materials, standardize plastic resins, use molded-in colors and finishes instead of paints, coatings, plating where possible, minimize energy requirements in product use, increase use of recycled materials in packaging, use fewer packing materials, and design for disassembly and recyclability by avoiding glues and adhesives where possible and using common fasteners.¹⁴

HP participated in the development of EPEAT (Electronic Product Environmental Assessment Tool) which is designed to help institutional purchasers compare computers, notebooks and monitors based on environmental attributes. EPEAT provides a clear set of performance criteria to encourage manufacturers to design environmentally sound products. Products are rated Gold, Silver, or Bronze according to three tiers of environmental performance. Many of HP's products have been scored using EPEAT. In addition, many of HP's products qualify for the Energy Star label, a voluntary program administered by the US Environmental Protection Agency.

LESSONS LEARNED

- **Collecting data on chemicals that are of emerging concern is valuable.** By asking suppliers to provide data on 240 additional chemicals that may be of concern in electronics, HP is building a database that can identify where they are used in the supply chain. This will facilitate future efforts by HP to restrict those chemicals, either because of new regulations or a corporate



decision, and to work with suppliers to find safer substitutes.

- **Obtaining chemical information from suppliers remains a challenge.** The difficulty lies in a number of factors, including: language and cultural barriers, difficulty faced by Tier 1 suppliers in getting information from Tier 2 and higher suppliers, supply chain complexity, and unclear requirements for information under regulatory or green procurement programs.
- **Providing an easy-to-use web-based portal for chemical data entry has facilitated data collection.** This system was developed internally by HP and uses the company's SAP/Environmental Health and Safety module to process the data.
- **Training of suppliers can assist in clarifying requirements for data collection.** HP has reached out directly to Tier 2 suppliers to clarify data requirements. In addition, HP has also developed an active verification process and analytic testing protocol to ensure that suppliers are in compliance with the GSE.
- **The patchwork of global chemical regulatory systems is inefficient and detracts from more proactive Design for Environment activities.** In HP's view, there is a lack of regulatory harmonization across regions and within some countries. Managing the proliferation of variations to existing regulations, such as RoHS, can take considerable effort even when the same set of substances is restricted. Interviewees stated that harmonization of regulations would allow this global company to more efficiently track and conduct regulatory compliance programs, freeing up resources to advance green chemistry and Design for Environment opportunities.
- **Green design guidelines and tools are important in implementing goals for greening products.** HP participated in the development of EPEAT, which provides a clear set of performance criteria to encourage manufacturers to design environmentally sound products.
- **Collaboration with other companies in the electronic sector is valuable.** HP's active participation in programs that encourage collaboration to improve environmental

and social responsibility, including EICC and GeSI, has been a valuable means of sharing information and making improvements across the supply chain.

ENDNOTES

- 1 For this research we interviewed three employees of HP from the Imaging and Printing Division.
- 2 <http://www.hp.com/hpinfo/abouthp/>
- 3 http://www.hp.com/hpinfo/newsroom/HP_in_brief_010309.pdf
- 4 http://www.hp.com/hpinfo/globalcitizenship/gcreport/pdf/HP_suppliers_2008_GCR.pdf
- 5 http://www.hp.com/hpinfo/globalcitizenship/environment/goals.html?jumpid=reg_R1002_USEN
- 6 RoHS, or Restriction of Hazardous Substances (2002/95/EC) is an EU Directive restricting the use of hazardous substances in electrical and electric equipment.
- 7 REACH, or Registration, Evaluation, Authorization and Restriction of Chemicals (Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006), is a new European Union law addressing the production and use of chemical substances and their potential impacts on both human health and the environment. REACH replaces numerous EU laws related to chemicals.
- 8 As of June 1, 2009.
- 9 The list can be viewed at http://echa.europa.eu/chem_data/candidate_list_table_en.asp
- 10 See for example http://www.hp.com/hpinfo/globalcitizenship/environment/productdata/reachdesktop-pc.html?jumpid=reg_R1002_USEN
- 11 <http://www.hp.com/hpinfo/globalcitizenship/supplychain/compliance.html>
- 12 http://www.gesi.org/index.php?article_id=43
- 13 http://www.hp.com/hpinfo/globalcitizenship/gcreport/supplychain/collaboration/eicc.html?jumpid=reg_R1002_USEN
- 14 http://www.hp.com/hpinfo/globalcitizenship/environment/productdesign/design.html?jumpid=reg_R1002_USEN

This document is one in a series of five case studies prepared as part of a project assessing strategies for improving management of materials of concern for United Technologies Corporation. For more information or to download the other case studies, visit www.chemicalspolicy.org.

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The Lowell Center for Sustainable Production at the University of Massachusetts Lowell fosters innovative solutions toward a more sustainable world by developing, studying, and promoting environmentally sound systems of production, healthy work environments, and economically viable work organizations. The Chemicals Policy and Science Initiative (CPSI) at the Lowell Center is one of the most prominent academic chemicals policy efforts in the US. Through research, conferences and trainings, CPSI engages diverse constituencies in the discussion of chemicals management issues to encourage more sustainable chemicals policies.