Environmentally Preferable Purchasing

Required

EP Prerequisite 1

Mercury Reduction

Intent

Protect the health of patients, staff and visitors, and reduce disposal costs and liability, by avoiding purchase of mercury-containing equipment and devices and phasing out existing mercury sources.

Health Issues

In 1998, a Memorandum of Understanding between the American Hospital Association and the U.S. EPA set new goals for hospital pollution prevention. One of the top priorities was the virtual elimination of mercury and mercury-containing devices from the hospital purchasing and waste stream. Mercury is a potent neurotoxin. The most sensitive health effect of mercury is an adverse impact on the neurological development of fetuses, infants and children. Low-level prenatal exposure can result in language, memory and attention deficits in children who were exposed in utero. Since the establishment of the MOU, hospitals have substantially reduced the purchase of mercury-containing chemicals and medical devices and found substitutes for many mercury-containing pharmaceuticals. Some hospitals have eliminated mercury purchases completely.

Credit Goals

Equipment and Devices

- Develop a mercury reduction purchasing policy that prohibits purchase of mercury-containing equipment without prior specific approval from the Hazardous Materials Committee (or equivalent).
- Create an inventory identifying all mercury-containing devices and equipment.

  Note: Mercury-containing equipment and devices may include, but are not limited to, the following: MRI equipment, wheel chairs, automated beds, cantor tubes, bed warmers, bougies and thermometers and other medical and laboratory equipment.
- Label any mercury-containing equipment or devices as “contains mercury.”

  Note: Fluorescent lamps are exempt from this labeling and inventory requirement; however, note purchasing criteria for lamps listed below.
- Identify alternatives to mercury-containing clinical devices and other stand-alone medical and/or facilities equipment (excluding fluorescent lamps) and pilot through supply chain or purchasing, in accordance with the protocol for any new purchase. Develop a plan to transition to mercury-free devices with 100% completion in five years (average 20% per year.)
- For dental equipment, install or confirm existence of amalgam separators that capture a minimum 98% of mercury. Ensure Proper disposal of the captured mercury in accordance with GGHC WM Prerequisite 1: Waste Management Plan.

EP Prerequisite 1 continued

Mercury Reduction

Lamps

Develop and implement a lamp purchasing policy covering the following topics:

- Purchase only illuminated exit signs certified by Energy Star®.
- At the end of their useful life, replace standard (e.g. non-pulse start) metal halide lamp assemblies in interior spaces and mercury vapor High Intensity Discharge (HID) lamp assemblies with other, lower mercury lamp types.
- At the end of their useful life, replace current facility lamps with low mercury fluorescent and high pressure sodium lamp assemblies as follows:

Fluorescent Lamp	Criteria
All T-12 lamps	Phase out entirely
Eight-foot T-8 (Standard and High Output)	Maximum 10 mg mercury
Four-foot T-8 (Standard and High Output)	Maximum 3.5 mg mercury
Three-foot T-8	Maximum 6 mg mercury
Two-foot T-8	Maximum 6 mg mercury
U-Bent T-8	Maximum 8 mg mercury
28-watt T-5	Maximum 2.5 mg mercury
24-watt T5HO (High Output)	Maximum 2.5 mg mercury
54-watt T5HO (High Output)	Maximum 2.5 mg mercury
22-watt Circular T-5	Phase out entirely
Compact fluorescent lamps	Maximum 5 mg mercury - Energy Star® qualified, (excluding pin base lamps)
High Pressure Sodium Lamp	**Criteria**
50-watt HPS	Maximum 18 mg mercury
70-150-watt HPS	Maximum 15 mg mercury
200-watt or greater HPS	Maximum 32 mg mercury

- Implement a lamp-recycling program that meets or exceeds the Universal Waste regulations of the respective state.

EP Prerequisite 1 continued

Mercury Reduction

Training

- ❑ Educate and annually update purchasing and department heads on the facility's mercury reduction policy, the process for purchasing mercury-free equipment and devices, and progress with the mercury phase-out plan.

Suggested Documentation

Equipment and Devices

- ❑ Compile documentation of the facility's mercury reduction purchasing policy and annually review progress in accordance with Credit Goals.
- ❑ Compile an inventory identifying all mercury containing devices and equipment and mercury-free alternatives in accordance with Credit Goals. Label any identified mercury-containing equipment or devices as "contains mercury."
- ❑ Compile documentation verifying that amalgam separators able to capture a minimum of 98% mercury are installed on all applicable dental equipment in accordance with Credit Goals.

Lamps

- ❑ Demonstrate that lamp purchasing over a minimum one-year period complies with the Credit Goals, based on documentation for each type of mercury-containing lamp. Document performance of the fluorescent lamp recycling program, including the number and percentage of mercury-containing lamps recycled and final disposition, in accordance with Credit Goals.

Training

- ❑ Document an annual or more frequent training of all relevant employees on proper segregation of mercury until phase-out is complete.

Reference Standards

U.S. Environmental Protection Agency (EPA) Energy Star, http://www.energystar.gov

U.S. Environmental Protection Agency (EPA), Universal Waste Rule, http://www.epa.gov/epaoswer/hazwaste/id/univwast.htm

EP Prerequisite 1 continued

Mercury Reduction

Potential Technologies & Strategies

- ***Credit Synergies:*** *Coordinate implementation of this credit with GGHC IO Prerequisite 1: Integrated Operations & Maintenance Process; GGHC FM Prerequisite 2: Minimum Building Energy Efficiency Performance; GGHC FM Credit 1: Optimize Energy Efficiency Performance; GGHC CM Prerequisite 2: Chemical Management Policy and Audit; GGHC CM Credit 1: Indoor Chemical Contaminant Prevention; GGHC WM Prerequisite 1: Waste Management Plan; GGHC WM Prerequisite 2: Waste Generation Profile and Measurement; GGHC WM Prerequisite 3: Solid Waste Land Disposal; GGHC WM Credit 1: Solid Waste and Material Management; GGHC WM Credit 2: Regulated Medical Waste Reduction; GGHC EP Prerequisite 2: Electronic Assets Environmental Management Plan; GGHC EP Credit 1: Solid Waste Prevention in Purchasing; GGHC EP Credit 2: Toxicity Prevention in Purchasing; GGHC EP Credit 3.1-3.5: Toxic Chemical Reduction: Facility Alterations & Additions; GGHC EP Credit 3.6: Toxic Chemical Reduction: Furniture & Medical Furnishings; GGHC EP Credit 5: Electronics Purchasing & End of Life Management.*
- Develop a mercury management policy for proper management of mercury-containing devices until the facility is mercury-free. Maintain the policy and training even after the site is designated “mercury-free.”
- Conduct a community-wide thermometer exchange to encourage the public to return mercury-containing devices for proper recycling and disposal in return for a mercury-free thermometer.
- Purchase low-mercury fluorescent lamp assemblies. Advances in lighting and ballast technology have greatly reduced the per bulb mercury concentrations. Low-mercury, high intensity discharge lamps are increasingly available. Consider long-life bulbs to reduce costs associated with relamping, recycling and purchase.
- Consider piloting the use of mercury-free LED (light-emitting diode) lamps or very low mercury fluorescent induction lighting, with instant on–off control, offering reduced energy usage and long life.
- Avoid bulb crushers (even if legal in a certain state) as they can expose workers to mercury vapor and increase hazardous waste generation (crushed bulbs are not classified as universal waste).
- Develop a mercury spill response policy that meets the intent of the U.S. EPA Resource Conservation and Recovery Act (RCRA), including: spill cleanup supplies, and staffers trained in spill response, including removal by a licensed hazardous waste hauler. Ensure proper oversight of spill cleanup. Report the spill to Joint Commission and other applicable regulatory bodies and replenish spill supplies. (See GGHC CM Credit 1.1: Community Contaminant Prevention: Leaks & Spills.)
- Collect, store and dispose all mercury-containing devices as Universal Waste, per Universal Waste guidelines. (See GGHC CM Credit 2: Indoor Chemical Contaminant Prevention.)
- Review the Practice Greenhealth Making Medicine Mercury Free Award criteria for a review of mercury sources, http://www.practicegreenhealth.org.

EP Prerequisite 1 continued

Mercury Reduction

Resources

The American Hospital Association (AHA) and the United States Environmental Protection Agency (EPA) signed a Memorandum of Understanding identifying goals to reduce the impact of health care facilities on the environment. http://www.practicegreenhealth.org.

Health Care Guide to Pollution Prevention Implementation through Environmental Management Systems (U.S. EPA 2005 draft), http://www.kppc.org/EMS/

Medical, Academic and Scientific Community Organization (MASCO), Boston, MA: Mercury Work Group, http://www.masco.org/mercury/

Minnesota Technical Assistance Program Mercury Page, http://mntap.umn.edu/health/mercury.htm

NY Academy of Science "What You Should Know about the Health Risks of Mercury," The report discusses major sources of mercury and methylmercury to the Harbor (and health care's role). http://www.nyas.org/about/newsDetails.asp?newsID=55&year=2002

Practice Greenhealth, Making Medicine Mercury Free Award criteria, http://www.practicegreenhealth.org.

U.S. Environmental Protection Agency (EPA), Mercury page and Mercury Study Report to Congress, http://www.epa.gov/mercury/report.htm.

U.S. Environmental Protection Agency (EPA), Resource Conservation and Recovery Act, 1976 (RCRA), http://www.epa.gov/rcraonline/

Many states have enacted laws prohibiting some or all uses of mercury-containing medical devices and/or mercury switches. These include but are not limited to:

- Maine *State law (LD 1159)* prohibiting the sale of mercury in switches, measuring devices (including sphygmomanometers), instruments and thermostats.
- Washington *State law (House Bill 1002)* requiring the labeling of fluorescent lamps that contain mercury. Prohibits the sale of mercury-containing items in products such as thermometers and thermostats. Sphygmomanometers may not be sold with the exception of a hospital or health care facility with a mercury reduction plan in place.
- Michigan State law (House Bill 4599) bans the sale of mercury thermometers.
- Connecticut *State law (House Bill 5539)* bans the sale and distribution of mercury fever thermometers and places restrictions on the sale of other mercury-containing equipment and devices.
- Massachusetts State law (House Bill 3772) bans the sale of mercury fever thermometers.
- California *State law (SB 633)* restricts the use and distribution of mercury fever thermometers and other mercury-containing equipment and devices.
- Oregon *State law (HB 3007)* phases out mercury thermostats and prohibits the sale of mercury-containing fever thermometers and other mercury-containing equipment and devices.

Required

EP Prerequisite 2

Electronic Assets Environmental Management Plan

Intent:

Reduce the environmental and health burdens associated with the manufacture, use and disposal of electronic products.

Health Issues

The electronics industry—nationally and internationally—is making strides to reduce toxic chemical use in their products, though there is still progress to be made regarding environmental considerations, recycling or end-of-life disposal. Computers and other electronic wastes can contain toxic chemicals. The average electronic product contains chemicals that are persistent, bioaccumulative toxicants, teratogens, carcinogens, reproductive toxicants, endocrine disruptors, and/or mutagens, including heavy metals such as lead and cadmium in Cathode Ray Tube (CRT) monitors, mercury in Liquid Crystal Display (LCD) and flat panel monitors, and halogenated flame retardants in circuit boards and plastic housings. Workers in manufacturing facilities may be exposed to these toxic substances, and users may be exposed to the toxic chemicals during the products' use.

The increased promotion of new IT equipment and design for short life spans, has made electronic waste one of the world's fastest growing waste streams. According to the U.S. EPA, fifteen to twenty percent of discarded electronics are currently recycled,[1] with the remainder stockpiled or improperly disposed of in landfills or incinerators. Many electronics are exported to developing countries for disassembly, sometimes under unsafe conditions. Additionally, through burning of halogenated plastics in cable wiring, melting of lead solder in circuit boards and leaching of persistent chemicals from waste stockpiles, toxic chemicals can be released into air, land, and water, directly exposing recycling workers and adjacent communities to these hazards, and threatening the global public and ecological health.

Credit Goals

- Develop an Electronic Assets Management Plan by either of the following methods:
  - Establish and maintain an Electronic Assets Management Team with staff from the Information Technology (IT) or electronics department, Biomedical Engineering, Environmental Services/Recycling, Procurement, Administration and Risk Officers; or,
  - Work directly with an existing "green" team (a group tasked with addressing sustainability issues) on Electronic Assets Management and include people from relevant departments associated with the lifecycle of these products.
- Develop and implement an Electronic Assets Environmental Management Plan that includes a total cost of ownership approach with strategies around Procurement, Reduction, Use-Phase Management, Responsible Reuse, and Responsible Recycling.
- At the point of purchase for equipment, require manufacturers' or vendors' written commitments to equipment end-of-life management through to final disposition, including: take-back, refurbishment, resale, responsible donation or recycling, and provision of asset tracking by serial number.
- Establish a process for tracking responsible end-of-life management for existing or inherited equipment.

[1] U.S. Environmental Protection Agency (EPA), General Information on E-Waste, http://www.epa.gov/eCycling/faq.htm#recycled

EP Prerequisite 2 continued

Electronic Assets Environmental Management Plan

- Establish and maintain a HIPAA (Health Insurance Portability and Accountability Act) compliance plan for all electronic products to safeguard the privacy of personal information.

Note: All of the above strategies should be pursued in accordance with applicable federal and state solid waste and hazardous waste disposal regulations, including Universal Waste Rules.

Suggested Documentation

- ❑ Compile and annually review documentation tracking implementation of the Electronic Assets Environmental Management Plan.
- ❑ Compile and annually review documentation demonstrating compliance with the Electronics Management Plan's Purchasing and End-of-Life Management requirements over a minimum 12-month period. Demonstrate continuous improvement over time.
- ❑ Compile and annually review documentation of the facility's HIPAA (Health Insurance Portability and Accountability Act) compliance plan for electronic products in accordance with regulations.

Reference Standards

HIPAA (Health Insurance Portability and Accountability Act), http://www.hhs.gov/ocr/hipaa/

U.S. Environmental Protection Agency (EPA), Resource Conservation and Recovery Act, 1976 (RCRA), http://www.epa.gov/rcraonline/

U.S. Environmental Protection Agency (EPA), Universal Waste Rule, http://www.epa.gov/epaoswer/hazwaste/id/univwast.htm

Potential Technologies & Strategies

- ***Credit Synergies:*** *Coordinate implementation of this credit with GGHC IO Prerequisite 1: Integrated Operations & Maintenance Process; GGHC FM Prerequisite 2: Minimum Building Energy Efficiency Performance; GGHC FM Credit 1: Optimize Energy Efficiency Performance; GGHC CM Prerequisite 2: Chemical Management Policy and Audit; GGHC CM Credit 1: Indoor Chemical Contaminant Prevention; GGHC WM Prerequisite 1: Waste Management Plan; GGHC WM Prerequisite 2: Waste Generation Profile and Measurement; GGHC WM Prerequisite 3: Solid Waste Land Disposal; GGHC WM Credit 1: Solid Waste and Material Management; GGHC WM Credit 2: Regulated Medical Waste Reduction; GGHC EP Credit 1: Solid Waste Prevention in Purchasing; GGHC EP Credit 2: Toxicity Prevention in Purchasing; GGHC EP Credit 3.1-3.5: Toxic Chemical Reduction: Facility Alterations & Additions; GGHC EP Credit 3.6: Toxic Chemical Reduction: Furniture & Medical Furnishings; GGHC EP Credit 5: Electronics Purchasing & End of Life Management.*
- Require suppliers to deliver all printers and copiers set for double-sided (duplex) copying/printing.
- Purchase Energy Star products for all relevant categories and require suppliers to deliver all applicable equipment with energy saving settings enabled.

EP Prerequisite 2 continued

Electronic Assets Environmental Management Plan

- Prefer products that are durable, long lasting, reusable or refillable, whenever feasible. Extend Information Technology (IT) products' life by upgrading memory, processor speed or other attributes instead of disposing of them.
- Purchase rechargeable batteries where applicable and return rechargeable batteries at the end of their useful life for recycling,
- Assess the appropriateness of multifunction devices that combine a printer, fax, scanner and/or copier into one package for your uses. These machines consume less energy by using one printer engine for multiple functions.
- Require vendors to eliminate packaging, take it back for reuse, or use the minimum amount necessary for product protection, to the greatest extent practicable. Packaging that is reusable, recyclable or compostable should be preferred, when suitable uses and programs exist.
- Give preference to equipment that is made with recycled content.
- For printers, copiers, fax machines and multifunction devices, establish procedures and policies that give priority to remanufacturing expended toner cartridges. Return used toner cartridges for remanufacturing and reuse. Purchase cartridges tested by a remanufacturer who will recycle the parts removed from spent cartridges, and whose replacement parts contain recycled content.

Resources

Basel Action Network (BAN) is a non-profit organization focused on confronting the global environmental injustice and economic inefficiency of toxic trade (toxic wastes, products and technologies) and its devastating impacts, while promoting green, toxic free and democratic design of consumer products. http://www.ban.org/

Electronics Take Back Coalition, General information about the environmental and human health problems associated with the lifecycle of electronic products, http://www.computertakeback.com/

Electronic Product Environmental Assessment Tool (EPEAT) is a system to help purchasers in the public and private sectors evaluate, compare and select desktop computers, notebooks and monitors based on their environmental attributes. EPEAT also provides a clear and consistent set of performance criteria for the design of products, and provides an opportunity for manufacturers to secure market recognition for efforts to reduce the environmental impact of its products, http://www.epeat.net/

Health Care Without Harm, (HCWH) is a non-profit international coalition dedicated to transform the global health care sector to be ecologically sustainable, and provides information on the purchase, management and disposal of environmentally preferable electronic equipment, visit http://www.noharm.org/us/electronics/issue.

U.S. Environmental Protection Agency (EPA) Electronics Environmentally Preferable Purchasing page (specifications, case studies), http://www.epa.gov/epp/pubs/products/electronic.htm.

1 point

EP Credit 1

Solid Waste Reduction in Purchasing

Intent

Reduce generation of municipal solid waste through waste prevention at the point of purchase.

Health Issues

U.S. hospitals generate approximately 6,600 tons of waste per day, with non-hazardous solid waste representing up to 80% of the total. According to zero-waste policy experts, approximately 90% of solid waste can be recycled, composted, or otherwise diverted from landfill or incineration based on current technologies and infrastructure. Waste reduction conserves natural resources and reduces greenhouse gas emissions by reducing demand for virgin materials and the amount of waste sent to landfills and incinerators that can result in greenhouse gas emissions such as methane—a potent greenhouse gas. The 1998 Memorandum of Understanding between the American Hospital Association and the Environmental Protection Agency calls on hospitals to voluntarily reduce their waste generation by 50%. Waste prevention conserves natural resources, transport of waste materials to landfills and treatment facilities each with associated emissions. Purchasing departments have a key role to play in reducing a facility's waste generation through purchasing practices that avoid potential for future waste streams by eliminating waste at the source.

Credit Goals

- Develop and implement a process and establish policy language for investigating waste reduction opportunities in the supply chain purchasing process for products and services.
- Phase in waste reduction criteria into contracts and specifications for products and services at the point of development and renegotiation. Waste reduction criteria extend the life of a product through maintenance, reduced packaging, take back programs, leasing, switching from disposable to reusable or a change in process or preference to products for which markets exist and are readily recyclable or able to be reprocessed.
- Annually educate department heads, purchasing personnel and their group purchasing organization (where appropriate) on the value of and opportunities for waste reduction.
- Establish and maintain an EPP subcommittee (or equivalent decision-making body) reporting directly to the facility-wide environmental stewardship committee focused on reducing waste in the supply chain. Integrate the subcommittee's work into the Integrated Operations & Maintenance Process outlined in GGHC IO Prerequisite 1: Integrated Operations & Maintenance Process.

EP Credit 1 continued

Solid Waste Reduction in Purchasing

Suggested Documentation

- ❑ Maintain and annually review an environmentally preferable product purchasing policy incorporating waste reduction language in accordance with Credit Goals.
- ❑ Track and annually review progress in adding waste reduction criteria to contracts as they are developed and renegotiated. Maintain and annually review documentation of trainings in accordance with Credit Goals including sign in sheets, educational information and length of training.
- ❑ Compile EPP subcommittee (or equivalent decision-making body) meeting minutes and other documentation identifying waste prevention opportunities over the previous 12-month period through purchasing decisions.

Reference Standards

There are no reference standards for this credit.

Potential Technologies & Strategies

- ***Credit Synergies:*** *Coordinate implementation of this credit with GGHC IO Prerequisite 1: Integrated Operations & Maintenance Process; GGHC CM Prerequisite 2: Chemical Management Policy and Audit; GGHC CM Credit 1: Indoor Chemical Contaminant Prevention; GGHC WM Prerequisite 1: Waste Management Plan; GGHC WM Prerequisite 2: Waste Generation Profile and Measurement; GGHC WM Prerequisite 3: Solid Waste Land Disposal; GGHC WM Credit 1: Solid Waste and Material Management; GGHC WM Credit 2: Regulated Medical Waste Reduction; GGHC EP Prerequisite 2: Electronic Assets Environmental Management Plan; GGHC EP Credit 2: Toxicity Prevention in Purchasing; GGHC EP Credit 3.1-3.5: Toxic Chemical Reduction: Facility Alterations & Additions; GGHC EP Credit 3.6: Toxic Chemical Reduction: Furniture & Medical Furnishings; GGHC EP Credit 5: Electronics Purchasing & End of Life Management; GGHC EP Credit 6: Office Supplies.*
- Collaborate with group purchasing organizations (GPO) and manufacturers to identify opportunities to reduce waste in their product or service offerings.
- Conduct a life cycle cost analysis when evaluating disposable versus reusable products to ensure that waste disposal fees, labor, storage and other criteria are addressed.
- Consider investing in reusable options for the following high use items to reduce waste:
  - Toters for material delivery from receiving/storeroom to user areas.
  - Linens including underpads (chux), pillows, isolation gowns, barrier protection, surgical drapes, stainless sterilization containers (versus blue wrap), lab coats and linen bags.
  - Mattresses—eliminate disposable “eggcrate” foam mattresses.
  - Food service ware in accordance with GGHC FS Credit 4: Reusable and Non-Reusable Products. (Note: Consider biodegradable disposable food service ware for take-out.)

EP Credit 1 continued

Solid Waste Reduction in Purchasing

  - Shipping containers for regulated medical waste removal.
  - Sharps containers for sharps management.
  - Medical devices, including instruments.
- Require take back of shipping crates and pallets in contract language with manufacturers and/or distributors.
- Require take back or leasing programs for televisions, copiers, computers, telephones and medical equipment in contract language with manufacturers and/or distributors.
- Institute a paper prevention initiative, including review of all printed reports and opportunities for distribution sharing and printing of departmental-specific pages only. Purchase or lease printers, scanners and copiers with automatic double-sided copying capabilities.
- Review purchasing policies and establish high-percentage post-consumer recycled content and increased recyclability in product or packaging if not in place. For example, request recycled paper packaging instead of foam plastic packaging and containers made from plastics #1 and #2, to increase potential for recycling when a reusable option is unavailable.
- Review packaging and shipping materials to identify materials used and reduction opportunities.
- Establish a program to divert furniture and supplies from the waste stream through donation, refurbish or recycling.
- Research regional recycling and reuse markets to maximize waste reduction opportunities.

Resources

Health Care Without Harm's Chemical Policy Page: http://noharm.org/us/chemicalpolicy/issue

Health Care Without Harm's Green Purchasing Page: http://noharm.org/us/greenPurchasing/issue

Practice Greenhealth, Environmentally Preferable Purchasing (EPP), http://www.practicegreenhealth.org

New York City Wasteless Program,
http://www.nyc.gov/html/nycwasteless/html/in_business/tips_business_office.shtml

U.S. Environmental Protection Agency (EPA) Waste Prevention,
http://www.epa.gov/epaoswer/osw/pubs/source_reduction.htm

U.S. Environmental Protection Agency (EPA) Comprehensive Procurement Guidelines,
http://www.epa.gov/cpg/products.htm.

U.S. Environmental Protection Agency (EPA) Green cafeteria program,
http://www.epa.gov/oppt/epp/ppg/case/cafeteria.htm.

Zero Waste Standards, http://www.zwia.org/standards.html

1-2 points

EP Credit 2.1-2.2

Toxic Chemical Reduction in Purchasing

Intent

Promote the health of building occupants and reduce disposal costs and liability through toxic chemical reduction in purchasing.

Health Issues

Every person is exposed to a complex mixture of hundreds of chemicals daily. This chemical exposure impacts every human in the world, including developing babies in the womb. [2] Industrial societies are experiencing an increase in chronic diseases and conditions, including some cancers, birth defects, and infertility, asthma, and chemical sensitivities linked, in some instances, to environmental exposures. Toxic chemical exposure also jeopardizes the health of wildlife and ecosystems. Toxic chemicals, once in use, can disperse widely throughout the environment. Environmental monitoring shows that high hazard industrial chemicals and chemicals with unknown health effects are widely distributed in the environment and the food web and are measurable in humans at levels that, in some cases, are known to cause adverse health effects in humans, laboratory animals, and wildlife.

Credit Goals

EP Credit 2.1 (1 Point) – Policy/Structure Development

- Develop, implement and annually evaluate a comprehensive chemicals purchasing policy as part of an environmentally preferable purchasing (EPP) program for all major purchasing decisions that sets goals for the elimination of target chemicals in products and that seeks disclosure on the extent of testing of chemical ingredients in products. Construction materials and furniture and furnishings are excluded from this credit. These topics are covered by GGHC EP Credit 3.1-3.5: Toxic Chemical Reduction: Facility Alterations & Additions and GGHC EP Credit 3.6: Toxic Chemical Reduction: Furniture & Medical Furnishings.
- At a minimum, the chemicals policy shall require:
  - The development of a position and a plan of action to address targeted classes of chemicals. A position is an organizational acknowledgement of the broad issue, with high level support, that communicates to the institution and to the public the general concern and the proposed organizational response to that issue. A plan of action is a written plan, indicating tasks that must be completed, and who is responsible for those tasks, with a timeline.

[2] Environmental Working Group/Centers for Disease Control and Prevention Study, http://archive.ewg.org/reports/bodyburden2/execsumm.php

EP Credit 2.1-2.2 continued

Toxic Chemical Reduction in Purchasing

- Target a list of classes of chemicals for elimination from products purchased by the facility including, at a minimum the following list. A targeted-chemical strategy involves specifically identifying chemicals and materials the institution believes are a priority for elimination, communicating this priority to suppliers, and using purchasing power to support companies that are eliminating these chemicals or materials and replacing them either with substances known to be less hazardous, or with non-chemical alternatives such as changed design. For the purposes of this credit, targeted classes of chemicals are defined as:
  - Phthalates, specifically those listed under California Proposition 65 (Prop 65) plus Di-isononyl phthalate (DINP).

    Listings in Prop 65 as of 12/16/2008 are:

    - Butyl benzyl phthalate (BBP or BzBP)
    - Di(2-ethylhexyl phthalate (DEHP)
    - Di-n-butyl phthalate (DBP)
    - Di-n-hexyl phthalate (DnHP)
    - Di-isodecyl phthalate (DIDP)

    Note: DINP is included due to scientific evidence that it has similar and additive effects to the Proposition 65 phthalates.
  - Polyvinyl chloride (PVC)
  - Persistent bioaccumulative toxic chemicals (PBTs) listed in the U.S. EPA Toxics Release Inventory list of PBT Chemicals and Washington State PBT list
  - Bisphenol-A
  - Carcinogens, mutagens and reproductive toxicants listed under California Proposition 65
  - Halogenated flame retardants
- Annually review policy, progress and goal setting with the facility's group purchasing organization (GPO), purchasing department and other relevant staffers. Identify opportunities for the GPO to participate in market shifting and advocacy on behalf of membership organizations.

EP Credit 2.2 (1 point in addition to EP Credit 2.1) – Implementation

- Demonstrate active change in at least three of the six categories listed above, resulting in a transition to environmentally preferred products as a result of the chemical purchasing policy, including documentation in supply chain, purchasing and/or other committee. For example: An annual report could state, for example: "transitioned to DEHP- and PVC-free IV products, purchased halogenated flame retardant-free TV's, purchased only RoHS-compliant electronic equipment, and eliminated persistent bioaccumulative and toxic chemicals from cleaning products."

  Note: An innovation point is available for product changes in all of the chemical categories as documented in supply chain or other appropriate committee setting.

EP Credit 2.1-2.2 continued

Toxic Chemical Reduction in Purchasing

Suggested Documentation

EP Credit 2.1

- ❑ Compile and annually review documentation verifying implementation of the chemicals purchasing policy, position and plan of action and progress towards achieving the facility's stated goals in accordance with Credit Goals.
- ❑ Maintain a list of products containing the chemicals targeted by the policy in accordance with Credit Goals.
- ❑ Document annual training to appropriate departmental and purchasing staff on proper management of existing toxic chemicals and toxicity reduction activities.
- ❑ Document meetings with the facility's Group Purchasing Organization and/or product supplier and compile and annually review documentation of the environmentally purchasing program, product list and Supplier Environmental Disclosure forms.

EP Credit 2.2

- ❑ Establish metrics for each of the targeted chemicals and annually evaluate progress to meet them in accordance with Credit Goals.

Reference Standards

European Union, RoHS (The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment") Directive, http://www.rohs.eu/english/index.html

Prop 65: State Of California Environmental Protection Agency, Office Of Environmental Health Hazard Assessment, Safe Drinking Water And Toxic Enforcement Act Of 1986, Chemicals Known To The State To Cause Cancer Or Reproductive Toxicity
http://www.oehha.ca.gov/prop65/CRNR_notices/list_changes/pdf/111403lsta.pdf

U.S. Environmental Protection Agency (EPA) Toxics Release Inventory list of PBT Chemicals, http://www.epa.gov/pbt/pubs/cheminfo.htm

Washington State PBT list, http://www.ecy.wa.gov/programs/eap/pbt/pbtfaq.html

Potential Technologies and Strategies:

- ***Credit Synergies:*** *Coordinate implementation of this credit with GGHC IO Prerequisite 1: Integrated Operations & Maintenance Process; GGHC CM Prerequisite 2: Chemical Management Policy and Audit; GGHC CM Credit 1: Indoor Chemical Contaminant Prevention; GGHC CM Credit 2: Pharmaceutical Minimization, Management and Disposal; GGHC WM Credit 2: Regulated Medical Waste Reduction; GGHC EP Prerequisite 2: Electronic Assets Environmental Management Plan; GGHC EP Credit 1: Solid Waste Prevention in Purchasing; GGHC EP Credit 3.1-3.5: Toxic Chemical Reduction: Facility Alterations & Additions; GGHC EP Credit 3.6: Toxic Chemical Reduction: Furniture & Medical Furnishings; GGHC EP Credit 5: Electronics Purchasing & End of Life Management; GGHC EP Credit 6: Office Supplies.*

EP Credit 2.1-2.2 continued

Toxic Chemical Reduction in Purchasing

- Require suppliers to disclose all ingredients covered by the facility's chemicals purchasing policy and to address data gaps in testing for safety for chemicals in their products. The phrase "data gaps" refers to lack of information on the health and environmental impacts of chemicals, the chemical ingredients of many products, and the lack of monitoring for the presence of these chemicals in the environment and in people. A chemicals policy plan would require suppliers to provide data on product ingredients, and to quantify the extent of data gaps for the chemicals contained in their products. A first step would be identifying a short set of questions for suppliers, and requiring responses.
- Review Material Safety Data Sheets (MSDS) and contact the manufacturer directly to identify whether a product or material contains any of the classes of chemicals targeted by the chemical purchasing policy.
- Engage in advocacy to address the systemic problem of inadequately regulated chemicals. Health care professionals remain trusted opinion leaders in society. Health care has an important role to play in the larger public health arena with the goal to adequately regulate targeted chemicals, such as those listed in the Credit Goals. An advocacy strategy is a plan for your institution to influence policy beyond your institution in order to achieve your chemicals policy goals. A first step might be supporting legislation to phase out targeted chemicals in your state, or publicly supporting federal legislation that seeks to address the failures of the current chemical regulatory system.
- Conduct an annual audit of major clinical products to help identify target products.
- Consider developing a procedure for labeling product content.
- Develop a phase-out policy for products where an acceptable alternative exists.
- Ensure there is a program for safe handling and disposal of existing devices containing hazardous substances.
- Consider implementing this credit in coordination with CM Prerequisite 2 – Chemical Management Policy and Audit. Offer annual training to appropriate departmental staff regarding roles and responsibilities associated with the environmentally preferable purchasing program and procedures for segregation, safe handling, and proper disposal of hazardous substances until phase-out is complete.
- At a minimum, meet annually with the facility's Group Purchasing Organization or product supplier to review environmentally preferable purchasing alternatives and progress encouraging manufacturers to:
  - Label products containing the attributes listed above (i.e., chlorine-free, latex-free, non-toxic, etc.)
  - Package units in minimal packaging that is recyclable, non toxic or bio-based
  - Transport products with minimal packaging and move to bio-based packaging
  - Manufacture products that use less energy and water during normal use
  - Manufacture products that use less water and energy during manufacturing
- Give preference to products that are natural rubber latex-free.
- Give preference for products that have manufacture and/or distributor "Take Back" programs

EP Credit 2.1-2.2 continued

Toxic Chemical Reduction in Purchasing

- Identify and track annual progress in toxicity reduction through purchasing practices through supply chain committee meeting minutes.
- Focus on high volume items like halogenated plastic IV bags or other medical apparatus to transition to halogen-free and DEHP free medical devices. Consider starting in neonatal intensive care unit and then expanding to other areas.

Resources

CAS Registry Numbers Associated with Phthalates Identified in Credit Goals, http://www.cas.org/

Butyl benzyl phthalate (BBP or BzBP): CAS #85-68-7

Di(2-ethylhexyl phthalate (DEHP): CAS# 117-81-7

Di-n-butyl phthalate (DBP): CAS# 84-74-2

Di-n-hexyl phthalate (DnHP): CAS# 84-75-3

Di-isodecyl phthalate (DIDP): CAS# 68515-49-1 and 26761-40-0

Di-isononyl phthalate (DINP): CAS# 68515-48-0 and 28553-12-0

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Bornehag, Carl-Gustaf, et. al., “The Association between Asthma and Allergic Symptoms in Children and Phthalates in House Dust: A Nested Case-Control Study,” *Environmental Health Perspectives*, Volume 112, Number 14, October 2004, http://www.ehponline.org/docs/2004/7187/abstract.html

Calafat, AM, et. al., “Exposure of the U.S. Population to Bisphenol A and 4-tertiary-octylphenol: 2003-2004, Environmental Health Perspectives 116:39-44, http://www.environmentalhealthnews.org/newscience/2007/2007-1109calafatetal.html

California Proposition 65, Safe Drinking Water and Toxic Enforcement Act of 1986, http://www.oehha.org/prop65.html

Environmental Working Group, Body Burden Study, http://www.ewg.org/

FDA Public Health Notification on PVC Devices containing the Plasticizer DEHP- http://www.fda.gov/cdrh/safety/dehp.html

Health Care Without Harm, Chlorinated Plastic and DEHP web page, including alternatives, http://noharm.org/us/pvcDehp/issue

Health Care Without Harm DEHP Free NICU Pledge, http://www.noharm.org/details.cfm?ID=1101&type=document

Health Care Without Harm, Guide to Choosing Safer Products and Chemicals: Implementing Chemicals Policy in Health Care, http://www.noharm.org

EP Credit 2.1-2.2 continued

Toxic Chemical Reduction in Purchasing

Health Care Without Harm, Health Care Institutions Undertaking Efforts to Reduce Polyvinyl Chloride (PVC) and/or Di(2-Ethylhexyl) Phthalate (DEHP), http://www.noharm.org/details.cfm?ID=1332&type=document

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Schüler, D, Jager, J, "Formation of chlorinated and brominated dioxins and other organohalogen compounds at the pilot incineration plant VERONA, http://www.cababstractsplus.org/google/abstract.asp?AcNo=20053109301

Kaiser Permanente National Environmental Purchasing Policy, http://www.healthybuilding.net/healthcare/KaiserPermanente-EPP-Policy.pdf

Medical, Academic and Scientific Community Organization (MASCO), Boston, MA: Mercury Work Group, http://www.masco.org/mercury/

Rudel, Ruthann, et. al., "Phthalates, Alkylphenols, Pesticides, Polybrominated Diphenyl Ethers, and other Endocrine-Disrupting Compounds in Indoor Air and Dust," *Environmental Science and Technology* (online), 13 September 2003, http://www.mindfully.org/Pesticide/2003/Phthalates-Indoor-Air-Dust13sep03.htm

Swan, Shanna, "Prenatal Phthalate Exposure and Anogenital Distance in Male Infants, *Environmental Health Perspectives*, Volume 114, Number 2, February 2006, http://www.ehponline.org/docs/2006/8823/letter.html

U.S. Centers for Disease Control and Prevention (CDC) Human Exposure to Environmental Chemicals http://www.cdc.gov/exposurereport/

U.S. Environmental Protection Agency (EPA), Persistent Bioaccumulative and Toxic (PBT) Chemical Program, http://www.epa.gov/pbt/

U.S. Green Building Council, "Assessment of the Technical Basis for a PVC-Related Materials Credit for LEED," https://www.usgbc.org/ShowFile.aspx?DocumentID=2372

U.S. National Toxicology Program, Report on Carcinogens, http://ntp.niehs.nih.gov/index.cfm?objectid=03C9B512-ACF8-C1F3-ADBA53CAE848F635

Vandenberg, Laura N., "Human Exposure to Bisphenol A (BPA), http://www.loe.org/images/070803/Vandenberg%20Exposure%20Rep%20Tox%20resubmission.pdf

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1-5 points

EP Credit 3.1-3.5

Toxic Chemical Reduction: **Facility Maintenance, Alterations & Additions**

Intent

Promote the health of building occupants and reduce disposal costs and liability through purchasing least toxic products.

Health Issues

Every person is exposed to a complex mixture of hundreds of chemicals daily. This chemical exposure impacts every human in the world, including developing babies in the womb. [3] Industrial societies are experiencing an increase in chronic diseases and conditions, including some cancers, birth defects, and infertility, asthma, and chemical sensitivities linked, in some instances, to environmental exposures. Toxic chemical exposure also jeopardizes the health of wildlife and ecosystems. Toxic chemicals, once in use, can disperse widely throughout the environment. Environmental monitoring shows that high hazard industrial chemicals and chemicals with unknown health effects are widely distributed in the environment and the food web and are measurable in humans at levels that, in some cases, are known to cause adverse health effects in humans, laboratory animals, and wildlife.

Credit Goals

- Establish environmentally-preferable specification and purchasing policies for building materials and products used for building maintenance, fit-outs, renovations and additions, as described in the 10 product groups below.

  Note: This credit applies only to base building elements permanently or semi-permanently attached to the building. Examples include, but are not limited to, building components and structures (wall studs, insulation, doors, windows); panels; attached finishes (drywall, trim, ceiling panels); carpet and other flooring materials; adhesives; sealants; paints and coatings. Furniture, fixtures and equipment (FF&E) are not considered base building elements and are excluded from this credit. See GGHC EP Credit 3.6 for FF&E Environmentally Preferable Purchasing. Mechanical, electrical and plumbing components and specialty items such as elevators are also excluded from this credit.

- One point (up to 5 total) will be awarded for each 10% of the total value of all applicable building materials and products (see Note, above), based on project cost, used in maintenance, fit-out, addition and renovation projects during the previous year that meet the product criteria listed below. If the facility undergoes outside contracted projects, the calculation shall either include all of these projects in the calculation, or exclude them.

  Note: This calculation refers solely to material cost exclusive of labor and equipment costs.

Exterior & Structural Components:

Group 1) Roofing and accessories

- Meets requirements of GGHC SSM c4.2: Heat Island Effect: Roof.
- Roofing materials must meet ASTM E-108, UL 790 and UBC Standard 15-2.
- Manufactured with no added halogenated compounds (such as brominated fire retardants) or lead.

[3] Environmental Working Group/Centers for Disease Control and Prevention Study, http://archive.ewg.org/reports/bodyburden2/execsumm.php

EP Credit 3.1-3.5 continued

Toxic Chemical Reduction: **Facility Maintenance, Alterations & Additions**

- No use of hot-mopped asphalt installation techniques.
- Adhesives, sealants, coatings, roofing and waterproofing materials (defined as from the weatherproofing system out and applied on-site) shall not exceed volatile organic content (VOC) limits of South Coast Air Quality Management District (SCAQMD) Rule 1113, Architectural Coatings, rules effective July 1, 2008 as per the July 13, 2007 amendment, and Rule 1168, rules effective date January 1, 2007 as per the January 7, 2005 amendment.

Group 2) Siding or cladding and accessories

- Manufactured with no added halogenated compounds or lead.
- No use of hot-mopped asphalt installation techniques.
- Adhesives, sealants, coatings, roofing and waterproofing materials (defined as from the weatherproofing system out and applied on-site) shall not exceed volatile organic content (VOC) limits of South Coast Air Quality Management District (SCAQMD) Rule 1113, Architectural Coatings, rules effective July 1, 2008 as per the July 13, 2007 amendment, and Rule 1168, rules effective date January 1, 2007 as per the January 7, 2005 amendment.

Group 3) Concrete and pavement:

- Parking lots and other paved surfaces shall not use coal tar sealants

Electrical & Plumbing:

Group 4) Lamps

- In addition to GGHC EP Prerequisite 1, specify and install low mercury fluorescent and high pressure sodium lamps according to the following specifications:

Fluorescent Lamp	Criteria
All T-12 lamps	Do not specify or install
Eight-foot T-8 (Standard and High Output)	18,000 rated hours on instant start ballasts OR 24,000 rated hours on program start ballasts
Four-foot T-8 (Standard and High Output)	18,000 rated hours on instant start ballasts OR 24,000 rated hours on program start ballasts
Three-foot T-8	18,000 rated hours on instant start ballasts OR 24,000 rated hours on program start ballasts
Two-foot T-8	18,000 rated hours on instant start ballasts OR 24,000 rated hours on program start ballasts
U-Bent T-8	18,000 rated hours on instant start ballasts OR 24,000 rated hours on program start ballasts
28-watt T-5	20,000 rated hours on program start ballasts
24-watt T5HO (High Output)	20,000 rated hours on program start ballasts
54-watt T5HO (High Output)	25,000 rated hours on program start ballasts
22-watt Circular T-5	Do not specify or install
Compact fluorescent lamps	Minimum 10,000 rated hours

EP Credit 3.1-3.5 continued

Toxic Chemical Reduction: **Facility Maintenance, Alterations & Additions**

Group 5) Piping & conduit

- Manufactured with no added halogenated compounds or lead

Group 6) Electrical cable and wire

- Manufactured with no added halogenated compounds, lead or phthalates, specifically those listed under California Proposition 65 (Prop 65) plus Di-isononyl phthalate (DINP).

  Listings in Prop 65 as of 12/16/2008 are:

  - Butyl benzyl phthalate (BBP or BzBP)
  - Di(2-ethylhexyl phthalate (DEHP)
  - Di-n-butyl phthalate (DBP)
  - Di-n-hexyl phthalate (DnHP)
  - Di-isodecyl phthalate (DIDP)

  Note: DINP is included due to scientific evidence that it has similar and additive effects to the Proposition 65 phthalates.

Interior finishes

Group 7) Interior Adhesives & Sealants

- Adhesives and sealants used on the interior of the building (defined as inside of the weatherproofing system and applied on-site) shall comply with the requirements of the following reference standards:
  - Adhesives, Sealants and Sealant Primers shall not exceed the VOC content limits established in South Coast Air Quality Management District (SCAQMD) Rule #1168, rules effective January 1, 2007 as per the January 7, 2005 amendment.
  - Aerosol Adhesives shall not exceed the VOC content limits established in Green Seal Standard for Commercial Adhesives GS-36 requirements in effect on October 19, 2000.
  - Adhesives and sealants shall contain no carcinogen or reproductive toxicant components present at more than 1% of total mass of the product as defined in the following lists:
    - California OEHHA, Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65).
    - California Air Resources Board (ARB), list of Toxic Air Contaminants (California Air Toxics).

Group 8) Wall & Ceiling Finishes

- Paints and coatings used on the interior of the building (defined as inside of the weatherproofing system and applied on-site) shall not exceed the VOC content limits established in South Coast Air Quality Management District (SCAQMD) Rule 1113, Architectural Coatings, rules effective July 1, 2008, as per the July 13, 2007 amendment.

EP Credit 3.1-3.5 continued

Toxic Chemical Reduction: **Facility Maintenance, Alterations & Additions**

- Ceiling tiles (including suspended acoustical tiles) and wall coverings shall meet or exceed the indoor air quality requirements of California's Special Environmental Requirements, Specifications Section 01350, as specified in California Department of Health Services Standard Practice CA/DHS/EHLB/R-174. Testing should be conducted by an independent laboratory and modeling should use the standard office building protocol parameters. The following programs currently utilize California 01350 requirements for compliance:
  - Scientific Certification Systems (SCS) Indoor Advantage Gold Environmental Certification Program.
  - GREENGUARD Product Emission Standard For Children & Schools.
  - Collaborative for High Performance Schools (CHPS) Low-Emitting Materials Table.
- Ceiling tiles (including suspended acoustical tiles) and wall coverings shall contain no added halogenated compounds or phthalates, specifically those listed under California Proposition 65 (Prop 65) plus Di-isononyl phthalate (DINP).

  Listings in Prop 65 as of 12/16/2008 are:

  - Butyl benzyl phthalate (BBP or BzBP)
  - Di(2-ethylhexyl phthalate (DEHP)
  - Di-n-butyl phthalate (DBP)
  - Di-n-hexyl phthalate (DnHP)
  - Di-isodecyl phthalate (DIDP)

  Note: DINP is included due to scientific evidence that it has similar and additive effects to the Proposition 65 phthalates.

Group 9) Flooring Systems

- Carpet and resilient flooring systems installed in the interior of the building (defined as inside of the weatherproofing system and applied on-site) shall meet the indoor air quality requirements of California's Special Environmental Requirements, Specifications Section 01350, as specified in California Department of Health Services (DHS) Standard Practice CA/DHS/EHLB/R-174. Testing shall be conducted by an independent laboratory, and modeling shall use the standard office building protocol parameters. Systems shall be tested including backer and adhesive. The following programs currently utilize California 01350 requirements for compliance:
  - Carpet and Rug Institute (CRI) Green Label Plus program for both carpet and adhesive.
  - GREENGUARDProduct Emission Standard For Children & Schools.
  - Scientific Certification Systems (SCS) FloorScore.
  - Collaborative for High Performance Schools (CHPS) Low-Emitting Materials Table.
- Carpet cushion installed in the building interior shall meet the requirements of the Carpet and Rug Institute Green Label program.
- Adhesives shall meet the requirements of Group 7 Interior Adhesives & Sealants.

EP Credit 3.1-3.5 continued

Toxic Chemical Reduction: **Facility Maintenance, Alterations & Additions**

- Flooring systems shall contain no added halogenated compounds or phthalates, specifically those listed under California Proposition 65 (Prop 65) plus Di-isononyl phthalate (DINP).

  Listings in Prop 65 as of 12/16/2008 are:

  - Butyl benzyl phthalate (BBP or BzBP)
  - Di(2-ethylhexyl phthalate (DEHP)
  - Di-n-butyl phthalate (DBP)
  - Di-n-hexyl phthalate (DnHP)
  - Di-isodecyl phthalate (DIDP)

  Note: DINP is included due to scientific evidence that it has similar and additive effects to the Proposition 65 phthalates.

  Note: Carpet stain treatments are exempted from this Credit Goal.

- Coatings, sealants and other finishes applied on wood, concrete or any other flooring materials and products shall meet the VOC requirements of Group 8 Wall & Ceiling Finishes.

Group 10) Composite Wood, Agrifiber Products and Fiberglass Batt Insulation Products

- Composite wood and agrifiber products used on the interior of the building (defined as inside of the weatherproofing system) shall contain no added urea-formaldehyde resins.
- Laminating adhesives used to fabricate on-site and shop-applied composite wood and agrifiber assemblies installed on the interior of the building (defined as inside of the weatherproofing system) shall contain no added urea-formaldehyde resins.

  Composite wood and agrifiber products are defined as: particleboard, medium density fiberboard (MDF), plywood, wheat board, strawboard, panel substrates and door cores. Materials considered furniture, fixtures and equipment (FF&E) are not considered base building elements and are not included.
- Fiberglass batt insulation products shall contain no added formaldehyde.

Note: One innovation point is available for LED lamps that represent a minimum of 10% of total annual lamp purchases (by cost) in maintenance, fit-out, addition and renovation projects.

EP Credit 3.1-3.5 continued

Toxic Chemical Reduction: **Facility Maintenance, Alterations & Additions**

Reference Table VOC Requirements for Groups 1,2,7,8 and 9			
Architectural Adhesives (SCAQMD 1168)	**VOC Limit [g/L less water]**	**Specialty Adhesives**	**VOC Limit [g/L less water]**
Indoor Carpet Adhesives	50	PVC Welding	510
Carpet Pad Adhesives	50	CPVC Welding	490
Wood Flooring Adhesives	100	ABS Welding	325
Rubber Floor Adhesives	60	Plastic Cement Welding	250
Subfloor Adhesives	50	Adhesive Primer for Plastic	550
Ceramic Tile Adhesives	65	Contact Adhesive	80
VCT & Asphalt Adhesives	50	Special Purpose Contact Adhesive	250
Drywall & Panel Adhesives	50	Structural Wood Member Adhesive	140
Cove Base Adhesives	50	Sheet Applied Rubber Lining Operations	850
Multipurpose Construction Adhesives	70	Top & Trim Adhesive	250
Structural Glazing Adhesives	100		
Substrate Specific Applications		**Sealants**	
Metal to Metal	30	Architectural	250
Plastic Foams	50	Nonmembrane Roof	300
Porous Material (except wood)	50	Roadway	250
Wood	30	Single-Ply Roof Membrane	450
Fiberglass	80	Other	420
Sealant Primers		**Aerosol Adhesives (GS-36)**	
Architectural Non-Porous	250	General purpose mist spray	65% VOCs by weight
Architectural Porous	775	General purpose web spray	55% VOCs by weight
Other	750	Special purpose aerosol adhesives (all types)	70% VOCs by weight
Coating (SCAQMD 1113)		**Coating (SCAQMD 1113)**	
Paints (flat and non-flat, except anti-rust)	50	Rust preventative paints & coatings	100
Clear wood finishes: (varnish, lacquer or sanding sealers)	275	Sealers: Waterproofing & all other	100
Floor coatings	50	Shellacs: Clear (avoid)	730
Industrial Maintenance Coatings	100	Shellacs: Pigmented (avoid)	550
Low-Solids Coating	120	Stains	100
Primers and undercoaters	100	Waterproofing Concrete/Masonry Sealers	100
Swimming pool coatings (avoid)	340		

EP Credit 3.1-3.5 continued

Toxic Chemical Reduction: **Facility Maintenance, Alterations & Additions**

Suggested Documentation

- ❑ Document and annually review the sustainable purchasing program covering materials for building maintenance, fit-outs, renovations and additions.Compile documentation including cost for all qualifying materials purchases that meet one or more of the specified sustainability criteria for every building maintenance, fit-outs, renovation and addition project.Scoring

To calculate points associated with multiple projects completed in one year:

1. Add up the number of Product groups in the project that meet all the group criteria and divide by the total product groups in the project. (For example, if a renovation only involved floors, walls, ceilings, lamps and wiring, the total product groups would be 5. If only the floor, walls and ceiling met the criteria, the percentage would be 60%)
2. Multiply that percentage by the total material cost of the project for products covered by CSI (Construction Specifications Institute) Divisions 2-10 (excluding labor and equipment) to get the total toxic avoidance materials value to apply toward the annual total.
3. Total up all project toxic avoidance material values and divide by the total materials value.

Reference Standards

ASTM E-108-07a, “Standard Test Methods for Fire Tests of Roof Coverings,” http://www.astm.org/Standards/E108.htm

California Air Resources Board (CARB), list of Toxic Air Contaminants (California Air Toxics), http://www.arb.ca.gov/toxics/tac/toctbl.htm

California’s Special Environmental Requirements, Specifications Section 01350, as specified in California Department of Health Services Standard Practice CA/DHS/EHLB/R-174, http://www.ciwmb.ca.gov/GreenBuilding/Specs/Section01350/

Carpet and Rug Institute (CRI) Green Label and Green Label Plus programs, http://www.carpet-rug.org/commercial-customers/green-building-and-the-environment/green-label-plus/index.cfm

Collaborative for High Performance Schools (CHPS) Low-Emitting Materials Table, http://www.chps.net/manual/lem_table.htm

GREENGUARD Product Emission Standard For Children & Schools, http://www.greenguard.org/

Green Seal Standard for Commercial Adhesives GS-36, http://www.greenseal.org/

International Code Council, Uniform Building Code Standard 15-2, http://www.iccsafe.org/

Prop 65: State Of California Environmental Protection Agency, Office Of Environmental Health Hazard Assessment, Safe Drinking Water And Toxic Enforcement Act Of 1986, Chemicals Known To The State To Cause Cancer Or Reproductive Toxicity http://www.oehha.ca.gov/prop65/CRNR_notices/list_changes/pdf/111403lsta.pdf

Scientific Certification Systems (SCS) FloorScore program, http://www.scscertified.com/

Scientific Certification Systems (SCS) Indoor Advantage Gold Environmental Certification Program, http://www.scscertified.com/

EP Credit 3.1-3.5 continued

Toxic Chemical Reduction: **Facility Maintenance, Alterations & Additions**

South Coast Air Quality Management District (SCAQMD), http://www.arb.ca.gov/drdb/sc/cur.htm

Underwriters Laboratories, UL 790, "Standard Test Methods for Fire Tests of Roof Coverings," http://ulstandardsinfonet.ul.com/

U.S. Environmental Protection Agency (EPA), Toxic Release Inventory (TRI), http://www.epa.gov/tri/

Potential Technologies & Strategies

- ***Credit Synergies:*** *Coordinate implementation of this credit with GGHC IO Prerequisite 1: Integrated Operations & Maintenance Process; GGHC CM Prerequisite 2: Chemical Management Policy and Audit; GGHC CM Credit 1: Indoor Chemical Contaminant Prevention; GGHC CM Credit 2: Pharmaceutical Minimization, Management and Disposal; GGHC WM Credit 1.4: Solid Waste and Material Management: Recycling and Reuse of Facility Alterations & Additions; GGHC WM Credit 2: Regulated Medical Waste Reduction; GGHC EP Prerequisite 2: Electronic Assets Environmental Management Plan; GGHC EP Credit 1: Solid Waste Prevention in Purchasing; GGHC EP Credit 2: Toxicity Prevention in Purchasing; GGHC EP Credit 3.6: Toxic Chemical Reduction: Furniture & Medical Furnishings; GGHC EP Credit 5: Electronics Purchasing & End of Life Management.*
- Coordinate environmentally preferable purchasing practices with performance criteria, including prioritizing installation of durable construction assemblies.
- Establish a project goal to eliminate use of exterior copper roofing, flashing and gutters at the project's inception if the run-off from the building site flows into a sensitive aquatic zone.
- When purchasing materials, supplies or equipment, specify that these must meet one or more of the specified sustainability criteria.
- Purchase electrical boxes with no added halogenated compounds or lead.
- Consider materials free of added chlorine or other halogens in all applications that meet or exceed performance requirements. PBT-free materials include, but are not limited to: TPO, EPDM, and FPO for roof membranes; natural linoleum, rubber, or alternate polymers for flooring and surfacing; natural fibers, polyethylene, polyester and paint for wall covering; polyethylene for wiring; and wood, fiberglass, HDPE, and aluminum with thermal breaks for windows and copper, steel, concrete, clay, polypropylene, HDPE and borosilicate glass for piping. Cast iron pipe should be avoided based on air quality concerns associated with manufacturing practices (see USGBC TSAC report, "Assessment of the Technical Basis for a PVC-Related Materials Credit for LEED," https://www.usgbc.org/ShowFile.aspx?DocumentID=2372). Consider specifying and procuring halogen-free minor parts when available.
- Establish a lead- and cadmium-free product purchasing goal, and identify products and suppliers to fulfill this goal. Consider products such as silver and other lead-free solder, solderless copper connectors and polyethylene piping, aluminum flashing and Green Seal compliant paints. Note that it is understood that there may be small allowable use of cadmium in equipment beyond the knowledge and access of the purchaser, such as relay contacts.
- Consider lead-free radiation shielding materials.
- Consider incorporating GS-11: Green Seal Environmental Standard for Paints and Coatings, 2nd Edition, into facility specification criteria in addition to the South Coast Air Quality Management District Rule 1113 referenced under Credit Goals.

EP Credit 3.1-3.5 continued

Toxic Chemical Reduction: **Facility Maintenance, Alterations & Additions**

- Consider roofing alternatives that avoid asphalt fumes and odors, such as use of cold-process adhesives, heat welding, self-adhesive or mechanically connected membranes.
- Encourage manufacturers and suppliers to develop halogen-free alternatives. EPA and industry have acknowledged the hazards of halogenated stain treatments and are working to develop alternatives that meet or exceed performance standards.

Resources

CAS Registry Numbers Associated with Phthalates Identified in Credit Goals, http://www.cas.org/

Butyl benzyl phthalate (BBP or BzBP): CAS #85-68-7

Di(2-ethylhexyl phthalate (DEHP): CAS# 117-81-7

Di-n-butyl phthalate (DBP): CAS# 84-74-2

Di-n-hexyl phthalate (DnHP): CAS# 84-75-3

Di-isodecyl phthalate (DIDP): CAS# 68515-49-1 and 26761-40-0

Di-isononyl phthalate (DINP): CAS# 68515-48-0 and 28553-12-0

The American Hospital Association (AHA) and the United States Environmental Protection Agency (U.S. EPA) signed a Memorandum of Understanding (MOU) identifying goals to reduce the impact of health care facilities on the environment. One goal of the MOU is to minimize the production of PBT pollutants, http://www.practicegreenhealth.org

California CRELS (Chronic Reference Exposure Levels), http://www.oehha.ca.gov/air/chronic_rels/index.html

City of Palo Alto, “New Palo Alto Ordinance Prohibits Copper Roofing Materials,” http://www.cityofpaloalto.org/civica/filebank/blobdload.asp?BlobID=6936

Dioxin formation and waste combustion continues to be studied by the U.S. EPA and others. For reference, please consult http://www.practicegreenhealth.org for recent U.S. EPA findings on the subject.

Healthy Building Network, PVC Alternatives Database, http://www.healthybuilding.net/pvc/alternatives.html.

Medical, Academic and Scientific Community Organization (MASCO), Boston, MA: Mercury Work Group, http://www.masco.org/mercury/

National Institute for Occupational Safety and Health (NIOSH), Asphalt Fumes, http://www.cdc.gov/niosh/npg/npgd0042.html

U.S. Centers for Disease Control and Prevention (CDC) Human Exposure to Environmental Chemicals, http://www.cdc.gov/exposurereport/

U.S. Environmental Protection Agency (EPA), Volatile Organic Compounds, http://www.epa.gov/iaq/voc.html

EP Credit 3.1-3.5 continued

Toxic Chemical Reduction: **Facility Maintenance, Alterations & Additions**

U.S. National Toxicology Program, Coal Tars and Coal Tar Pitches, http://ntp.niehs.nih.gov/ntp/roc/eleventh/profiles/s048coal.pdf

PBT elimination is reflected in policies established by a broad range of local, state, federal and international governmental bodies as well as major health care systems and organizations:

The Stockholm Convention on Persistent Organic Pollutants, signed by EPA Administrator Christine Todd Whitman for the United States with officials from 90 other countries in May 2001, addresses dioxins and furans, PCBs and HCB and commits signatories "to reduce the total releases with the goal of their continuing minimization and, where feasible, ultimate elimination." United Nations Environment Programme on Persistent Organic Chemicals, http://www.chem.unep.ch/pops/. Stockholm Convention on Persistent Organic Pollutants http://www.pops.int/.

United Nations Environment Programme (UNEP) Mandate 22/4 on Mercury calls for national action to reduce or eliminate releases of mercury and its compounds. http://www.chem.unep.ch/mercury/mandate-2003.htm.

The Canada – U.S. International Joint Commission (IJC) study of PBTs in the Great Lakes led to a "Canada -- United States Strategy for the Virtual Elimination of Persistent Toxic Substances in the Great Lakes" signed in April of 1997 by both countries. The Strategy targets dioxins and furans, PCBs, HCB, HCBD, cadmium, lead and mercury, among other toxic substances, for elimination. http://www.epa.gov/glnpo/p2/bns.html.

The U.S. Environmental Protection Agency (EPA), in response to the Stockholm Convention, UNEP and IJC, has established a list of target PBTs including dioxins, PCBs, HCB, OCS, lead, and mercury. U.S. EPA Strategy for Priority Persistent, Bioaccumulative and Toxic (PBT) Pollutants, http://www.epa.gov/opptintr/pbt/pbtstrat.htm.

U.S. Environmental Protection Agency (EPA) TRI PBT Chemical List, http://www.epa.gov/triinter/chemical/pbt_chem_list.htm.

Washington State's Department of Ecology has established a list of 22 PBTs including dioxins, HCB, HCBD, cadmium, lead, and mercury that the Department has targeted to be virtually eliminated from Washington sources. Washington State PBT Strategy, http://www.ecy.wa.gov/programs/eap/pbt/pbtfaq.html.

The cities of Seattle and San Francisco have both established plans to reduce PBT releases, including eliminating the use of PVC building materials. City of Seattle PBT Reduction Strategy, http://www.cityofseattle.net/environment/Documents/PBTStrategy3-07-03.pdf.

A wide range of health care related organizations have passed resolutions directly encouraging action by member organizations to reduce dioxin releases or to reduce or eliminate the use of PVC due to its association with PBTs, including the American Public Health Association, American Nurses Association, California Medical Association, Chicago Medical Society and the Maine Hospital Association. Several major health care systems, including Kaiser Permanente and Catholic Healthcare West are acting to reduce their use of PVC and other PBT related materials from health care products and building materials. PVC substitution strategies have been endorsed by more than 120 health care facilities and systems (http://www.noharm.org/details.cfm?ID=1332&type=document) reflecting the associated dioxin releases during manufacturing, accidental or intentional combustion, and at disposal.

Health Care Without Harm listing of resolutions on PVC, http://www.noharm.org/pvcDehp/reducingPVC.
Environmental Working Group's Body Burden Study - http://www.ewg.org/

1 point

EP Credit 3.6

Toxic Chemical Reduction: **Furniture & Medical Furnishings**

Intent

Promote the health of building occupants, reduce disposal costs and liability, and improve health for employees through purchasing least toxic products.

Health Issues

Every person is exposed to a complex mixture of hundreds of chemicals daily. This chemical exposure impacts every human in the world, including developing babies in the womb. [4] Industrial societies are experiencing an increase in chronic diseases and conditions, including some cancers, birth defects, and infertility, asthma, and chemical sensitivities linked, in some instances, to environmental exposures. Toxic chemical exposure also jeopardizes the health of wildlife and ecosystems. Toxic chemicals, once in use, can disperse widely throughout the environment. Environmental monitoring shows that high hazard industrial chemicals and chemicals with unknown health effects are widely distributed in the environment and the food web and are measurable in humans at levels that, in some cases, are known to cause adverse health effects in humans, laboratory animals, and wildlife.

Credit Goals

Ensure that 40% of the annual volume of all freestanding furniture and medical furnishings purchases (including mattresses, foams, panel fabrics, cubicle curtains and other textiles) based on cost meet the following criteria in Options 1, or 2 or 3 below.

The dollar value of any individual product may be added towards the 40% total value if the product meets one of the following criteria:

Option 1

Furniture components, textiles, finishes or dyes: product does not contain more than one of the following chemicals or materials

- Added urea formaldehyde
- Heavy metals: lead, mercury, cadmium, and antimony, except as allowed under the EU RoHS (Restriction of the Use of Certain Hazardous Substances of the European Union) Directive,
- Hexavalent chromium in plated finishes, except as allowed under the EU RoHS (Restriction of the Use of Certain Hazardous Substances of the European Union) Directive.
- Stain and non-stick treatments utilizing perfluorinated compounds (PFCs), including PFOA,
- All other added halogenated compounds (chlorinated and fluorinated plastics and halogenated flame retardants as listed in EPP Credit 3), except PFCs.
- Added antimicrobial treatments containing halogenated compounds and/or silver nanoparticles.

Note: Components composed of or treated with the above substances which constitute less than five percent of the product by weight are exempt.

OR

[4] Environmental Working Group/Centers for Disease Control and Prevention Study, http://archive.ewg.org/reports/bodyburden2/execsumm.php

EP Credit 3.6 continued

Toxic Chemical Reduction: **Furniture & Medical Furnishings**

Option 2

The product contains no more than two of the six above-listed categories of materials AND meets or exceeds the indoor air quality requirements of California's Special Environmental Requirements, Specifications Section 01350 (CA 01350), updated with California DHS Standard Practice CA/DHS/EHLB/R-174 as determined by independent laboratory testing and using the standard office building protocol parameters. The following programs currently utilize CA 01350 requirements for compliance for furniture:

- Scientific Certification Systems (SCS) Indoor Advantage Gold Environmental Certification Program
- GREENGUARD Product Emission Standard for Children & Schools

OR

Option 3

Sustainably Sourced Materials criteria (salvaged, recycled, rapidly renewable, FSC certified wood, local manufacture) See GGHC EP Credit 4.1-4.5: Sustainably Sourced Materials: Facility Alterations & Additions for more details to achieve this portion of the credit.

Note: Furniture and Medical Furnishings do not contribute to GGHC EP Credit 4.1-4.5.

Note: An innovation point for exemplary performance is available to projects that achieve 80% or higher of the annual volume of all freestanding furniture and medical furnishings purchases in compliance with Option 1.

Suggested Documentation

- ❑ Prepare and maintain a matrix listing annual furniture purchases and indicating that the requisite amount of furniture complies with one of the three Credit Goals. Compile backup documentation such as invoices for a minimum one-year period.

Reference Standards

California's Special Environmental Requirements, Specifications Section 01350, as specified in California Department of Health Services Standard Practice CA/DHS/EHLB/R-174, http://www.ciwmb.ca.gov/GreenBuilding/Specs/Section01350/

GREENGUARD Product Emission Standard For Children & Schools, http://www.greenguard.org/

Scientific Certification Systems (SCS), http://www.scscertified.com/

EP Credit 3.6 continued

Toxic Chemical Reduction: **Furniture & Medical Furnishings**

Potential Technologies & Strategies

- ***Credit Synergies:*** *Coordinate implementation of this credit with GGHC IO Prerequisite 1: Integrated Operations & Maintenance Process; GGHC CM Prerequisite 2: Chemical Management Policy and Audit; GGHC CM Credit 1: Indoor Chemical Contaminant Prevention; GGHC CM Credit 2: Pharmaceutical Minimization, Management and Disposal; GGHC WM Credit 1.4: Solid Waste and Material Management: Recycling and Reuse of Facility Alterations & Additions; GGHC WM Credit 2: Regulated Medical Waste Reduction; GGHC EP Prerequisite 2: Electronic Assets Environmental Management Plan; GGHC EP Credit 1: Solid Waste Prevention in Purchasing; GGHC EP Credit 2: Toxicity Prevention in Purchasing; GGHC EP Credit 3.1-3.5: Toxic Chemical Reduction: Facility Alterations and Additions; GGHC EP Credit 5: Electronics Purchasing & End of Life Management.*
- Purchase refurbished furniture and medical furnishings meeting the Option 1 Credit Goal criteria for Toxic Chemical Reduction. Consider leasing and/or buy-back programs.
- Coordinate environmentally preferable purchasing practices with performance criteria for furniture and furnishings.
- Clean and inspect recycled and salvaged mattresses prior to use to verify they are free of allergens and contaminants.
- Identify opportunities to salvage and reuse furniture from existing inventory and research potential used furniture suppliers.
- Salvage and reuse systems furniture and furnishings such as:
  - Case pieces
  - Seating
  - Filing systems
  - Medical furnishings such as exam tables, stools, carts, etc.
- Consider contracting with local and/or regional furniture dealers for reused furniture and furniture recycling programs. Taking advantage of local resources helps save energy and other resources by reducing reshipping impacts and creation of new products using virgin material.
- Encourage manufacturers and suppliers to develop halogen-free alternatives. EPA and industry have acknowledged the hazards of halogenated stain treatments and are working to develop alternatives that meet or exceed performance standards.

EP Credit 3.6 continued

Toxic Chemical Reduction: **Furniture & Medical Furnishings**

Resources

Business and Institutional Furniture Manufacturer's Association (BIFMA), http://www.bifma.org

Dahlberg, Carrie Peyton, "Tiny Silver Particles in Clothing May Lead to Pollution, Research Suggests," Sacbee.com, http://www.sacbee.com/101/story/841669.html

Environmental Working Group's Body Burden Study, http://www.ewg.org/

European Union, RoHS (The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment") Directive, http://www.rohs.eu/english/index.html

Julie Silas, Hansen, Jean, and Lent, Tom, "The Future of Fabric: Health Care," http://www.noharm.org/details.cfm?type=document&ID=1712

Kaiser Permanente, "Evaluation of Antimicrobial Property Claims in Finishes and Fabrics," http://www.healthybuilding.net/healthcare/KP_Antimicrobial_Position_Paper.pdf

Scientific Certification Systems (SCS) Indoor Advantage Gold, http://www.scscertified.com/ecoproducts/indoorairquality/indooradvgold.html

U.S. Centers for Disease Control and Prevention (CDC), CDC Human Exposure to Environmental Chemicals, http://www.cdc.gov/exposurereport/

U.S. Centers for Disease Control and Prevention (CDC), Guidelines for Environmental Infection Control in Health Care Facilities, http://www.cdc.gov/ncidod/dhqp/pdf/guidelines/Enviro_guide_03.pdf

1-5 Points

EP Credit 4.1-4.5

Sustainably Sourced Materials & Products: **Facility Alterations & Additions**

Intent

Reduce the environmental and health burdens of materials and products acquired for building maintenance, fit-outs, additions and renovations.

Health Issues

Resource reuse and recycling eliminates primary extraction of virgin resources and manufacturing, thus preventing associated ecosystem disruption, energy expenditure and toxic emissions, while diverting materials from disposal.

Recycled content materials have the potential to conserve non-renewable resources, lower embodied energy, reduce ecological disruption and air, land and water emissions associated with extracting, transporting, and processing raw materials and manufacturing, and lower global warming potential.

The use of regional building materials may avoid local and remote human health impacts that result from transportation activities and the resulting pollution associated with delivery of materials and products to the project site.

Rapidly renewable materials can yield more material from less acreage, with lower irrigation and pesticide requirements, and avoid significant biodiversity loss if grown at appropriate scale with sustainable agricultural or forestry practices that prevent pollution of water and land resources and help to maintain healthy ecosystems.

Human and environmental health is inextricably linked with forest health. Sustainable forestry protects water quality by reducing water and soil runoff and pesticide and herbicide use. Specifying and procuring certified sustainably harvested wood increases acreage using sustainable management practices. These practices also protect aquatic life, including threatened and endangered species, and maintain viable diverse plant life increasing air filtration and carbon dioxide sequestration. The balancing of carbon dioxide mitigates global climate change, and thereby reduces the spread and redistribution of disease that can be a consequence of climate change.

Sustainable sourcing of materials should not result in compromised indoor air quality, so screening for emissions is a linked attribute.

Credit Goals

Develop and implement purchasing policies for building materials and products that meet the criteria below.

- One point (up to 5 total) will be awarded for each 10% of the total value of all building materials and products (based on cost) used in maintenance, fit-out, addition and renovation projects during the previous year that meet the criteria below. If the facility undergoes outside contracted projects, the calculation shall either include all of these projects or exclude them all. If concrete or steel structural elements are applied toward this credit, the project must include at least two other materials or products from CSI MasterFormat divisions other than 03 and 05 to attain the first point.

EP Credit 4.1-4.5 continued

Sustainably Sourced Materials and Products: **Facility Alterations & Additions**

- The source value of any individual material or product may be added to the total for each of the following four sustainability criteria which the material or product meets:
  - **Salvaged, reused or recycled:** The source value is determined by multiplying the salvaged/reused and/or recycled content fraction of the assembly (based on weight) by the cost of the assembly. The recycled content fraction is the sum of all post-consumer recycled content plus one-half of the pre-consumer content. Salvaged materials are construction materials recovered from existing buildings or construction sites and reused in other buildings.
  - **Regionally sourced/manufactured materials**: Contains only materials and products that have been extracted, harvested or recovered, as well as manufactured within 500 miles of the project site. The source value is 100% of the cost.
  - **Rapidly renewable materials and products** (made from plants that are typically harvested within a ten-year cycle or shorter). The source value for rapidly renewable content is determined by multiplying the rapidly renewable content fraction of the assembly (based on weight) by the cost of the assembly.
  - **Certified wood.** In accordance with the Forest Stewardship Council's (FSC) Principles and Criteria. The source value for certified wood content is determined by multiplying the certified wood content fraction of the assembly (based on weight) by the cost of the assembly.
- Wall, ceiling and flooring systems & finishes, composite wood, agrifiber and fiberglass products, exterior and interior adhesives, sealants, coatings, roofing, and waterproofing products must also meet the relevant GGHC Version 2.2 EQ Credit 4 requirements to contribute toward the credit.
- This credit only applies to materials in CSI MasterFormat Divisions 2-10. Mechanical, electrical and plumbing components and specialty items such as elevators shall not be included in this calculation. Only include materials permanently installed in the project. Furniture is not included (see GGHC EP Credit 3.6).
- Recycled content shall be defined in accordance with the International Organization of Standards document, *ISO 14021-1999—Environmental labels and declarations—Self-declared environmental claims (Type II environmental labeling).*
  - *Post-consumer material* is defined as waste material generated by households or by commercial, industrial and institutional facilities in their role as end-users of the product, which can no longer be used for its intended purpose.
  - *Pre-consumer material* is defined as material diverted from the waste stream during the manufacturing process. Excluded is reutilization of materials such as rework, regrind or scrap generated in a process and capable of being reclaimed within the same process that generated it.

  Note: Fly ash generated as a coal combustion by-product and used as a substitute for Portland cement, may apply as recycled content toward this credit only if compliant with ASTM C618, and only with documentation that the fly ash has verified mercury content ≤5.5ppb (0.0055 mg/L). Fly ash as a by-product from municipal solid waste incinerators does not qualify as a recycled content material for this credit.

EP Credit 4.1-4.5 continued

Sustainably Sourced Materials and Products: **Facility Alterations & Additions**

Suggested Documentation

❑ Compile documentation for all qualifying materials purchases that meet one or more of the specified sustainability criteria and the cost of these purchases for every maintenance, fit-out, renovation and addition project over the previous year.

Reference Standards

Forest Stewardship Council's Principles and Criteria, http://www.fscus.org.

Potential Technologies & Strategies

- ***Credit Synergies:*** *Coordinate implementation of this credit with GGHC IO Prerequisite 1: Integrated Operations & Maintenance Process; GGHC CM Prerequisite 2: Chemical Management Policy and Audit; GGHC CM Credit 1: Indoor Chemical Contaminant Prevention; GGHC CM Credit 2: Pharmaceutical Minimization, Management and Disposal; GGHC WM Credit 1.4: Solid Waste and Material Management: Recycling and Reuse of Facility Alterations & Additions; GGHC WM Credit 2: Regulated Medical Waste Reduction; GGHC EP Prerequisite 2: Electronic Assets Environmental Management Plan; GGHC EP Credit 1: Solid Waste Prevention in Purchasing; GGHC EP Credit 2: Toxicity Prevention in Purchasing; GGHC EP Credit 3.1-3.5: Toxic Chemical Reduction: Facility Alterations and Additions; GGHC EP Credit 3.6: Toxic Chemical Reduction: Furniture & Medical Furnishings*; *GGHC EP Credit 5: Electronics Purchasing & End of Life Management.*
- Identify opportunities to incorporate salvaged materials into building design and research potential material suppliers.
- Consider salvaged materials such as:
  - Beams and posts
  - Flooring
  - Paneling
  - Doors and frames
  - Metal casework
  - Brick
  - Decorative items
- During construction, ensure that the specified recycled content materials are procured and installed and quantify the total percentage of recycled content materials installed. Third party certification can be useful to assure validity of recycling and other sustainable source claims. While mechanical and electrical components are not included in this calculation, specification of products with recycled content is encouraged where available for electrical equipment, such as light fixture housings, electrical raceways and mechanical products such as air ducts, diffusers and return grilles.
- Coordinate environmentally preferable purchasing practices with performance criteria, including prioritizing installation of durable construction assemblies.

EP Credit 4.1-4.5 continued

Sustainably Sourced Materials and Products: **Facility Alterations & Additions**

- Seek to incorporate products into the building design that have recycled content and are recyclable, reusable or compostable at their end of life in the building.
- For rapidly renewable materials, seek materials from producers using low impact sustainable agricultural practices to avoid eutrophication, soil depletion, and use of toxic chemicals. Sustainable agriculture certifications for rapidly renewable materials include, but are not limited to:
  - Certified USDA Organic or equivalent state organic standard.
  - Grown using environmentally sustainable agriculture harvest methods certified through a program that meets the criteria of ISEAL Alliance full membership (e.g., IFOAM organically grown materials).
  - Offset through credits for the same crop type grown using environmentally sustainable agriculture harvest methods certified through a program that meets the criteria of ISEAL Alliance full membership (e.g., IATP Working Landscape Certificates).
- Consider rapidly renewable materials such as:
  - Bamboo flooring
  - Wool carpet and insulation
  - Straw and wheat board
  - Sunflower seed board
  - Cotton batt insulation and duct insulation
  - Soy-based insulation
  - Linoleum flooring
  - Cork flooring
  - Poplar OSB
  - Plastics produced from bio-based materials
- Consider also seeking FSC-certified wood for non-rented temporary construction applications such as bracing, concrete formwork and pedestrian barriers.
- Jointly pursue local/regional materials sourcing in concert with the other categories under the Credit Goal.

Resources

ASTM D4840-99 Standard Guide for Sampling Chain-of-Custody Procedures, http://www.astm.org.

ASTM E2129-01 Standard Practice for Data Collection for Sustainability Assessment of Building Products, http://www.astm.org.

Guides for the Use of Environmental Marketing Claims, 16 CFR 260.7 (e), Federal Trade Commission http://www.ftc.gov/bcp/grnrule/guides980427.htm.

International Standard ISO 14021-1999 – Environmental Labels and Declarations – Self-Declared Environmental Claims (Type II Environmental Labeling), http://www.iso.org.

ISEAL Member certifying organizations, http://www.isealalliance.org/membership

1-3 points

EP Credit 5.1-5.3

Electronics Purchasing & End of Life Management

Intent

Reduce the environmental and health burdens associated with manufacture, use and disposal of electronic products. Require take back and management services for end-of-life electronic products to safely manage hazardous compounds.

Health Issues

While the electronics industry—nationally and internationally—is making strides to reduce the use of toxic chemicals in their products, electronic equipment is not always designed with environmental considerations, recycling or end-of-life disposal in mind. Computers and other electronic wastes can contain toxic chemicals. The average electronic product contains chemicals that are persistent, bioaccumulative toxicants, teratogens, carcinogens, reproductive toxicants, endocrine disruptors, and/or mutagens, including heavy metals such as lead and cadmium in Cathode Ray Tube (CRT) monitors, mercury in Liquid Crystal Display (LCD) and flat panel monitors, and halogenated flame retardants in circuit boards and plastic housings. Workers in manufacturing facilities may be exposed to these toxic substances, and users may be exposed to the toxic chemicals during the products' use.

In addition, due to the increased promotion of new IT equipment and design for short life spans, electronic waste has become one of the world's fastest growing waste streams. According to the U.S. EPA, fifteen to twenty percent of discarded electronics are currently recycled,[5] with the remainder stockpiled or improperly disposed of in landfills or incinerators. Many electronics are exported to developing countries for disassembly under unsafe conditions. Additionally, through burning of halogenated plastics in cable wiring, melting of lead solder in circuit boards and leaching of persistent chemicals from waste stockpiles, toxic chemicals can be released into air, ground, and water, directly exposing recycling workers and adjacent communities to these hazards, and threatening the global public and ecological health.

Credit Goals

EP Credit 5.1 (1 Point) – End of Life Management

- Require manufacturers' or vendor's written commitments of equipment end-of-life management, either through take-back or recycling, in all electronics purchasing contracts.
- For all electronic equipment: Contract only with recyclers that have signed the Electronic Recycler's pledge of True Stewardship (E-Stewards), or that otherwise provide adequate documentation proving they recycle all useable materials and do not export hazardous waste, use prison labor or use incineration (including waste to energy). If using manufacturer or vendor take back programs, verify that they follow the same guidelines in their subcontracting of recyclers.
- Upon hire and annually, provide training on the Electronic Assets Management Plan and end-of-life management protocol to all relevant employees to ensure strict adherence to electronics purchasing and end-of-life management protocol. Ensure recycling protocols are included in GGHC WM Prerequisite 1 – Waste Management Plan.

[5] U.S. Environmental Protection Agency (EPA), General Information on E-Waste, http://www.epa.gov/eCycling/faq.htm#recycled

EP Credit 5.1-5.3 continued

Electronics Purchasing & End of Life Management

EP Credit 5.2 (1 point in addition to EP Credit 5.1) – Office and Commercial Electronic Equipment Purchasing

- Achieve EP Credit 5.1

AND

- Develop and implement purchasing standards requiring a minimum of 90% Energy Star labeled equipment for all Energy Star qualified office and commercial equipment. When Energy Star standards do not exist for a given product category, purchase energy-efficient products that are among the 25th percentile of lowest energy consumers for that class of equipment as designated by the Federal Energy Management Program.
- For computers: Develop and implement purchasing standards requiring that a minimum of 95% of electronic hardware meets or exceeds Silver level EPEAT-registration in all relevant product categories. *Note: In 2007, the EPEAT standard is only applicable to desktop computer and laptops but will expand to other categories of electronics in the future.*
- Include the criteria for the Health Care Without Harm/Hospitals for a Healthy Environment (H2E) Computer Takeback Campaign Purchase Guidelines for Environmentally Preferable Computers (Beyond EPEAT) and the Suggested Environmental Preference and Disclosures for General (non-computer) electronic devices in all RFPs for computers and monitors. Give preference to companies that meet the highest percentage of criteria. (See reference below.)

EP Credit 5.3 (1 point in addition to EP c5.1) – Medical Equipment Purchasing

- Achieve EP Credit 5.1

AND

- Develop and implement purchasing standards requiring a minimum of 50% of all diagnostic imaging equipment (e.g., x-rays, MRIs), sterilization, and physiological monitoring equipment (but excluding other types of medical equipment) to be among the 25th percentile of lowest energy consumers for that class of equipment. Equipment shall be compared based on their continuous (or "standby") mode electrical energy consumption.

Note: Incorporate these standards in the Electronic Assets Environmental Management Plan outlined in GGHC EP Prerequisite 2.

EP Credit 5.1-5.3 continued

Electronics Purchasing & End of Life Management

Suggested Documentation

- ❑ Compile and annually update a listing of all office and commercial equipment purchased and calculations demonstrating that the credit goals have been achieved.
- ❑ Compile documentation such as correspondence, contract language or equivalent documentation verifying that electronic end-of-life vendors are required to comply with the contractual specifications for end-of-life disposition outlined in the Credit Goals.
- ❑ Compile documentation demonstrating continuous improvement for end-of-life management both internally and through contracting for asset disposition, in terms of the number of products purchased, number of products disposed of appropriately, etc.

Reference Standards

Basel Action Network (BAN), Electronic Recycler's pledge of True Stewardship (E-Stewards), http://www.ban.org/

Electronic Product Environmental Assessment Tool (EPEAT), http://www.epeat.net/

Health Care Without Harm/Hospitals for a Healthy Environment (H2E) Computer Takeback Campaign Purchase Guidelines for Environmentally Preferable Computers: Going Beyond EPEAT, http://www.computertakeback.com/docUploads/Beyond%20EPEAT%20Computer%20Purchasing%20Guidelines%20_R5.pdf

U.S. Environmental Protection Agency (EPA) Energy Star, http://www.energystar.gov

Potential Technologies & Strategies

- ***Credit Synergies:*** *Coordinate implementation of this credit with GGHC IO Prerequisite 1: Integrated Operations & Maintenance Process; GGHC FM Prerequisite 2: Minimum Building Energy Efficiency Performance; GGHC FM Credit 1: Optimize Energy Efficiency Performance; GGHC CM Prerequisite 2: Chemical Management Policy and Audit; GGHC CM Credit 1: Indoor Chemical Contaminant Prevention; GGHC WM Prerequisite 1: Waste Management Plan; GGHC WM Prerequisite 2: Waste Generation Profile and Measurement; GGHC WM Prerequisite 3: Solid Waste Land Disposal; GGHC WM Credit 1: Solid Waste and Material Management; GGHC WM Credit 2: Regulated Medical Waste Reduction; GGHC EP Prerequisite 2: Electronic Assets Environmental Management Plan; GGHC EP Credit 1: Solid Waste Prevention in Purchasing; GGHC EP Credit 2: Toxicity Prevention in Purchasing; GGHC EP Credit 3.1-3.5: Toxic Chemical Reduction: Facility Alterations & Additions; GGHC EP Credit 3.6: Toxic Chemical Reduction: Furniture & Medical Furnishings; GGHC EP Credit 5: Electronics Purchasing & End of Life Management.*
- Reduce generation of electronic waste by leasing equipment, purchasing refurbished electronic equipment, upgrading equipment instead of taking it out of service and/or participating in a buy-back program.
- Give preference to products registered with programs such as EPEAT that require all registered products to offer take back and recycling options.
- Provide preference for products that are available with extended warranties and parts for five years.

EP Credit 5.1-5.3 continued

Electronics Purchasing & End of Life Management

- Use the Electronics Environmental Benefits Calculator to determine the environmental benefits of purchasing EPEAT-registered products and publicize this information inside and outside of the institution.
- Where applicable, design data centers with highly efficient temperature management systems. Utilize power supplies that meet the recommended efficiency guidelines of the Server System Infrastructure (SSI) Initiative and that offer the best efficiency at their most frequent operating load level. Analyze the capacity for virtualization, which can significantly reduce the number of servers required and allow some portion of them to go into sleep or off mode during down periods.
- Include asset management and electronics recycling in the Waste Management Plan outlined in GGHC WM Prerequisite 1.
- Include electronics recycling data in GGHC WM Prerequisite 2: Waste Generation Profile as part of the waste profile.
- Demonstrate compliance with the universal waste recycling rules as outlined in U.S. EPA's Resource Conservation and Recovery Act (RCRA).
- Collect all electronics for responsible management, including but not limited to: cell phones, pagers, walkie talkies, hand helds, televisions, fax machines, copiers, monitoring equipment, medical equipment.
- If donating retired equipment, ensure that it is mercury free, works, and has all parts necessary to be of use in other locations where extra parts and servicing might not be available.
- Engage with your Group Purchasing Organization to support responsible purchasing and end-of-life management of electronics for all its members.
- Purchase Energy Star® certified office and commercial equipment that carry the Energy Star®. Examples of these include:
    - Computers and Monitors
    - Copiers, Scanners and Printers
    - DVD Products
    - Exit Signs
    - Vending machines
    - Lighting
    - TVs & VCRs
    - Water Coolers
    - Commercial Clothes Washers
    - Commercial Dish Washers
    - Commercial Solid Door Refrigerators and Freezers

EP Credit 5.1-5.3 continued

Electronics Purchasing & End of Life Management

Resources

Health Care Without Harm, Electronics. Information on purchasing and end-of-life choices for electronic equipment, http://www.noharm.org/us/electronics/issue.

HCWH/H2E/CTBC, Supplemental Purchasing Criteria, http://www.noharm.org/details.cfm?ID=1633&type=document.

Electronics Environmental Benefits Calculator. Information on calculating the environmental benefits of EPEAT-registered products, http://eerc.ra.utk.edu/ccpct/eebc/eebc.html

1-2 points

EP Credit 6.1-6.2

Office Supplies

Intent

Conserve natural resources and promote ecosystem health through purchase of environmentally preferable office supplies.

Health Issues

According to the Healthcare Environmental Resource Center (HERC), the U.S. health care industry generates two billion pounds of paper and cardboard each year.[6] Conventional office practices such as purchasing virgin paper manufactured using chlorine bleach and printing single-sided documents needlessly generates demand for continued logging of forests that provide valuable carbon dioxide sinks and ecological stability in their regions. Using chlorine as the bleaching agent for paper generates persistent bioaccumulative toxic chemicals (PBTs) such as organochlorines and dioxins, known carcinogens which can lead to long term health concerns such as birth defects and cancer. Paper products with high recycled content reduce sulfur and greenhouse gas emissions during manufacture, conserve virgin forest resources and contribute to healthier forest ecosystems. Furthermore, the Health Insurance Portability and Accountability Act (HIPAA) privacy law offers guidelines for safeguarding privacy while recycling paper products.

Credit Goals

Credit 6.1 (1 point)

- Develop and implement an environmentally preferable office supply product purchasing policy (including in-house purchases and contracts with office supply contractors), such that 50% of all office products meet or exceed the following criteria:
  - Office paper products: Most current U.S. EPA Comprehensive Purchasing Guidelines AND meet either FSC Certified Paper requirements, Green Seal GS-07 for Printing and Writing Paper, or Green Seal GS-10 for Coated Printing Paper requirements.
  - Office non-paper products: Most current U.S. EPA Comprehensive Purchasing Guidelines for Office Non-Paper Products, excluding office furniture. See GGHC EP Credit 3.6: Toxic Chemical Reduction: Furniture and Medical Furnishings for environmentally preferable purchasing criteria for furniture and medical furnishings.
- Educate employees on the environmentally preferable office products purchasing initiative upon hire and annually.

Credit 6.2 (1 point in addition to Credit 6.1)

- Achieve EP Credit 6.1

AND

[6] Healthcare Environmental Research Center, http://www.hercenter.org/wastereduction/paper.cfm

EP Credit 6.1-6.2 continued

Office Supplies

- Develop and implement an environmentally preferable office supply product purchasing policy (including in-house purchases and contracts with office supply contractors), such that 50% of all office paper products meet the following criteria:
  - 100% post-consumer recycled content.
  - Certified Processd Chlorine Free®.

Note: An innovation point is available for purchasing practices such that 100% of all office products meet EP Credit 6.1 and 6.2 criteria OR 50% of office paper products contain alternative fiber sources. Fiber sources produced overseas from the project site are not eligible.

Suggested Documentation

- ❑ Maintain and annually review the environmentally preferable office supply purchasing policy in both the facility's Purchasing Policies and in the Waste Plan (See GGHC WM Prerequisite 1).
- ❑ Demonstrate through purchasing records that the credit goals have been met over a minimum one-year period.
- ❑ Maintain documentation of employee orientation to the environmentally preferable office products purchasing initiative (including meeting agenda and educational information).

Reference Standards

Chlorine-Free Products Association, http://www.chlorinefreeproducts.org

Forest Stewardship Council, FSC Certified Paper, http://www.fscus.org/paper/

Green Seal: GS-07 for Printing and Writing Paper; GS-10 for Coated Printing Paper, http://www.greanseal.org

U.S. Environmental Protection Agency (EPA) Comprehensive Procurement Guidelines, http://www.epa.gov/cpg/products.htm.

Potential Technologies & Strategies

- ***Credit Synergies:*** *Coordinate implementation of this credit with GGHC IO Prerequisite 1: Integrated Operations & Maintenance Process; GGHC CM Prerequisite 2: Chemical Management Policy and Audit; GGHC CM Credit 1: Indoor Chemical Contaminant Prevention; GGHC CM Credit 2: Pharmaceutical Minimization, Management and Disposal; GGHC WM Credit 1.4: Solid Waste and Material Management: Recycling and Reuse of Facility Alterations & Additions; GGHC WM Credit 2: Regulated Medical Waste Reduction; GGHC FS Credit 4: Reusable & Non-Reusable Products; GGHC EP Prerequisite 2: Electronic Assets Environmental Management Plan; GGHC EP Credit 1: Solid Waste Prevention in Purchasing; GGHC EP Credit 2: Toxicity Prevention in Purchasing; GGHC EP Credit 3.1-3.5: Toxic Chemical Reduction: Facility Alterations and Additions; GGHC EP Credit 3.6: Toxic Chemical Reduction: Furniture & Medical Furnishings; GGHC EP Credit 5: Electronics Purchasing & End of Life Management.*

EP Credit 6 continued

Office Supplies

- Applicable paper products include, but are not limited to: photocopy paper, letterhead, business cards and printed documents such as annual reports, posters, brochures and other paper products.
- Reduce paper consumption through strategies such as digital data storage, double-sided copying, computer-generated reports and intranet communication. Set up copiers to print duplex as the default setting. Work with the facility Group Purchasing Organization when identifying green office products to make the green choice the default purchase for all office products.
- For ball-point pens and pencils, use only refillable pens and refillable mechanical pencils.
- Purchase copiers and scanners equipped with automatic duplex copying.
- Investigate the availability of additional environmental criteria for office supplies such as recycled content paper certified by the Forest Stewardship Council (FSC) and non-toxic toner.

Resources

California Integrated Waste Management Board's Recycled Content Products Directory – Click on Office Products to find various products with recycled content - http://www.ciwmb.ca.gov/RCP/default.asp

U.S. Environmental Protection Agency (EPA) Buy Recycled Fact Sheets: http://www.epa.gov/cpg/factshts.htm

U.S. Environmental Protection Agency (EPA) Comprehensive Procurement Guidelines supplier database, http://www.epa.gov/epaoswer/non-hw/procure/products/paper.htm

U.S. Environmental Protection Agency (EPA) Green cafeteria program, http://www.epa.gov/oppt/epp/ppg/case/cafeteria.htm

1 point

EP Credit 7

Low Emitting & Fuel Efficient Fleet Vehicles

Intent

Protect human health and improve air quality by reducing emissions from fleet vehicles.

Health Issues

Health care facilities often utilize fleets of vehicles to maintain and operate their facilities. These vehicles range from ambulances to delivery vans to shuttle buses, which often operate continuously and relatively locally. Motor vehicles represent the largest single source of atmospheric pollution including nitrogen oxides (a precursor of smog); benzene (a carcinogen); other volatile organic compounds (some of which are hazardous and precursors of smog); particulate matter (a trigger of respiratory and cardiovascular illnesses and symptoms), carbon dioxide (a greenhouse gas and contributor to global climate change); and carbon monoxide (atmospheric carbon monoxide contributes to the development of atherosclerosis). By reducing emissions, alternative fuel fleets contribute to healthier air quality, benefiting the health of the building occupants and the surrounding community.

Credit Goals

- Evaluate the type, size and number of fleet vehicles required to meet the needs of facility occupants, including programs such as van service for patients with ambulatory impediments and programs aimed at reducing single-person automobile use (as outlined in GGHC TO Credit 1.1).
- Own, lease, or contract with a service that supplies a low-emitting and fuel-efficient or alternative fuel (e.g., biodiesel, compressed natural gas or liquid propane) vehicle fleet, defined as vehicles that are either classified as Zero Emission Vehicles (ZEV) by the California Air Resources Board, having achieved a minimum green score of 40 on the American Council for an Energy Efficient Economy (ACEEE) annual vehicle rating guide, or utilizing ultra-low sulfur diesel fuel and equipped with EPA or California Air Resources Board verified emissions control technology.
- Low-emitting and fuel-efficient or alternative fuel vehicles shall comprise minimum 50% of total fleet mileage driven annually.
- Provide alternative fuel stations, either onsite or by contract, to meet 100% of the fuel needs of the alternative fuel fleet.

EP Credit 7 continued

Low Emitting & Fuel Efficient Fleet Vehicles

Suggested Documentation

- ❑ Demonstrate proof of ownership of, or 2-year lease or contract agreement, for low-emitting and fuel-efficient vehicle fleet and calculations indicating that the vehicles comprise a minimum of 50% of hospital operated vehicle fleet, in terms of miles driven annually.
- ❑ Prepare site drawings showing on-site fueling stations, or contract agreement, in accordance with the Credit Goals.

Reference Standards

California Air Resources Board (CARB) Zero Emission Vehicles (ZEV), http://www.arb.ca.gov/msprog/zevprog/zevprog.htm.

American Council for an Energy Efficient Economy (ACEEE) annual vehicle rating guide, http://www.aceee.org/.

U.S. Environmental Protection Agency (EPA) and California Air Resources Board (CARB) verified emissions control technologies, http://www.epa.gov/otaq/retrofit/nonroad-list.htm.

Potential Technologies & Strategies

- ***Credit Synergies:*** *Coordinate implementation of this credit in coordination with GGHC SSM Credit 2.2: Reduced Site Disturbance: Structured Parking, GGHC SSM Credit 4.1: Heat Island Reduction, GGHC TO Credit 1.1-1.4: Alternative Transportation: Commuting; GGHC TO Credit 1.5: Alternative Transportation: Allowances, and GGHC FM Credit 5.4: Performance Measurement: Emissions Reduction Reporting.*
- Retain existing preferred handicapped parking areas. Handicapped parking is inclusive of any patient population designated by the hospital as eligible to park in handicapped areas.
- Alternative fuel vehicle fleets can be used to provide intra-campus transportation or inter-campus transportation, transportation to remote parking and staff housing, ambulance and ambulette fleets, and carpool/vanpool programs.
- Coordinate the low emitting and fuel efficient vehicle fleet program with a policy establishing an alternative transportation commuting in accordance with GGHC TO Credit 1.
- Biodiesel is becoming available in many markets nationwide, particularly in regions designated as non-attainment areas or where there are high levels of ground level ozone. Low sulfur diesel fuels are required nationally and can be used in all diesel engines without modifications. Biodiesel is usable in most diesel engines as well, although in some older engines may require changing of rubber gaskets and more frequent changing of filters during initial use as it cleans the engine.

EP Credit 7 continued

Low Emitting & Fuel Efficient Fleet Vehicles

Resources

American Council for and Energy Efficient Economy (ACEEE), Green Book, http://www.greenercars.org/

California Energy Commission, Alternative Fuel Vehicles (AFVs) and High-Efficiency Vehicles, http://www.energy.ca.gov/afvs/

U.S. Department of Energy (DOE), State and Federal Incentives and Laws, http://www.eere.energy.gov/afdc/incentives_laws.html

U.S. Department of Energy (DOE), Clean Cities Program, http://www1.eere.energy.gov/cleancities/

U.S. Department of Energy (DOE) and U.S. Environmental Protection Agency (EPA), Fuel Economy website, http://www.fueleconomy.gov/

U.S. Environmental Protection Agency (EPA) National Clean Diesel Campaign, http://www.epa.gov/cleandiesel/

U.S. Environmental Protection Agency (EPA), Transportation and Air Quality, http://www.epa.gov/otaq/