REPORT 1 OF THE COUNCIL ON SCIENCE AND PUBLIC HEALTH (I-08)
Green Initiatives and the Health Care Community
(Resolution 409, A-07, and Resolution 605, A-08)
(Reference Committee K)

EXECUTIVE SUMMARY

Objectives. To define and describe "green" initiatives in the medical community and identify areas in which the health care industry has implemented such initiatives, including waste management, sustainable food programs, and green building. This report also discusses certain environmental health hazards in health care settings, and steps that can be taken to minimize adverse health effects. Resources are provided for further information on green initiatives.

Methods. English-language articles were identified by a Google Scholar and PubMed search from January 1968 to May 2008 using the search terms "green initiatives," "resource conservation," "medical waste," and "recycling." Articles were selected based on their inclusion of solutions or initiatives in the health care setting, or that identified gaps in knowledge. In addition, the web sites of the Environmental Protection Agency, Health Care Without Harm, Practice Greenhealth, and CleanMed were consulted for relevant information.

Results. Management and reduction of medical waste remains a unique challenge for many institutions and practices. Between 30% to 50% of medical waste could be recycled, increasing resource conservation and reducing hospital waste collection costs. Because of the health risks of exposure to dioxins emitted from incinerated waste, reducing the amount of waste that must be incinerated through segregation and recycling efforts is necessary to improve public health. Supporting businesses and choosing products and services that are environmentally sustainable constitutes environmentally preferable purchasing. The purchasing power of the US health care industry is significant and changes in the types of food purchased provide market leadership towards the procurement of food that is ecologically sound and economically viable. Many health care facilities have now implemented Leadership in Energy and Design standards in an effort to reduce exposure to chemicals and toxins, improve indoor air quality, and reduce waste. Green building initiatives also incorporate water and energy conservation standards.

Conclusions. The health care community has made strides in reducing pollution and increasing energy conservation to improve the health of the public. Many green initiatives that have been implemented by the health care sector are applicable community-wide. Current efforts include green building, increased energy efficiency, better waste management practices, and a movement toward the use of sustainable food. The results of these efforts, in conjunction with current federal regulations and standards, will continue to reduce the amount of pollution that causes adverse health effects and will help make hospitals and health care settings healthier environments. Physicians and the health care community have the opportunity to serve as role models and as advocates for healthy and sustainable environments both in the workplace and at home.

REPORT OF THE COUNCIL ON SCIENCE AND PUBLIC HEALTH

CSAPH Report 1– I-08

Subject: Green Initiatives and the Health Care Community (Resolution 409, A-07, and Resolution 605, A-08)

Presented by: Carolyn B. Robinowitz, MD, Chair

Referred to: Reference Committee K (Lynne M. Kirk, MD, Chair)

Resolution 409, Global Warming – Green Initiatives, introduced by the International College of Surgeons and referred at the 2007 Annual Meeting, asks:

> That our American Medical Association (AMA) endorse the development of green initiatives and antipollution programs that may include but not be limited to auto and transportation emissions, waste food handling, and the disposal of biodegradable and non-biodegradable products.

Resolution 605, Encouraging "Green" Initiatives, introduced by the Illinois Delegation and referred at the 2008 Annual Meeting, asks:

> That our AMA encourage green initiatives and further encourage comprehensive efforts to teach children how to live on a planet with finite resources; and that our AMA encourage companies, manufacturers, and public school systems to curtail greenhouse gas emissions and to recycle material and resources.

Within the last year other resolutions on environmental health issues have been referred by the House of Delegates. Resolution 442 (A-07) and Resolution 430 (A-08) are addressed in another Council on Science and Public Health (CSAPH) report at this meeting, on global climate change. Resolution 607 (A-08) calls for our AMA to "conduct an internal assessment of its environmental footprint and research creative solutions to minimize it" and is being addressed by the Board of Trustees. A future CSAPH report in response to Resolution 405 (A-08) will address "sustainable food practices" comprehensively; therefore, the current report limits discussion of this subject to selected purchasing practices in hospital settings.

Our AMA remains committed to environmental stewardship and the reduction of environmental hazards that adversely affect the health of the public. Specifically, our AMA has supported tightening of the Federal Clean Air standards on airborne lead, particulate matter, and ozone. Previous reports of this Council have addressed the health effects of mercury (CSA Report 13-I-04), approaches for reducing environmental exposure to mercury (CSA Report 1-I-06), and the issue of landfill placement over principal aquifers (CSAPH Report 4-A-07).

Action of the AMA House of Delegates 2008 Interim Meeting: Council on Science and Public Health Report 1 Recommendations Adopted and Remainder of Report Filed.

This report focuses on the background and rationale for "green" initiatives in the medical community and highlights areas in which the health care industry has implemented such initiatives, including waste management, sustainable food programs, and green building. The initiatives included in this report reflect environmental health hazards in the medical setting, and actions (initiatives) that can be taken to eliminate them. This report also provides an extensive list of resources that can be consulted by other organizations, companies, and individuals interested in implementing green practices and conservation programs on a community-wide basis.

METHODS

English-language articles were identified by a Google Scholar and PubMed search from January 1968 to May 2008 using the key words "green initiatives," "resource conservation," "medical waste," and "recycling." Articles were selected based on their inclusion of solutions or initiatives in the health care setting. Additional articles were chosen to identify gaps in knowledge, such as those specific to green building, and the impact of pesticides and chemicals on human health. In addition, the web sites of the Environmental Protection Agency (EPA), Health Care Without Harm, Practice Greenhealth, and CleanMed were consulted for relevant information.

AMA POLICY

Several current AMA policies address recycling and conservation. Policy H-135.975 (AMA Policy Database) encourages the medical community to initiate appropriate material recycling programs and use recyclable products, and calls for *AMNews* and other publications to encourage recycling programs. Policy H-135.973 calls on physicians to be spokespersons for environmental stewardship, and encourages the medical community to cooperate in reducing or recycling waste, and to dispose of medical waste in a safe and proper manner. In keeping with this viewpoint, Policy G-630.100 directs our AMA to implement conservation-minded practices and to use recycled paper for its in-house printed matter and publications, including *AMNews*, *JAMA*, and materials used by the House of Delegates. Several other policies (H-135.953, H-135.958, H-135.970, and H-135.983) specifically address medical/biohazardous waste) and are reevaluated by this report in light of current events and practices.

GREEN INITIATIVES: OVERVIEW

Although no formal definition exists, "green initiatives" are practices or programs that are believed to benefit the environment. Some green initiatives are intended to mitigate the effects of global climate change by reducing greenhouse gas emissions, while others primarily aim to improve efficiency and resource conservation within an organization, business, home, or community. Many green initiatives are intended to promote a sustainable environment, where sustainable is defined as "the ability to make a profit or function without sacrificing the resources of another, whether that be people, community, or the environment or planet."[1]

Green initiatives include community-based, corporate, or individual activities, and many resources are available to educate the public and identify specific actions that can be taken. Although this report focuses on green initiatives within the health care industry (especially at the institutional and practice level), many green initiatives can be accomplished by the general public and individual physicians. The following are some approaches that have been consistently noted and endorsed:

- Increasing public knowledge about green initiatives and sustainable practices, including the impact of human behaviors on the environment, and linkages among pollution, global climate change, and health effects.
- Consuming less. Reusing items, completely wearing out items before buying replacements, and buying secondhand items.
- Maintaining or increasing recycling efforts to reduce waste and purchasing products made from reused or recycled materials.
- When purchasing products that are consumables and cannot be reused or recycled, buying items that support fair trade practices and sustainable agriculture, and are produced by socially responsible companies.
- Eating food from local sources. Reducing the amount of preservative chemicals used to transport food and pollution associated with transportation.
- Eating produce that is in season and comes from local sources such as farmer's markets.
- Incorporating efficient transportation practices when possible, such as carpooling, reducing fuel consumption by driving less or using a more fuel efficient vehicle. Use of mass transit or bicycles, or walking.
- Conserving energy (heat and electricity) and water through installation of energy efficient lighting, water conservation appliances, and thermal conserving insulation and windows.

Appendix 1 provides a list of EPA-sponsored partnerships that support green initiatives and resource conservation. Appendix 2 contains a list of web sites with information and resources on green initiatives that can be implemented at the individual level, and can assist parents and schools in educating children about green initiatives and practices.

Many green initiatives that are now in place in hospital systems and health care settings were developed in response to pollution problems specifically associated with the health care industry, and not necessarily in response to global climate change. In the 1980s the health care industry was a recognized polluter and contributor of hazardous and medical waste.[2] Syringes and other medical waste deposited along coastlines prompted increasing public and governmental concern, eventually leading to passage of the Medical Waste Tracking Act in 1988. Subsequently, the amount, treatment, and potential health effects of medical waste became more apparent.[3] Further attention was focused on medical waste in reports on dioxin issued by the EPA, which cited medical waste incinerators as the leading producers of airborne dioxins. [4]

The increased pressure on the health care industry resulted in a strategic partnership among the EPA, the American Hospital Association, and Health Care Without Harm, leading to the formation of Hospitals for a Healthy Environment.[5] Initial objectives of this partnership included the virtual elimination of mercury-containing waste, a 33% reduction in the total volume of hospital waste by 2005, and a 50% reduction in the overall volume of hospital waste by 2010. [6] The collaboration was so successful that Hospitals for a Healthy Environment became an independent, not-for-profit organization in 2006, and was renamed "Practice Greenhealth." This organization's original goals have now expanded to include minimizing the use of and exposure to hazardous chemicals (including persistent, bio-accumulative and toxic substances), improving resource conservation within health care, and integrating sustainable design and building techniques into health care facilities.[7]

Although smaller in scope, the current mission and goals of Practice Greenhealth are somewhat similar to another nonprofit organization, Health Care Without Harm, which seeks to "transform the health care sector worldwide, without compromising patient safety or care, so that it is ecologically sustainable and no longer a source of harm to public health and the environment."[8] Both organizations provide substantial resources for hospitals and practitioners in the form of reports, web-based seminars (webinars), advocacy materials, and general information on how to "green" the health care industry. Both organizations annually recognize hospital systems that show exceptional leadership in greening their facilities.

MEDICAL WASTE

Management and reduction of medical waste is a unique challenge because of concerns about toxicity, biohazards, and contamination. The US hospital system generates approximately 7,000 tons of medical waste daily.[9] Forms of medical waste include regulated medical waste (also referred to as infectious waste), food waste, solid waste, hazardous waste, and pathological waste.[10] Efforts to reduce medical waste in the health care setting focus on reducing volume, properly segregating waste types, and increasing recycling efforts. This in turn helps to reduce the overall amount of infectious waste that must be incinerated or otherwise treated, reducing pollution from incineration and contaminants leaching from landfills.

Several hospitals have been able to reduce waste volume by becoming more cognizant of the sources of waste within their system. Between 30% to 50% of medical waste could be recycled, thereby increasing resource conservation and reducing hospital waste collection costs.[10,11,12] By becoming more aware of their waste profile, hospitals can reduce the amount of waste that is eligible for regulation, further cutting costs. Environmental impact also is reduced because of decreased use of diesel trucks for collection and hauling.

Ongoing educational initiatives on waste reduction for hospital staff are especially important in the hospital setting because of staff turnover. Suggestions include education on types of waste, placing signs or postings at collection bins, and increasing overall awareness of recycling efforts among hospital personnel. Several hospital systems have succeeded in reducing their waste volume and associated costs; for example:

- Kaiser Permanente in Portland, Oregon, reduced its waste by 45% over a 4-year period. This resulted in a 1-year cost savings of $67,000.[9]
- A hospital system in Vermont reduced its regulated medical waste by 76% over 3 months by implementing standards and guidelines modeled after another health facility.
- Beth Israel Medical Center reduced its regulated medical waste costs by 60% through education of staff, waste stream monitoring, and strategic placement of "red bag" waste containers.
- The University of Iowa Hospitals and Clinics reduced its waste volume by 60%, reduced segregation violations by 80%, and saved an estimated $400,000 per year on waste elimination costs.[13]

Dioxin Emissions. As noted above, reducing the volume of medical waste leads to less incinerated waste. Prior to current federal regulations, the majority of hospital waste was burned in on-site hospital incinerators. This included not only infectious waste, but solid waste and recyclable

materials. Emissions from medical waste incinerators included dioxins, mercury, and other pollutants that have adverse health effects. In the mid-1990s medical waste incinerators were cited as the source of 10% of mercury emissions and as the leading source of dioxin emissions.[14] Classified as a known human carcinogen by the EPA, dioxin exposure also has been linked with impaired immune function, developmental delay, endometriosis, and possibly type 2 diabetes.[15-17] The EPA's Dioxin Exposure initiative launched the first Dioxin Reassessment in September 1994; this has been updated in subsequent years, most recently in 2004.[18,19] Although progress has been made in eliminating the majority of airborne dioxin pollution, efforts still continue to reduce these emissions. The 2004 EPA Dioxin Reassessment estimates that the 1995 regulations promulgated for medical waste incinerators and municipal waste combustors have decreased dioxin emissions 95% from 1987 levels (currently used as the baseline). Airborne dioxin concentrations are expected to continue to decrease based on revisions to the Clean Air Act amendments and additional state regulations.[19]

PVC-related Issues. Polyvinyl chloride (PVC) is the most commonly used polymer in the production of plastic hospital products. The addition of high-molecular-weight (HMW) phthalates (pronounced "thay-lates") imparts flexibility to PVC-based products. Approximately 6 million tons of phthalates are produced each year, 13% of that total in the United States. PVC-based medical products include intravenous bags and tubing, basins, bedpans, blood bags and infusion tubing, catheters, peritoneal dialysis bags and tubing, tubing used in cardiopulmonary bypass procedures, extracorporeal membrane oxygenation (ECMO), and hemodialysis, drip chambers, nasogastric tubes, and enteral nutrition feeding bags. Some products contain up to 40% di-(2-ethylhexyl)-phthalate (DEHP) by weight.

The widespread use of PVC raises two safety issues: (1) incineration of disposed PVC products forms dioxin; and (2) DEHP can leach out of PVC into contained liquids, such as intravenous fluids and enteral feeding products. The amount of DEHP that will leach out depends on the temperature, the lipid content of the liquid, and the duration of contact with the plastic. The EPA classifies DEHP as a probable carcinogen, and as a possible endocrine disrupter.[17] Male fetuses and neonates are the most sensitive to the potential harmful effects of DEHP.

The Food and Drug Administration (FDA) conducted a safety assessment in 2001, "Safety Assessment of Di-(2-ethylhexyl)-phthalate (DEHP) Released from PVC Medical Devices."[20] The agency issued an advisory in July 2002 recommending that steps be taken to reduce the risk of exposure to DEHP in certain populations. Health Canada subsequently issued a similar position statement. The FDA recommends that risk assessment precede use of products containing DEHP, and that alternative products be considered when performing high-risk procedures (see below) on male neonates, pregnant women who are carrying male fetuses, and peripubertal males; the FDA did not recommend banning the use of DEHP-PVC (http://www.fda.gov/cdrh/safety/dehp.html).

The National Toxicology Program's Center for Evaluation of Risks to Human Reproduction (CERHR) recently issued an updated report on DEHP,[21,22] which concluded that: (1) DEHP is a reproductive and developmental toxicant in animals; (2) animal studies are relevant to humans; and (3) current exposure levels are of concern for three distinct human populations; namely, critically ill infants, healthy infants and toddlers, and pregnant and lactating women.

The European Union (EU) has also issued directives and drafted risk assessments on the health effects of DEHP. Currently, the EU is implementing a resolution passed in 2005 that restricts the

marketing or use of DEHP for indoor uses, and in medical devices, specifically for vulnerable populations.[23,24] In response to these concerns, hospitals and health systems are urged to reduce their use of PVC products, especially those containing DEHP (AMA Policy H-135.945).

An array of alternatives to PVC medical devices for the neonatal intensive care unit and for medical products/devices in general is available. Alternatives to DEHP-softened PVC fall into two categories. DEHP-free PVC medical devices contain alternative plasticizers, such as citrates, adipates, and trimellitates. PVC-free medical devices are manufactured from silicone, polyurethane, ethylene vinyl acetate, polyethylene, or polypropylene. Alternative plasticizers also may leach from PVC, although at different rates, depending on the nature of the solution in the bag. Although these plasticizers are not suspected of causing any adverse health effects, long-term data are unavailable. Non-PVC plastics possess varying degrees of flexibility and are not a source of dioxin pollution, which may inhibit their use in some medical settings where maximum pliability or flexibility is needed in a product. Careful analysis should be given to the benefits and risks of using a non-PVC product (especially if the duration of use is short and patient interaction is minimized) in place of an alternative.

Because of the many sources of PVC in the hospital setting, there are several opportunities to reduce its presence. Some examples of these efforts are listed below:

- Kaiser Permanente has required its carpet supplier to manufacture a PVC-free carpet to be used in all new facilities; eliminated PVC building products (roof membranes, flooring, furniture, and pipes); and switched to the use of PVC-free nitrile gloves and is removing PVC from all IV bags and tubing.
- Mount Sinai's Lauder Center for Maternity Care eliminated the use of PVC in handrails, window shades, upholstery, and flooring in its new center.
- The Sarkis and Sirian Gabrellian Women's and Children's Pavilion eliminated PVC in all toys, flooring and wall coverings in its new facility.[25]

Medical Waste Incinerators. Because emissions regulations have tightened over the past 20 years, many medical waste incinerators have been shut down; however, more than 3000 are still in operation. Further tightening of air pollution standards will likely reduce the number of operational incinerators, as many will be unable to comply with more stringent emissions requirements without technological upgrades. Infectious waste comprises 5% to 15% of hospital waste, and it must be incinerated, chemically treated, or autoclaved. Many sites have eliminated the use of an on-site incinerator in favor of outsourcing the process to a contractor. Most of these outsourced facilities incinerate the waste themselves. [10,26] Therefore, because of the continued health risks of exposure to dioxins emitted from incinerated waste, reducing the amount of waste that must be incinerated through segregation and recycling efforts is highly recommended to improve public health. Health Care Without Harm advocates that hospital systems investigate and thoroughly evaluate all of their options for non-incineration alternatives.[10]

Purchasing Patterns. Appropriate purchasing is another green approach that can reduce environmental effects. Supporting businesses and choosing products and services that are environmentally sustainable constitutes environmentally preferable purchasing (EPP), which many health care facilities have implemented. EPP requires that purchasers consider the "life cycle" of products and services to assure that the least environmentally detrimental product or service is chosen. In the health care industry this also includes factoring in the toxicity and potential health

effects that an item may cause over time. Although this evaluation can be time-consuming initially, the process results in overall cost savings and supports environmentally friendly options.[27] Because the health care industry represents 15% of the gross national product in the United States, the opportunity to affect the range of available products in the market cannot be overstated. Purchasing cleaners and disinfectants that are hyperconcentrated, nontoxic, and phenol-free can decrease the chemical burden in the environment and create a less toxic atmosphere in the health care setting. [9]

Food service purchasing decisions that increase the availability of healthy and sustainable food are another way to implement EPP at a variety of levels in the health care system. Health Care Without Harm created the "Healthy Food in Health Care Pledge," a framework by which hospitals agree to change their food purchasing and offerings, and to increase education and advocacy around food sourcing issues and options for health care entities. To date, 122 hospitals have signed this pledge (see Appendix 3).[27]

Several other options exist for health care facilities to increase the sustainability of the food that is served. Reduction of pesticide, antibiotic, and hormone exposure in the food supply is the primary goal of all sustainable food programs. Although the exact effects of these substances in the food supply are not established, studies suggest that adverse health effects emerge when pesticides are consumed through food. One systematic review found that several pesticides were linked with adverse health outcomes, concluding "[e]xposure to all the commonly used pesticides…has shown positive associations with adverse health effects." [27,28]

Given the purchasing power of the US health care industry, changes in the types of food purchased can provide market leadership toward the procurement of food that is ecologically sound and economically viable. Several hospitals now purchase only "fair-trade" coffee, meat and poultry that has been raised without (nontherapeutic) antibiotics or hormones, and dairy products produced without synthetic hormones such as rBGH (recombinant bovine growth hormone). Other activities include hosting farmer's markets on hospital grounds, creation of hospital gardens to grow produce for the facility, and eliminating fast food outlets on hospital premises.[25,26,27]

GREEN BUILDING

Perhaps the most visible green initiatives in the health care industry come from the current trend toward "green building." The US Green Building Council (USGBC) created Leadership in Energy and Design (LEED) standards in 2000, which have been adopted primarily by schools and corporate offices. Many health care facilities have now implemented the LEED standards in their existing buildings and when building new facilities in an effort to reduce exposure to chemicals and toxins, thereby improving indoor air quality and reducing waste.[26]

The US health care industry builds between 70 to 75 million square feet of space annually.[26] Improving indoor air quality for patients in hospitals is a goal that can be accomplished in several ways. Material selection is critical when upgrading or building new hospitals, clinics, or offices. Furniture, carpeting, and other materials that are low emitters of volatile organic compounds (VOCs), carcinogens, mutagens and endocrine disrupters; do not trap or contain allergens; and over a lifetime generate the least amount of pollution have all been implemented in hospital systems.[11] Hospital and building systems also have implemented several improvements in ventilation systems. Providence Newberg Hospital in Oregon has a ventilation system that uses

100% outdoor air. Other facilities have installed operable windows in all patient rooms to increase air circulation, or instituted sophisticated heat transfer systems to equilibrate the temperature and humidity of incoming and outgoing air to minimize energy use by the heating, ventilation, and cooling systems.[26]

Green building initiatives also incorporate water and energy conservation standards, which extend to landscaping practices. Gravel is used instead of wood mulch to reduce mold spores, and plants with low pollen counts are chosen to minimize allergens. Landscaping choices also are made based on the availability of native species that require little maintenance to minimize water, pesticide, and energy use. An extension of green landscaping initiatives includes building "healing gardens"--spaces where patients, staff, and visitors can spend time. Installing rooftop gardens is an option for space-limited facilities. [25]

SUPPORTING HEALTHY LIFESTYLES AND REDUCING CHRONIC DISEASE

Health and the environment (both natural and built) have an interdependent relationship. Air pollution (ozone and particulate matter) has been linked with a broad array of adverse health effects, both respiratory and cardiovascular, in epidemiologic and toxicological research. Not only do green initiatives support resource conservation, but successful implementation reduces environmental risk factors for chronic disease. Many communities and health organizations now recognize the increased importance of maintaining clean environments as pathways to improved health outcomes. For example, the Go Green Initiative in East Harlem focuses on reducing asthma rates in area youth by 50% by the year 2010. The initiative includes promotion of green building techniques, as well as strategies to reduce environmental triggers such as fine particulate matter and ozone levels.

These and other green initiatives are consistent with our AMA's commitment to healthy lifestyles. Physicians and other members of the medical community are role models for health and healthy behavior, so changes in hospital and health care food practices are likely to elicit further changes by the public. Encouraging efficient transportation also leads to increases in exercise through greater use of bicycles and walking. Increases in physical activity have been linked to reduction in a number of adverse health conditions. Sustainable food practices also support healthy lifestyles. Providing healthy and environmentally sustainable food options in hospital systems goes beyond resource conservation to include the added benefits of modeling good nutrition habits.

SUMMARY AND CONCLUSION

The health care community has made strides to reduce pollution and increase energy conservation to improve the health of the public. Many green initiatives that have been fostered in health care settings are applicable community-wide. Current efforts include green building, increased energy efficiency, better waste management practices, and a movement toward use of sustainable food. The results of these efforts, in conjunction with current federal regulations and standards, will continue to reduce the amount of pollution that leads to adverse health effects and will help make hospitals and health care settings healthier environments. Physicians and the health care community have the opportunity to serve as role models and advocates for healthy and sustainable environments in the workplace, home, and community.

RECOMMENDATIONS

The Council on Science and Public Health recommends that the following statements be adopted in lieu of Resolution 409 (A-07) and Resolution 605 (A-08) and that the remainder of the report be filed:

1. That our American Medical Association (AMA) support: (a) responsible waste management policies, including the promotion of appropriate recycling and waste reduction; (b) the use of ecologically sustainable products, foods, and materials when possible; (c) the development of products that are non-toxic, sustainable, and ecologically sound; (d) building practices that help reduce resource utilization and contribute to a healthy environment; and (e) community-wide adoption of "green" initiatives and activities by organizations, businesses, homes, schools, and government and health care entities. (New HOD Policy)

2. That in light of the findings of this report, Policies H-135.958, H-135.970, and H-135.983 be rescinded. (Rescind HOD Policy)

Fiscal Note: No significant fiscal impact.

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APPENDIX 1 - Selected US EPA Partnerships for Pollution Prevention

1. Pesticide Environmental Stewardship Program
   Reduce risk from the use of pesticides and to go beyond regulatory requirements to a higher level of environmental stewardship.
2. Reduced Risk for Conventional Pesticides
   Reduce the risk of pesticides and promote the use of integrated pest management thru a voluntary partnership with the pesticide user community.
3. Best Workplaces for Commuters
   Encourages employers to sign a voluntary agreement to offer their employees outstanding, traffic reducing commuter benefits (e.g. significant level of tax-free transit passes, vanpool benefits, telecommuting) as part of a comprehensive commuter benefits package.
4. Coal Combustion Products Partnership (C2P2)
   C2P2 is a joint government and industry program to increase the beneficial use of coal combustion products to reduce energy consumption, greenhouse gas emissions and increase industrial recycling. The goals of the C2P2 program are to increase the use of coal ash as a replacement for Portland cement in concrete from 12.6 million tons in 2002 to 20 million tons in 2010, which will reduce future greenhouse gas generation by over 6.5 million tons annually, and increase the overall use of CCPs from 35%, 2002, to 45 by 2008.
5. Combined Heat and Power Partnership
   Combined Heat and Power (CHP), also known as cogeneration, is an efficient and reliable approach to generating power and thermal energy from a single fuel source. CHP is more efficient, cleaner, and reliable than conventional central power plants. The EPA Combined Heat and Power Partnership is a voluntary program that seeks to reduce the environmental impact of power generation by fostering the use of cost-effective CHP.
6. ENERGY STAR
   Maximizes energy efficiency in commercial, industrial, and residential settings by promoting new building and product design and practices.
7. Green Power Partnership
   Through this program, the EPA supports organizations that are buying or planning to buy green power. As a Green Power Partner, an organization pledges to replace a portion of its electricity consumption with green power within a year of joining the Partnership. The EPA offers credible benchmarks for green power purchases, market information, and opportunities for recognition and promotion of leading purchasers.
8. It All Adds Up to Cleaner Air
   Educates the public regarding the impact of travel choices on air quality, traffic congestion, and public health.
9. SmartWay Transport Partnership
   To improve the environmental performance and fuel efficiency of the US freight sector (truck & rail) through the use of a voluntary market incentive system, that encourages retailers/end users to choose trucking and/or rail companies that are environmental leaders in their respective industry segments.

10. The AgSTAR Program
    Reduce methane emissions at confined animal feedlot operations by promoting the use of biogas recovery systems.
11. Climate Leaders
    Climate Leaders is a voluntary industry-government partnership that encourages companies to develop long-term comprehensive climate change strategies and set greenhouse gas (GHG) emissions reduction goals.
12. Coalbed Methane Outreach Program (CMOP)
    Reduce methane emissions from coalbeds by promoting the profitable recovery and use of coal mine methane.
13. Combined Heat and Power Partnership
    Combined Heat and Power (CHP), also known as cogeneration, is an efficient and reliable approach to generating power and thermal energy from a single fuel source. CHP is more efficient, cleaner, and reliable than conventional central power plants. The EPA Combined Heat and Power Partnership is a voluntary program that seeks to reduce the environmental impact of power generation by fostering the use of cost-effective CHP.
14. GreenScapes
    Unifies government and industry, thereby influencing the reduction, reuse, and recycling of waste materials in large-scale landscaping by providing cost-efficient and environmentally-friendly solutions that conserve natural resources and energy.
15. WasteWise
    WasteWise promotes cost savings and efficiency through waste prevention, recycling, and buying/manufacturing recycled content products. All organization in the United States, including public and private sectors, are eligible for recognition through this innovative program.
16. Design for the Environment
    The goal is to facilitate the identification, adoption and innovation of clean products, processes, technologies, and management systems.
17. Environmentally Preferable Purchasing
    A federal-wide voluntary program that encourages and assists executive agencies in the purchasing of environmentally preferable products and services (products or services that have a lesser effect on human health and the environment when compared with competing products or services serving the same purpose).
18. Federal Electronics Challenge
    The Federal Electronics Challenge (FEC) is a voluntary partnership program that encourages federal facilities and agencies to: 1) purchase greener electronic products, 2) reduce impacts of electronic products during use, and 3) manage obsolete electronics in an environmentally safe way.
19. Green Chemistry
    Promote environmentally benign design of chemical products and processes.
20. Green Engineering
    Design, commercialization, and use of processes and products, which are feasible and economical while minimizing 1) generation of pollution at the source and 2) risk to human health and the environment.
21. The Green Suppliers Network (GSN)
    A collaborative venture between industry, the EPA and the 360vu, a leading provider of assistance to US manufacturers through its national network of Manufacturing Extension

Partnerships (MEP), works with all levels of the manufacturing supply chain to achieve environmental and economic benefits.

22. High Production Volume Challenge
    Ensure that a baseline set of health and environmental effects data on approximately 2800 high production volume chemicals is made available to EPA and the public.
23. National Environmental Performance Track
    To recognize and encourage top environmental performance among private and public facilities, which go beyond compliance with regulatory requirements to achieve environmental excellence.
24. National Partnership for Environmental Priorities (NPEP)
    The goal of the program is to encourage, through recognition, networking, and case example distribution, the minimization of hazardous and industrial wastes, particularly those waste streams containing one or more of the 31 priority chemicals.
25. Sustainable Futures
    Encourage P2 and the development of safer new chemicals, and gain experience regarding the benefits of risk screening methodologies in new product development.
26. National Environmental Performance Track
    To recognize and encourage top environmental performance among private and public facilities, which go beyond compliance with regulatory requirements to achieve environmental excellence.
27. Environmental Technology Verification Program
    Provide 3rd party objective testing information on the performance of environmental technologies to vendors, purchasers, and permitters in sales, purchasing and permitting decision making.
28. Carpet America Recovery Effort
    To increase the amount of recycling and reuse of post-consumer carpet, and reduce the amount of carpet going to landfills.
29. Hospitals for a Healthy Environment
    Educate health care professionals about pollution prevention opportunities in hospitals and health care systems. Through activities, such as the development of best practices, model plans for total waste management, resource directories, and case studies, the project hopes to provide hospitals and health care systems with enhanced tools for minimizing the volumes of waste generated and the use of persistent, bioaccumulative, and toxic chemicals.
30. Plug-In To eCycling
    EPA partners with electronics manufacturers and retailers to increase the number of safe, convenient opportunities Americans have to recycle unwanted electronics and to increase the public's awareness of the need to recycle these products. Plug-In also partners with governments and non-profits that play a key role in the reuse and safe recycling of unwanted consumer electronics.
31. Adopt Your Watershed (OWOW)
    Encourage stewardship of the nation's water resources. As part of this effort, we have also developed two special educational projects--the Girl Scout Water Drop Patch Project and the Watershed Patch Project--that are specially targeted to youth. The groups registered in the database are all involved in watershed protection and restoration activities. Some groups are involved in collaborative watershed management and are actively involved in the development and implementation of comprehensive watershed plans. Other

organizations are involved in volunteer monitoring, stream cleanups, restoration projects, and watershed outreach and education projects.

32. Clean Marinas
    Voluntary, incentive-based program promoted by EPA and others to encourage marina operators and boaters to protect coastal water quality by engaging in environmentally sound operating and maintenance procedures. Offers information, guidance, and technical assistance to marina operators, local governments and boaters on best management practices.
33. Clean Water Act Recognition Programs (OWM)
    To recognize municipalities and industries for demonstrated outstanding and innovative technological achievements in wastewater treatment and pollution abatement programs.
34. Decentralized Wastewater Treatment Systems Program (Septic Systems)
    This Program provides national direction and support to improve the performance of decentralized systems by promoting the concept of continuous management and facilitating professional standards of practice.
35. EPA's Volunteer Monitoring Program
    To encourage support of volunteers throughout the country who are trained to monitor water quality conditions (physical, chemical, biological). Volunteer monitoring programs may share their data with local and state governments, and often become involved in watershed stewardship and education.
36. Five Star Restoration Program (OWOW)
    Provides modest financial assistance on a competitive basis to support community-based wetland, riparian, and coastal habitat restoration projects that build diverse partnerships and foster local natural resource stewardship through education, outreach, and training activities.
37. National Fish Contamination Program (OST)
    The goal of this program is to establish a national consistency in the methods, protocols, and approaches to developing and managing noncommercial fish consumption advisories. Fish consumption advisories are issued to warn consumers of unsafe levels of chemical contaminants in noncommercial fish.
38. National Nonpoint Source Management Program (OWOW)
    Maintain and restore water quality in the face of threats and impairments caused by nonpoint source pollution. Unlike most EPA programs, it addresses one of the major national environmental issues without Federal regulatory authorities.
39. Partnership for Safe Water
    Cooperative effort between EPA, AWWA and other drinking water organizations, with more than 200 U.S. surface water utilities. The Partnership optimizes treatment plant performance and thus increases protection against microbial contamination in our drinking water.
40. Sustainable Slopes - Environmental Charter for Ski Areas (OWOW)
    Formalizes the industry's commitment to environmental sustainability. It outlines "best practices" for ski areas to adopt and implement. A total of 160 ski areas, representing 70% of the country's skier/snowboarding visits, have endorsed the Charter.

APPENDIX 2 - Additional Green Initiatives for Individuals and Homes

Going Green
http://www.thegreenguide.com/green_home/

The Sierra Club
http://www.sierraclub.org/energy/

TreeHugger
http://www.treehugger.com/gogreen.php

World Watch
http://www.worldwatch.org/node/3915?gclid=CKCZpIm3sJQCFQQrFQod3Gvetg

Environmental Defense
http://www.edf.org/page.cfm?tagID=573

Waste Management
http://www.thinkgreen.com/?section=home&CMP=KNC-goinggreen&HBX_PK=going+green&HBX_OU=50

National Resources Defense Council
http://www.nrdc.org/greenliving/

World Wildlife Fund
http://www.nrdc.org/greenliving/

Green Living Ideas
http://greenlivingideas.com/

Green Living Tips
http://www.greenlivingtips.com/

APPENDIX 3 - Healthy Food in Health Care Pledge

The Healthy Food in Health Care Pledge is a framework that outlines steps to be taken by the health care industry to improve the health of patients, communities and the global environment.

As responsible providers of health care services, we are committed to the health of our patients, our staff and the local and global community. We are aware that food production and distribution methods can have adverse impacts on public environmental health. As a result, we recognize that for the consumers who eat it, the workers who produce it, and the ecosystems that sustain us, healthy food must be defined not only by nutritional quality, but equally by a food system that is economically viable, environmentally sustainable, and supportive of human dignity and justice. We are committed to the goal of providing local, nutritious and sustainable food.

Specifically, we are committed to the following healthy food in health care measures for our institution. We pledge to:

Increase our offering of fruit and vegetables, nutritionally dense and minimally processed, unrefined foods and reduce unhealthy (trans- and saturated) fats and sweetened foods.
Implement a stepwise program to identify and adopt sustainable food procurement. Begin where fewer barriers exist and immediate steps can be taken, such as the adoption of rBGH free milk, fair trade coffee, or selections of organic and/or local fresh produce in the cafeteria.
Work with local farmers, community-based organizations and food suppliers to increase the availability of fresh, locally-produced food.
Encourage our vendors and/or food management companies to supply us with food that is produced in systems that, among other attributes, eliminate the use of toxic pesticides, prohibit the use of hormones and non-therapeutic antibiotics, support farmer and farm worker health and welfare, and use ecologically protective and restorative agriculture.
Communicate to our Group Purchasing Organizations our interest in foods whose source and production practices (i.e. protect biodiversity, antibiotic and hormone use, local, pesticide use, etc) are identified, so that we may have informed consent and choice about the foods we purchase.
Develop a program to promote and source from producers and processors which uphold the dignity of family, farmers, workers and their communities and support sustainable and humane agriculture systems.
Educate and communicate within our system and with our patients and community about our nutritious, socially just, and ecologically sustainable healthy food practices and procedures.
Minimize and beneficially reuse food waste and support the use of food packaging and products that are ecologically protective.
Report annually on implementation of this Pledge.