National Environmental Health Association's Overview of Climate Considerations for the Environmental Health Field

1. Introduction to environmental health and NEHA

Environmental health (EH) is the discipline that addresses the impacts of the natural and man-made environments on all aspects of human health. The EH core principles and ethos is to promote, protect, and advance the health of the community. The National Environmental Health Association (NEHA) is the discipline's leading professional organization whose core mission is "to advance the environmental health and protection professional for the purpose of providing a healthful environment for all." An integral part of this mission is to identify trends and issues that will impact the EH profession. In doing so, NEHA can assist EH professionals (EHPs) in planning and preparing for future demands that will shape the work setting in which they operate.

There is perhaps no other set of issues that have the potential to change the profession more than those presented by climate change, sustainability, and the built environment. There is no longer any scientific debate that climate change is occurring. It will change virtually every parameter by which NEHA monitors environmental factors as they relate to human health. Accordingly, NEHA places a high priority on participating in the determination of the proper role of EH in climate change and related issues. As importantly, NEHA seeks to assure that the EH profession is a part of the broader global effort to address climate change.

NEHA is committed to gathering data and sharing information among EH professionals about the strategic advantages of integrating community planning and public health to create healthy and resilient communities. The objective being the establishment of a framework to ensure that human health considerations such as safety and injury; protection from environmental exposures; emerging pathogens; disease vector transmissions; and protection of the traditional environmental media of air, land, and water from the adverse effects of climate change are addressed during the planning process.

2. Why does environmental health need to be involved?

Global climate change is both a cause and an effect of unhealthy human environments, which constitute the very specializations of the EH profession. The Centers for Disease Control and Prevention's (CDC) policy on climate change states that:

"Although scientific understanding of the effects of climate change is still emerging, there is a pressing need to prepare for potential health risks. This public health preparedness approach is applied to other threats in the absence of complete data, such as terrorism and pandemic influenza. A wide variety of organizations (federal, state, local, multilateral, private and nongovernmental) is working to address the implications of global climate change. Despite this breadth of activity, the public health effects of climate change remain largely unaddressed."

Listed below are some specific examples of how climate change can impact human health. These also represent areas where EHPs have the training and expertise to address:

- **Air quality**
  - Indoor air quality (IAQ) – increased level and severity of indoor air pollutants that are known asthma triggers; abnormal rain events and/or floods will also contribute to increased IAQ issues created by mold and moisture.
  - Ambient air quality – negative health impacts among populations from increased frequency and/or severity of wild land fires, elevation concentrations of ozone, and other greenhouse gases; particulate matter and airborne allergens.

- **Drinking Water Quality/Quantity**
  - Respond to changes to existing and/or emerging pathogens in water supplies (waterborne diseases).
  - Alleviate drought impact on communities, such as concentrated contaminates in water supplies due to drought; less water available to large southwestern U.S. cities from loss of mountain snow pack.
  - Minimize increased exposure contaminants due to flooding in events of rising water levels.

- **Water Recreation**
  - Increase in Cyanobacteria toxin (blue-green algae) and other toxins that pose a human health threat.

- **New air and water quality treatments**
  - Develop new air and water treatments to handle the resulting changes in the environment under climate change.
  - Insure that such new technologies will not have a negative impact on human health or the environment.

- **Extreme temperature events**
  - Rise in temperatures contribute to extreme temperature events and to the frequency of heat events, all of which threaten human health.
  - Extreme heat events can endanger the health and well-being of every individual, particularly the elderly (over 65 years of age) and poor urban residents (who may be more severely impacted by the urban heat island effect than rural residents).
  - The effects of the extreme weather events range from loss of life and acute trauma to other effects such as loss of home, disruption of food production, increases in food prices, population displacement, damage to drinking water and sewage systems, and damage to the healthcare infrastructure (CDC, 2007).
  - Social and place-based factors, such as living alone, in low-income housing, and having poor access to public transportation or air-conditioned places leads to higher risk of mortality.
  - Midwestern and northeastern cities are at greatest risk, as heat-related illness and death appear to be related to exposure to temperatures much hotter than on average (Rosenthal, 2007).
  - EHPs play critical roles in developing policies to improve the housing conditions of vulnerable populations and maintain safe access to public places. Both functions play a central role in reducing urban heat-related mortality.

- **Foodborne diseases, food supply, and human nutrition**
  - Changes in long-term rainfall patterns and agricultural yield affect food supply and human nutrition.

- **Severe weather events - disaster sanitation/emergency response**
  - Floods/Hurricanes – provide safe drinking water systems and wastewater systems; minimize chemicals/toxins released in the environment during such events.
  - Shelter sanitation during emergency events – ensure provision of safe food and water, waste disposal, rodent proof food storage areas and housing.
  - Responses to Hurricanes Katrina and Rita raise strong concerns as to how effective public health systems will respond to increasingly frequent, severe, and prolonged disasters enhanced by climate change. There were some short-term success stories with these hurricanes, such as the limitation in food and waterborne infectious disease outbreaks, although there were serious shortcomings in the continuity of health and other services, follow up of vulnerable populations, and protective EH controls (Balbus, 2008).

- **Vector borne disease**[1]
  - Potential increase incidence of vector, tick, and rodent-borne diseases.
  - Emergence of new diseases.
  - Increased range of current disease (e.g., malaria and dengue fever).
  - Increase in endemic disease outbreaks (e.g., Hantavirus and Plague).
  - More rapid spread of disease under increased temperatures.

All of the issues listed above impact EH and are challenges that EHPs are well suited to address. It is paramount that climate change becomes a greater priority for everyone – policy makers, businesses, non-governmental organizations (NGOs), environmental groups, and EHPs.

3. How can environmental health get involved?

EHPs will play a key role in designing and managing programs to protect public health at the local level. As such, the solutions to many of the climate change and land use challenges will also be at the local level. Some specific areas that EHPs can get involved in at the local level include:

- **Advocate for sustainability activities** – EHPs can continue to be an advocate for sustainability activities, with the expectation that people will change their habits, thus the impacts of climate change may be positively affected. Some specific actions EHPs can promote include:

  - Solid waste stream diversion and recycling – reduce the amount of landfill contributions in EHPs' jurisdiction and region; develop work place plans to recycle glass, paper, plastic, batteries, etc.

[1] For more detailed information on how climate change will impact human health, please refer to the 2007 article from NEHA's *Journal of Environmental Health*, entitled 'Climate Change and Human Health in the United States' in Appendix 1 of this paper.

- Promote planting of native vegetation in communities both at work and at home – work with city/county departments to ensure coordination with native plant societies; native plants use less water and are more resistant to local pests (thus requiring less pesticide use).
- Promote use of natural/"green" cleaning chemicals by custodial staffs.
- Transportation – reduce the environmental impact of transportation by supporting efforts within agencies to decrease total vehicle miles traveled by employees who commute (i.e., car pools, vanpools, discounts on city bus transport, employee telecommute, electric car use, bike to work events, etc.)
- Public education and communication – increase public education and awareness, communication, and environmental stewardship.
- Ecosystem health – ensure that the natural environment specifically air quality, water quality and quantity, land use and habitat are maintained to current or improved levels of biological health.
- Sustainable economic and social development – lead programmatic efforts to promote sustainable and profitable business practices (e.g., the restaurant community, "greening" restaurants); promote benefits of composting and recycling; implement water and energy saving ideas; adjust water temperatures for manual dish washing; maintain, clean, and tune existing equipment (clean coils, seals/gaskets) to increase efficiency and reduce energy use; insulate walk-in cooler; buy locally grown produce (within 100 miles); etc.

- **Active involvement in local/regional emergency response agency** – EHPs need to be involved with their local/regional emergency response plans, including participating in practice exercises and responder training. When disaster strikes, EHPs need to be prepared to quickly respond to protect their community of potential health threats. In addition, EHPs, with other emergency response partners, need to assist organizations, businesses, schools, and others to develop response plans specific to their needs.

- **Community design, land use, and sustainability** – Many of the issues outlined in #2 are inextricably linked with issues of community design, land use, and sustainability. EHPs will have to modify their approach and ensure they get a seat at the community planning table to factor the impacts of climate change into development decisions.

  In terms of approach, EHPs will have to approach community design and land use challenges with additional objectives in mind of both reducing health risks where people live, work, go to school, and play with the overall goal of improving the built environment to promote a healthy lifestyle. Many issues related to climate change overlay and are compounded with similar issues related to decisions about land use and land use cover (i.e., more paving impacts increases in the heat island effect and increased non-point source water pollution).

  EHPs also need to expand the range of community issues they are involved in. For example, support the reduction of vehicle miles traveled by supporting walking, biking, and transit; a higher density, mix, and compact uses within communities; and promoting transportation planning decisions that reduce greenhouse gases and source points for ambient air pollution. Although outside the traditional framework of EH programs, these are all timely examples of the more visible role EHPs might play.

In terms of getting a place at the community planning table, if EHPs are "not at the table," then EHPs will not have a voice on critical issues. EHPs need to be intentional in their efforts to see that EH is intrinsic to addressing/responding to the impacts of climate change. As EHPs are skilled at fostering good working relationships with other organizations (NGO and government) to creatively problem solve, such skills need to be capitalized on to provide input on the development or redevelopment of communities in light of the probable impacts of climate change. EH needs to be a part of that plan (such as air quality, water quality and quantity, mosquito control plan, and wastewater management).

4. Environmental health involvement in workforce development

While many EHPs should be at the table to address the various components of climate change as discussed in #2, EH should also be involved through the development of its environmental public health workforce. There is not any question that there will be expectations of environmental and public health officials to develop strategies to address and mitigate the negative outcomes associated with climate change. As such, further training of EHPs through continuing education for current professionals, developing undergraduate and graduate course work, and emergency response efforts (in the areas of responding to disease outbreaks, development and implementation of related emergency response plans, water quality and water quantity matters, etc.) focused on the impacts of climate change must be carried out.

5. Specific actions NEHA can take

NEHA is mindful that EH workforce development goals will need to reflect the reality outlined in #3. As such, through focused partnerships with federal, state, local agencies, other national organizations, and academic institutions, as well as harnessing the opportunities that are already present within its own leadership, NEHA aims to gain a better understanding of and capacity and preparedness for designing education and training to prepare the EH workforce for such challenges. This also includes a need to incorporate specific elements related to climate change as a part of NEHA's current training programs such as, IAQ programs, particularly those focused on homes and schools, insect and rodent control, food safety and protection, emergency response and all hazards preparedness, and EH program performance standards.

NEHA can also aim to develop a policy statement in line with assisting communities to address health impacts of climate change (e.g., "NEHA shall serve as a nationally recognized leader in sustainability through a commitment to community partnerships and balanced stewardship of human, financial, and environmental resources that support member sustainability programs."). In line with this, if adequate resources become available, NEHA is committed to engage the academic community in developing programs to promote sustainability. NEHA expects this effort to have significant impact given that college students today are more enthusiastic about entering the sustainability field than traditional EH programs. If sufficient capacity is developed, NEHA also intends on supporting local and state EH and public health agencies in the creation and staffing of sustainability positions, a trend that is on the rise.

NEHA's Objectives:

Even more specifically, NEHA's work on climate change would be to:

- Ascertain what opportunities and barriers exist, determine strategic directions and next steps for EH officials through data collection with the survey (including interviews);
- Develop tools to assist EH officials in expanding and improving the quality of development reviews within their jurisdiction;
- Assess how to better incorporate health considerations into impacts from climate change and development review processes from EHPs through the pilot programs, survey, and interviews;
- Assist EHPs in becoming effective advocates for land use planning that enhances public health and the environment through the use of the policy statement.
- Enhance education, leadership, and share best practices by documenting white papers, community pilot programs, and/or policies being led by environmental public health professionals. Additionally, develop a formal organizational structure to assist in the development and promotion of an EH focused research agenda related to climate change.
- Develop an assessment tool to gauge the effectiveness of these pilot programs so that positive results can be replicated in other communities.
- Utilize EHPs as a community resource and education tool.

NEHA has committed financial and staff resources in addressing the EH role in climate change. However, it remains a complex effort and much work remains to be done. NEHA plans to deliver on as many of the specific objectives outlined above as sufficient capacity allows.

Increasing NEHA's engagement within its membership regarding climate change could take various forms, such as:

1) **Update NEHA Position Paper for Climate Change**
   This would outline steps that can contribute to the prevention of harmful health impacts from global climate change. To update such a resolution (originally adopted in July 1997), NEHA will invite leadership within the membership and outside to come together and share practical strategies, including a person with a technical background in global climate change to provide feedback on the relative effectiveness of various strategies for the position policy paper. The NEHA Strategic Committee on Sustainability will incorporate elements of its report on sustainability in EH (in Appendix 2 of this paper) into a more specific climate change position paper. After refining such a document, NEHA would then request formal, institutional approval from their respective policy committee and would then promote the policy statement to all members.

2) **Jointly authored white paper**
   This joint project would outline the facts and implications for EHPs on global climate change and the strategies for addressing it. The white paper will serve to educate NEHAs constituencies about what they should do about climate change and why. It can also be useful as a way of communicating priorities to other constituencies with whom NEHA members work, such as staff of other departments (planning or transportation), or to developers, and others in the private sector. Beyond the value of the end product, the process of writing the white paper will build communication, understanding of shared concerns, create relationships, and help identify win-win approaches. Assuming adequate resource availability, NEHA would collaborate with other organizations to

develop a joint white paper. Other organizations might include the American Public Health Association; International City/County Management Association; Centers for Disease Control and Prevention, National Center of Environmental Health; National Association of Local Boards of Health; and/or the National Association of County and City Health Officials.

3) Enhance the role of NEHA's Strategic Committee on Sustainability

This committee created by the NEHA Board of Directors can become an even more active entity within the NEHA organizational structure to identify future needs, manage a process whereby NEHA produces a research agenda related to these issues, and keep the EH workforce informed on these issues.

4) Development of a draft comprehensive development review tool

When local planning departments want to know the health impacts of a proposed project, they generally refer the development application to the local health department for review by both community health and EH programs. Typically, local EHPs limit their comments to regulatory requirements for air and water quality, waste and wastewater management, and sanitation. NEHA needs to explore ways to provide tools and strategies to EHPs to be better informed and increase their engagement in the planning process as it relates to climate change impact and human health.

If funding was obtained, NEHA's first goal would be to construct a development review tool centered around EH factors. Such a tool would provide a standard for developing and applying EH factors into a more comprehensive review of community development plans. This would also serve to better define the role of EHPs in the process of land development and serve to bridge the gap that currently exists between EHPs, community development, and land use planning professionals.

Additionally, EH officials, with this tool would be better equipped to educate planning professionals and policy makers about potential health impacts and benefits of land use choices and improve the quality of land use decision-making.

5) Community pilot programs[1]

NEHA's membership can work to enable new ideas and innovative approaches to be tested in and shared between health departments and communities. Grounded in the strategy ideas identified in the writing of a policy resolution and white paper, NEHA and the chosen communities could plan and possibly implement some new approaches and work in a targeted manner with approximately three local health departments EH division/staff. They would then assist with the development of the tool (described in detail above), pilot test the tool, and overall act as the advisory committee. Separate grant funding could be made available to individual EH programs to implement and evaluate these demonstration projects.

[1] For more detailed information on an example of a pilot program that is in progress, please refer to the 2009 article from NEHA's *Journal of Environmental Health*, entitled 'Addressing Climate Change and Local Public Health: The Austin Climate Protection Program and the CDC Working Group on Climate Change Collaboration' in Appendix 3 this paper.

6) NEHA should also conduct a National Survey

There is a significant need for research data to better understand the role of EHPs in land use planning/design, public health, and associated climate change. The survey results specific to land use planning/design and public health from two and a half years ago have been repeatedly presented at approximately nine state and national conferences. The 2008 trend data were summarized and presented at NEHA conferences and on the NEHA Web site and related material has been disseminated in NEHA's *Journal of Environmental Health*.

The new survey would aim to closely replicate the questionnaire in the 2004 survey plus additional questions can be added on roles, levels of involvement, and climate change. The survey would be sent out to NEHA membership. Some follow-up interviews could also potentially be conducted to determine another level of detail. Some example issues/questions include: issues addressed or never addressed when commenting on development plans; needs of EHPs on the issue; how often they communicate with planners; better understanding of capacity, competencies, level of awareness of the potential health impacts of climate change, and perception of risk posed by climate change.

7) EH outreach and education

By the very nature of their responsibilities, EHPs have a high degree of community involvement. They also have a high degree of credibility within the community. Given this, EHPs are uniquely positioned to educate the public on issues of climate change and sustainability. Moreover, they are well positioned to promote behavior changes within the community that will serve to enhance the response to health threats associated with climate change. NEHA has a strong interest in developing a community-based outreach and education model on climate and sustainability that replicates community outreach models done on the topics of IAQ, radon testing and mitigation, and food safety.

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Climate Change and Human Health in the United States

Editor's note: NEHA strives to provide up-to-date and relevant information on environmental health and to build partnerships in the profession. In pursuit of these goals, we will feature a column from the Environmental Health Services Branch (EHSB) of the Centers for Disease Control and Prevention (CDC) in every issue of the Journal.

EHSB's objective is to strengthen the role of state, local, and national environmental health programs and professionals to anticipate, identify, and respond to adverse environmental exposures and the consequences of these exposures for human health. The services being developed through EHSB include access to topical, relevant, and scientific information; consultation; and assistance to environmental health specialists, sanitarians, and environmental health professionals and practitioners.

EHSB appreciates NEHA's invitation to provide monthly columns for the Journal. *EHSB staff will be highlighting a variety of concerns, opportunities, challenges, and successes that we all share in environmental public health.*

Worldwide, the effects of climate change are apparent, and there are changing exposures that have significance for human health. Temperature increases and increased weather variability have already brought higher probabilities of Category 4 and Category 5 hurricanes (Webster, Holland, Curry, & Chang, 2005) and higher sea levels (Rignot & Kanagaratnam, 2006), and have contributed to increased forest fire frequency and severity (Westerling, Hidalgo, Cayan, & Swetnam, 2006). Since carbon dioxide (CO_2) emissions persist in the atmosphere for approximately 100 years and CO_2 emissions are continuing to rise, the negative health effects of climate change are likely to accelerate and persist into the foreseeable future. Although our understanding of climate change processes is incomplete, the most significant health-related exposures are relatively well understood (see sidebar on page 44), and our understanding of their expected geographic distributions is quickly evolving.

Because the United States is a wealthy country with a well-developed public health infrastructure, climate change is expected to have less of a health impact here than in the developing world, where changes are likely to be devastating (Patz, Campbell-Lendrum, Holloway, & Foley, 2006). Nevertheless, even in the United States, the health impacts of climate change may be significant:

- Catastrophic weather events will be more frequent and increasingly costly (Greenough et al., 2001).
- The population will age, increasing vulnerability to extreme heat events and several other exposures associated with climate change.
- Injury secondary to extreme weather events may advance as a cause of morbidity and mortality.
- The severity of many chronic diseases now responsible for the bulk of mortality in the United States may increase secondary to climate change (Bernard, Samet, Grambsch, Ebi, & Romieu, 2001).
- Outbreaks of vectorborne diseases may become more frequent, widespread, and lengthy (Gubler et al., 2001).
- Mental health stresses from climate change may most affect younger Americans as well as those affected by disasters and economic hardship as a result of ecosystem change (Balbus & Wilson, 2000).

Our neighbors to the south will be dealing with similar ecologic and health impacts, including desertification (Neelin, Münnich, Su, Meyerson, & Holloway, 2006), increased freshwater runoff and associated flood frequency (Scholze, Knorr, Arnell, & Prentice, 2006), and possible food shortages (Gregory, Ingram, & Brklacich, 2005) and water shortages. These stresses may contribute to mass migration and environmental refugees, regional tension, and, potentially, armed conflict.

Anticipating and responding to these challenges is a complex task. Expected significant regional variation in the health burdens from climate change adds further complexity (Patz et al., 2000). The northern latitudes of the United States will experience the largest increases in average temperatures (Kalkstein & Smoyer, 1993); as a result, they will also bear the brunt

Climate Change: Some Health Outcomes of Concern for the United States

- heat stress, direct thermal injury, and exacerbations of associated illnesses
- respiratory diseases, including asthma, chronic obstructive pulmonary disease, and allergic disease
- injuries and other morbidity from extreme weather events and forest fires
- waterborne diseases and effects of harmful algal blooms
- vectorborne infectious diseases
- hunger and malnutrition from disruption of the food supply
- mental health effects
- secondary health effects from conflict over scare resources, mass migration and population displacement from disasters, and economic disruption (Patz, Campbell-Lendrum, Holloway, & Foley, 2000)

of increases in ground-level ozone and associated airborne pollutants in urban areas. According to our current understanding of the epidemiology of heat-related injury and illness, populations in northeastern and coastal cities will have the highest increases in morbidity and mortality over baseline as heat waves increase in frequency, severity, and duration (McGeehin & Mirabelli, 2001). Concurrently, cold-related mortality in the United States is expected to decrease (McMichael et al., 2006). Coastal regions will experience essentially uniform risk of sea level rise, but different rates of coastal erosion, wetlands destruction, and topography will result in dramatically different regional effects of sea level rise. Vector distributions will widen; ranges of many vectors will extend northward and increase in elevation (Gubler et al., 2001). For some vectors, such as Rodentia associated with hantavirus, ranges will extend on the basis of changes in precipitation and vegetation (Gubler et al., 2001). The West coast of the United States is expected to experience significant strains on water supplies as regional precipitation declines and mountain snowpacks are depleted (Gleick & Chalecki, 1999). Forest fires are expected to increase in frequency, severity, distribution, and duration (Westerling et al., 2006).

The expected health effects of climate change present a novel public health problem with unprecedented scope, timeline, and complexity. It is important to recognize, however, that specific exposures resulting from climate change are not themselves categorically novel. Instead, familiar exposures will shift and widen in distribution, increase in frequency, and intensify in magnitude. Currently rare events may become common and anomalous events usual. These changes will unfold over decades. Therefore, climate change will act as a general stressor on the public health infrastructure, and gaps and weaknesses in our ability to respond to health threats must be identified and ameliorated.

To respond to these challenges, in January 2007, CDC convened a workshop of experts on climate change to discuss the public health response to climate change. Participants, including representatives from federal, state, local, and international agencies, academia, nongovernmental organizations, and the private sector, discussed "framing" climate change in public health terms and identified priority areas for public health action. Drawing from the meeting discussions, CDC has developed a policy statement and has identified 11 priority health actions for climate change (see http://www.cdc.gov/nceh/climatechange/).

The shift of public dialogue on climate change to the mainstream underscores the need to frame its projected impacts as a public health issue as well as an economic, environmental, and social issue. Public health must take a leadership role in preparing for the consequences of climate change. An effective public health response will require a new, synergistic approach that can accommodate the complexity of the exposure interactions and engage a variety of stakeholder groups in efforts to develop adaptation measures.

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The Role of Sustainability in Environmental Health

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Introduction

Given the current interest in sustainability, the National Environmental Health Association (NEHA) assembled an ad-hoc committee to identify NEHA's role in sustainability. The charges for this committee were: (1) develop resources for regulators (2) develop resources for the general public, and (3) identify and document how sustainability is connected with environmental health.

The goal of this report is to address the above charges, and provide information on the relationship between sustainability and environmental health. This report will discuss environmental health's role in several topics regarding sustainability including energy, water use, agriculture, waste management, urban design, built environment, and climate change.

NEHA – Background Information

The National Environmental Health Association (NEHA) was established in California in 1937 with the purpose of establishing a standard of excellence in the field of environmental health. NEHA's mission is "to advance the environmental health and protection professional for the purpose of providing a healthful environment for all." NEHA strives to achieve this mission by implementing a strategic initiative that includes training and education, credentialing, advocacy, and organizational capacity. NEHA has identified sustainability as an important program area for environmental health, and has recently added a new technical section on sustainability.

NEHA's focus on sustainability's role in environmental health includes the areas of renewable energy, energy conservation, water conservation, pollution prevention, and green building. In addition, in 2008 NEHA began honoring a worthy city, business, organization, association, or individual with the NEHA Excellence in Sustainability Award. The Award is sponsored by Underwriters Laboratories Inc, and is granted for solving environmental challenges by using innovative environmentally sustainable practices.

NEHA has been dedicated to providing environmental health professionals with the highest possible level of environmental health training, education, and services for over 70 years, and they are committed to continuing their mission for the future.

Defining Sustainability and its Role in Environmental Health

Sustainability is imperative for the future well-being and prosperity of humanity, and it is especially significant with respect to environmental health.

The classic definition of sustainability established by the Bruntland Commission is "meeting the needs of the present generation without compromising the ability of future generations to meet their needs." This definition of sustainability can be applied to any number of human actions including the use of natural resources, pollution, energy consumption, waste management, and many more. For example, the sustainable use of natural resources would involve using resources in such a way that they meet the needs of the current generation, without depleting these resources for the future.

With respect to environmental health, we can define sustainability as meeting the needs of the present generation without negatively impacting the environmental health of the future. NEHA states "environmental health and protection refers to protection against environmental factors that may adversely impact human health or the ecological balances essential to long-term human health and environmental quality". Therefore, sustainability's role in environmental health is to ensure that the actions of our current generation do not have negative impacts on the human health and environmental quality of the future.

Sustainable practices in energy consumption, water use, agriculture, waste management, and urban design will collectively play a pivotal role in maintaining environmental health for future generations.

Sustainability and its Impact on Human Health

Sustainable practices have the potential to have a significant impact on human health. Several aspects of human health can be drastically improved by implementing more sustainable environmental practices.

- Sustainable energy consumption, including increased use of renewable energy resources, could significantly reduce mobile and stationary source air pollution and reduce the associate human health effects such as respiratory and cardiovascular illnesses.
- Sustainable water use involves developing ways to provide persistent and renewable clean water sources. Providing clean water sources today, and ensuring that these sources will persist for the use of future generations, can limit the adverse health effects associated with improperly treated water and minimize the frequency and severity of water shortages.
- Sustainable agricultural practices can provide a more nutritious food supply, and minimize food shortages.
- Sustainable waste management involves limiting the waste we put into our landfills, and recycling and reusing as many products as possible. By limiting waste, we can limit the health effects associated with waste including air pollution, run off into our water sources, and exposure to toxic and hazardous waste.
- Sustainable architecture and urban design can decrease energy consumption, and create more efficient and environmentally friendly buildings.

Overall, sustainable practices have the potential to have a significant impact on human health and the health of the environment, both now and for the future.

Sustainable Energy

Energy sustainability is a complex issue that involves environmental, political, and economic implications. Sustainable energy can be defined as the provision of energy resources such that we are able to meet the energy needs of today without compromising future generations. Unsustainable energy use has the potential to compromise future generations in several different ways. Energy resources could become depleted, which could in turn create serious political and economic consequences. Unsustainable energy consumption, which includes the burning of fossil fuels, is also known to have environmental consequences including air pollution, and environmental degradation.

The use of unsustainable energy resources can also have serious effects on human health. The significant air pollution correlated with the use of unsustainable energy such as burning fossil fuels can have dire consequences. Respiratory complications such as asthma can be caused by the major air pollutants: ozone, carbon monoxide, nitrogen oxides, sulfur dioxide, particulates, and volatile organic compounds (VOCs). All of these pollutants are emitted from the burning of fossil fuels. In particular, ozone (O3), which is formed in a reaction involving sunlight and fossil fuel emissions such as hydrocarbons and nitrogen oxides, can cause serious lung damage. Cardiovascular complications such as heart disease can be caused as a result of emissions of carbon monoxide, sulfur dioxide, and particulates. Toxic organic compounds such as PCB's (Polychlorinated biphenyls) and dioxins, which are emitted from industrial processes, have proven to be carcinogenic in high levels of exposure. Mercury pollution has been proven to be capable of causing severe nervous system damage. Nervous system damage can also occur from exposure to carbon monoxide pollution. Clearly, the effects from air pollutants emitted from unsustainable energy sources can have a significant impact on human health.

Unsustainable energy consumption can also have a considerable impact on the environment. Air pollution from the combustion of fossil fuel resources can cause smog (from ozone), regional haze (from particulate matter), and acid rain (from nitrogen oxides and sulfur dioxides). Along with air pollution, several other facets of environmental degradation can be attributed to unsustainable energy use. Surface and ground water pollution can be caused by drilling and excavating of oil, coal, and gas reserves. During the drilling or excavation process, the fossil fuels can seep into the water source, polluting the water system. Fossil fuel use also requires a great amount of infrastructure for drilling, production, and storage. This significant land use and destruction resulting from fossil fuel extraction can also have serious impacts on wildlife. Another major environmental degradation from fossil fuel use is oil spills, which have the capacity to essentially destroy the entire balance of an ecosystem. Unsustainable energy consumption undoubtedly can have substantial negative impacts on ecosystems and the environment.

Sustainable energy, on the other hand, is most often associated with application of renewable energy resources. Renewable energy resources are sources of energy generated from natural resources that are naturally replenished, and are not depleted over time. These resources include solar power, wind generated power, geothermal, hydropower, and biofuels. Harvesting more sustainable energy will be beneficial in several ways. First, sustainable energy can be produced domestically, minimizing our dependence on foreign oil. Additionally, given that sustainable energy sources are not depleted, energy prices could remain relatively stable over time. Perhaps the most important contribution of sustainable energy sources is the human health and environmental benefits. Renewable energy resources are generally described as being "clean" energy sources. No energy can be produced without a consequence, but the negative impacts created by sustainable energy use are substantially less than those caused by unsustainable energy. The amounts of air pollution and environmental degradation are significantly less when applying renewable energy technologies in comparison to fossil fuel consumption.

Environmental health and energy consumption are invariably connected. It is clear that energy use has significant impacts on human health and the health of the environment. Sustainable energy has the ability to make a major impact in reducing the negative consequences of energy consumption on environmental health. Sustainable energy use can reduce the harmful effects on human health from air pollution and reduce the amount of environmental degradation. As we move forward, an

increased effort to implement a more sustainable method of energy consumption will be imperative towards maintaining a high quality of environmental health for future generations.

Water and Sustainability

Environmental health professionals are involved in many areas of water quality issues including water supply protection, the education and management related to water-borne diseases, beach water quality, wastewater reduction, potable water testing/reporting and storm-water management.

Water is one of our most precious and valuable resources. Without it, life would not exist. Plants and animals need a reliable supply, and it is critical to many processes in growing crops.

The planning, management, and use of water requires the development of new approaches to render water sustainability and efficiency paramount. Water policymakers at all levels are looking at the risks of climate change. The 2003 California Water Plan acknowledged this issue and there is other research and legislation considering the effects of global warming on water supply. A reevaluation of the importance of water-use efficiency and conservation can lead to fundamental changes in water policy in the United States and globally. Conservation, efficiency and community-scale infrastructure can bring clean water to many people while helping to protect resources.

Improving efficiency and conservation can be the most economically, politically and environmentally responsible way to increase supply and save for the future. Climate change, aging infrastructure, watershed changes, chemical pollution and population growth all threaten water supplies.

Water conservation and education should be the main focus of any water sustainability efforts. The protection of fresh water sources, including both above surface water sources and ground water aquifers, is essential for sustainable water use. Efficient home construction, wise land use planning, reduction in water waste, and community planning can all reduce costs, stresses on natural resources, and help maintain quality of life. Adequate community education and design can significantly reduce water consumption. Efforts in resource management, such as conservation, water efficient homes and landscaping, and water banking can help alleviate some of the stresses on the water supply.

The environmental health professional can promote water conservation, wastewater management and ensuring clean water supplies by 1) educating ourselves on the available treatment and conservation opportunities and processes available to industry, 2) educating facilities, 3) using and promoting local success stories and, 4) the implementation of relevant laws, acts and regulations.

Sustainability and Agriculture/Food/Landscaping

Sustainability in the arenas of agriculture, food and landscaping includes consideration of consumer health and safety and maintaining or improving land and natural resources. For example, sustainable agriculture addresses environmental and social concerns and offers

economically viable opportunities for a variety of groups including growers, policymakers and consumers.

Food and agricultural sustainability is hampered by issues of water quality and usage, soil erosion, irrigation management, contamination of groundwater by pesticides, herbicides nitrates and selenium. Irrigation management means improving water conservation and storage measures, using reduced-volume irrigation systems, or not planting at all. Mandates for water conservation are being instituted by many municipalities. Sustainable landscaping involves the reduction or prevention of water runoff from hardscapes into storm sewers which empty to rivers, streams, lakes and oceans.

Organic food is produced by farmers who emphasize the use of renewable resources and the conservation of soil and water to enhance environmental quality for future generations. Organic meat, poultry, eggs and dairy products come from animals that have not been given hormones or antibiotics. Organic fruits and vegetables have been grown with limited use of pesticides or ionizing radiation. A government-approved certifier inspects the locations where the food is grown/produced to ensure that the grower is following the rules and regulations required to meet USDA standards. Companies that handle or process organic foods must also be inspected and certified before sending their products to markets or restaurants.

Environmental health professionals ("EHPs") are important resources for sustainability and how it relates to agriculture, food and landscaping. EHPs are involved in groundwater protection and investigations; in storm-water runoff prevention programs; and in the proper handling, storage and disposal of chemicals. The chemicals regulated by EHPs may include pesticides, herbicides and metal-containing materials and wastes. EHPs are heavily involved in food warehouse, food processing and restaurant facility inspections, and consumer safety issues. EHPs can be important resources for educating the public about chemical reduction practices, conserving resources, pollution prevention and providing websites for additional information regarding sustainability and the "greening" of businesses, residences and the community in general.

Waste Management and Sustainability

To achieve true sustainability in general, many organizations are employing an approach comprised of the following three aspects:

- Social – to recognize the needs of every person
- Economic – to maintain stable levels of economic growth and employment
- Environment – to use natural resources wisely and to protect the environment

When most people think of sustainability, often the environment comes to mind and the three "Rs": Reduce, Reuse and Recycle. Solid waste is a problem for individuals, companies and the country; therefore, the social, economic and environmental aspects of solid waste planning and sustainability must be addressed when considering solid waste reduction planning.

The overall goal of urban solid waste management is to collect, treat and dispose of solid wastes generated by all urban population groups in an environmentally and socially satisfactory manner using the most economical means available. Local governments are usually authorized to have

responsibility for providing solid waste management services, and most local government laws give them exclusive ownership over waste once it has been placed outside a home or business for collection. As cities experience economic growth, business activity and consumption patterns drive up solid waste quantities. At the same time, increased traffic congestion adversely affects the productivity of the solid waste fleet. These are challenges that require attention.

An Integrated Waste Management ("IWM") model looks at the life cycle of municipal solid waste, from the moment it becomes waste until it ceases to be waste by becoming a useful product, residual landfill material or an emission to air or water. The inputs for an IWM system are waste, energy and other raw materials. The outputs from the system are useful products in the form of reclaimed materials, compost, emissions to air and water and residual landfill material. Effective models need the flexibility to design, adapt and operate IWM systems in ways which best meet current social, economic and environmental conditions. These can change over time and vary by geography.

Environmental health professionals can assist businesses by educating them about the practicality and money-saving potential of the 3 Rs. For instance, a business can request information from its material suppliers to determine if the material currently in use can be replaced by alternative materials and how best to re-use or extend the life of the material. A business can research how to package wastes so as to make them non-hazardous, thereby reducing the quantity of hazardous waste generated. The local health department may also have ideas about how to recycle materials. Local health departments can regulate waste haulers, can promote zero-waste goals for certain types of businesses, recommend re-use of construction/demolition waste, and promote material purchasing and reuse policies.

Urban Design

Those involved with urban design are typically urban planning individuals. They look at a proposed development or land use with respect to specific criteria applicable to that type of use. For example, a new subdivision would include evaluation of the necessary utilities (sewer, water, gas, etc.), infrastructure (roads, lighting, fire protection, etc.), and recreational areas (parks, playgrounds, etc.).

It is becoming more common across the country for communities to use HIA's or Health Impact Assessments when new development is proposed. A HIA is used to evaluate objectively the potential health effects of a project or policy before it is built or implemented. HIA's are often done with public and/or environmental health input and can provide recommendations to increase positive health outcomes and minimize adverse health outcomes. The HIA framework is used to predict potential public health impacts on new development. Use of HIA's have been used to show the need for walkable communities, less paved development, mixed use developments, and other sustainable development practices around the world.

Although environmental health has not played a major role in past urban design evaluations, planners and developers are starting to relish the environmental public health input on land uses that can or will have environmental and health impacts such as community design, landfills, hazardous material facilities, rural wastewater disposal and other development that impact the human environment.

The design of neighborhoods and facilities can have an impact on the sustainability of the area, and should be reviewed by the environmental health professional with that in mind. In addition to addressing the environmental and health issues (water pollution, air pollution, etc,); an environmental health review may also include a review of sustainable practices in a neighborhood or facility within a development. Sustainable practices in neighborhoods may include: covenants to encourage xeroscaping to reduce water use, collection sites for recyclables when a community lacks curbside recycling or even treatment and reuse of wastewater in rural developments. Sustainable practices in facilities for facilities may include: recycling, waste to energy generation and fuel efficiency of equipment utilized in the operation. In addition, long-range after closure use of the site should take into consideration sustainable practices consistent with the type of operation.

Built Environment

For the most part, environmental health activities regarding sustainability in the built environment mainly occur when an issue has been discovered that impacts the health of an individual or individuals. These issues are often associated with indoor air quality (IAQ); however, they can also be associated with other concerns such as lighting and heating, ventilation, and air conditioning (HVAC).

Most of the IAQ concerns are related to fumes and vapors given off by equipment and furnishings. For example, in an office environment, IAQ issues could result from vapors associated with office equipment (i.e.: printing equipment), carpets, and other furnishings. These same concerns could be applicable in a home environment as well.
Environmental health professionals can identify the cause of such concerns, and provide options on ways to mitigate the problem.

In addition, owners of facilities, whether commercial or residential, can initiate their own sustainability practices that can include the following:

- The installation of "cool roof" systems, as well as other systems designed to minimize energy consumption.
- The use of low volatile organic compound (VOC)-containing furnishings, such as recycled carpets, equipment, etc.
- Waste reduction activities, including recycling, reuse, and waste minimization.
- Installation of compact fluorescent light bulbs.
- The use of "green" cleaning compounds.
- Diminish the use of automobiles by creating a built environment that is pedestrian and biker friendly, and by having local markets and shops to reduce the need to use a car.

Climate Change

Climate change is often used interchangeably with the term global warming. Although closely related, these terms, and the issues they represent are different. *Global warming* is defined as the increase in Earth's average surface temperature due to rising levels of greenhouse gases. Climate

change is defined as a long-term change in the Earth's climate, or of a region on Earth. But temperature change itself isn't the most severe effect of changing climate. Changes to precipitation patterns and sea level are likely to have much greater human impact than the higher temperatures alone. For this reason, "global climate change" is the more scientifically accurate term.

Many greenhouse gases occur naturally in the atmosphere, such as carbon dioxide, methane, water vapor, and nitrous oxide, while others are synthetic. Those that are man-made include the chlorofluorocarbons (CFCs), hydrofluorocarbons (HFCs) and Perfluorocarbons (PFCs), as well as sulfur hexafluoride (SF_6). Atmospheric concentrations of both the natural and man-made gases have been rising over the last few centuries. As the global population has increased and our reliance on fossil fuels (such as coal, oil and natural gas) has solidified, emissions of these gases have risen. While gases such as carbon dioxide occur naturally in the atmosphere, through our interference with the carbon cycle (through burning forest lands, or mining and burning coal), we artificially move carbon from solid storage to its gaseous state, thereby increasing atmospheric concentrations.

Environmental health plays an important role in humanity's attempt to reduce the health effects associated with greenhouse gases specifically, and air pollution in general. Many of the activities associated with this role include promulgating regulations, reviewing air pollution reduction plans for commercial operations, conducting inspections and investigations, emission testing for vehicles, and enforcement actions against non-compliant facilities.

In addition, there are a number of other sustainability-related activities that environmental health professionals can utilize in their activities. These include:

- Promoting and utilizing mass transit as an alternative to driving.
- Promoting and utilizing alternative transportation such as biking or walking.
- The use of hybrid or other "alternative fuel" vehicles.
- Wood burning bans during periods of poor air quality.

Sustainability in Regulations

Sustainability is usually more successfully accomplished through voluntary efforts, rather than by mandate. For example, if a source is in the process of a non-compliance settlement and is given a penalty reduction for conducting an Environmental Management System, the source might not conduct the analysis and think through the possibilities in an effort to finalize the enforcement action as carefully and thoughtfully as it might have if it undertook that same process on a voluntary basis. In the meantime more and more complex environmental regulations are being promulgated, and the question becomes how to incorporate options within the environmental regulatory framework to support companies' sustainability efforts, now and into the future.

To this extent, there are opportunities to incorporate incentives in regulations to support sustainability now and into the future. The onerous nature of a regulation is an obvious incentive to sources, in that sources may take steps to avoid triggering the requirements altogether by investigating pollution prevention and ultimately sustainable options. For example, a painting operation might switch from oil-based paints to low-VOC paints and no longer be subject to regulations for air quality, waste disposal, and fire safety. Providing time and other flexibilities in the prescribed compliance demonstration and schedule of a regulation to allow sources to

investigate and pilot these options is another example of how to incorporate incentives to support sustainability in regulations. This may be accomplished by providing ample lead time between the regulation's promulgation and compliance dates, or by providing reduced recordkeeping and/or reporting schedules for sources to reduce pollution sooner. For example – sources using new emission reduction technologies are allowed 3 years to come into compliance, whereas other sources not using these technologies need to comply within 1 year. Providing flexibility in the compliance mechanism is another example. By simply requiring an end result be achieved and not being prescriptive in what measures must be taken to achieve the end result promotes innovation and possibly sustainability. An example might include using a closed-loop system to capture emissions and reuse them in the process, rather than combusting or venting them. Finally, allowing sources to opt out if already subject to a regulation, upon making necessary choices to reduce pollution, is yet another way to promote sustainability. Providing some regulatory relief for sources who no longer generate pollution or generate the same amount of pollution is an incentive in and of itself. By providing these and other incentives, a source might be driven or incentivized to investigate sustainability options.

As mentioned earlier, sustainability is almost impossible to mandate, either by regulation or other legal means. First, the major environmental acts provide little to no authority to mandate beyond compliance, which includes sustainable efforts. Second, mandating beyond compliance simply resets the compliance standard, as it no longer is voluntary. Third, a mandate may actually hinder the voluntary nature behind sustainable efforts – a company may be more likely to investigate sustainable efforts on its own volition than have it mandated. Sustainability really needs support and buy-in from all levels in a business, especially management because this ensures its long term success. Sustainability needs to be driven from within an organization. All levels need to contribute their knowledge to the success of the program.

While sustainability is not something that can be mandated, there are ways to support companies' sustainability efforts, now and into the future in a regulatory framework.

NEHA Planning Guide for Sustainable Eco-Communities

Now that we have defined the many sustainability issues and definitions related to Environmental Health, the following is designed to guide a community through the stages and steps to develop and implement a sustainability program.

Eco-Municipality

Many communities in the United States and around the world have initiated and are carrying out sustainable programs. Green building programs, affordable housing, open space preservation, recycling, climate change initiatives, ecosystem health, public education and communication, transportation, energy efficiency and smart growth initiatives, are just a few of these. However, these efforts, as creditable as they are, are unconnected and un-integrated throughout municipal governments and larger communities.

In contrast to this disconnected approach to sustainability, the eco-municipality model uses a systems approach. Key elements of this systems approach as community awareness-raising and integrated municipal involvement founded on shared visions and goals to reorient their practices to sustainable directions.

An eco-municipality seeks to develop an ecologically, economically, and socially healthy community for the long term, using a step framework for sustainability as a guide for a highly participative planning process as the method. An eco-municipality becomes the driving force for involving citizens and the larger community in the change process toward becoming a sustainable community. An eco-municipality collaborates with other communities regionally, nationally, and internationally both to learn from others and assist other in their change processes.

Guiding Strategy for Planning for Sustainability

Planning for sustainability requires a systematic, integrated approach that brings together environmental, economic and social goals and actions directed toward the following four objectives

1. Reduce dependence upon fossil fuels, extracted underground metals and minerals. Reason: Unchecked, increases of such substances in natural systems will eventually cause concentrations to reach limits – as yet unknown – at which irreversible changes for human health and the environment will occur and life as we know it may not be possible.
2. Reduce dependence on chemicals and other manufactured substances that can accumulate in Nature. Reason: Same as before.
3. Reduce dependence on activities that harm life-sustaining ecosystems. Reason: The health and prosperity of humans, communities, and the Earth depend upon the capacity of Nature and its ecosystems to re-concentrate and restructure wastes into new resources.
4. Meet the hierarchy of present and future human needs fairly and efficiently. Reason: Fair and efficient use of resources in meeting human needs is necessary to achieve social stability and achieve cooperation for achieving the goals of the first three guiding policies.

Planning Actions Toward Sustainability

Citizens, local institutions, and organizations can be invited to submit implementing agreements to be included in the strategic action plan. A strategic action plan can be seen as a framework document to which the specific action commitments of different institutions or stakeholders can be attached. The framework document is a consensus document, developed by stakeholders, which is

used to guide its signatories in developing their own implementation plans. The action plan document would therefore contain:

- A community vision, developed by the stakeholders, including a position on current problems and opportunities;
- A strategic goal for each problem or opportunity area related to this vision;
- Specific targets to be achieved in meeting each;
- Identified implementation strategies and programs for achieving these targets and goals;
- A description or key partnerships to be established for implementation, including linkages with existing planning processes; and
- A framework for periodic evaluation of progress, including "triggers" for future planning and action.

Once this document is prepared and agreed upon by stakeholders, citizens, local institutions, organizations, and agencies can be invited to submit implementing agreements, to be recognized and included as an appendix to the strategic action plan document. The municipality would be the first institution expected to outline its specific implementation plans and programs.

Implementing agreements will include:

- Specific program commitments of government departments, service agencies, private corporations, non-governmental organizations, etc.
- Agreements among different stakeholders to undertake joint work; and
- Commitments by individuals, households, neighborhoods, schools, private businesses, and so forth, to improve their performance in relation to the community's sustainability goals.

These different implementing agreements are incorporated into the strategic action plan as an appendix, and estimates are made of how each agreement will impact upon the achievement of the plan's overall goals and targets. In this way, the strategic action plan is used as a dynamic document to encourage and focus the efforts of individual residents and institutions to achieve the strategic goals of the community.

<u>Examples of Specific Planning Actions Toward Sustainability</u>

Examples of strategies can be employed as a framework to systematically generate a comprehensive approach of specific planning actions toward sustainability. The appropriateness of a specific action (e.g.: reduce fossil fuels) will vary from community to community and region to region, as well as from level to level of governmental responsibility. Hence, the best planning approach may be for communities and agencies themselves to generate a planning and policy agenda toward sustainability, using the four guiding strategies as a framework in a participatory planning process.

I. Land use actions toward sustainability:

A. Reduced dependence upon fossil fuels, underground metals, and minerals by promoting:

1. Compact development that minimizes the need to drive
2. A mix of integrated community uses — housing, shops, workplaces, schools, parks, civic facilities — within walking or bicycling distance
3. Human-scaled development that is pedestrian-friendly

4. Development oriented around public transit
5. Home-based occupations and work that reduce the need to commute
6. Local food production and agriculture that reduces need for long-range transport of food.

B. Reduction of activities that encroach upon nature through:

1. Guiding development to existing developed areas and minimizing development in outlying, undeveloped areas
2. Maintaining a well-defined "edge" around each community that is permanently protected from development
3. Remediation and redevelopment of brownfield sites and other developed lands that suffer from environmental or other constraints
4. Promote regional and local designs that respect the regional ecosystems and natural functions, which support human communities.
5. Creation of financial and regulatory incentives for infill development; elimination of disincentives

1. C. Meeting human needs fairly and efficiently byeliminating disproportionate environmental burdens and pollution experienced by historically disadvantaged communities.

II. Transportation actions toward sustainability:

A. Reduced dependence upon fossil fuels through:

1. Reduction in vehicle trips and vehicle miles traveled through compact, infill, and mixed use development
2. Use of alternatives to the drive-alone automobile, including walking, bicycling, and public transit
3. Development and use of vehicles powered by renewable fuel sources
4. Local street designs that encourage pedestrian and bicycle use and discourage high speed traffic
5. Street designs that support/enhance access between neighborhoods and to neighborhood-based commercial developments.

B. Meeting human needs fairly and efficiently, by:

1. Providing affordable, efficient transportation alternatives for everyone, especially low-income households, elders, and others, which comprise 30% of the national population that cannot or do not own cars.

III. Housing and building actions toward sustainability:

A. Reduced dependence upon fossil fuels, extracted underground metals, and minerals through:

1. Solar and wind-oriented design of development
2. Use of regenerative energy heating and cooling source alternatives to fossil fuels
3. Provision of housing near places of employment

4. Selection of building materials with low "embodied energy," which require less energy-intensive production methods and long-distance transport

B. Reduced dependence upon chemicals and unnatural substances through:

1. Use of chemical-free and toxic-free building materials
2. Reduction of waste and recycling of building waste materials and promoting recycling by residents
3. Landscape design standards that minimize the use of pesticides and herbicides

C. Reduction of activities that encroach upon nature, through:

1. Reuse of existing buildings and sites for development
2. Compact and clustered residential development, including reduced minimum lot sizes
3. Removal of code obstacles to using recycled materials for building
4. Water conservation measures, to minimize environmentally destructive side effects of developing new water sources
5. Responsible stormwater management that reuses and restores the quality of on-site run-off — (e.g.: constructed marsh or wetlands systems).
6. Reduction or elimination of impervious paving materials
7. Use of recycled building materials, helping to minimize the mining of virgin materials
8. Use of "cradle-to grave" (life cycle) analysis in decision-making for materials and construction techniques.
9. Recycling of building construction waste materials and appropriate deconstruction techniques.

D. Meeting human needs fairly and efficiently, by providing for:

1. Communities and housing developments that are socially cohesive, reduce isolation, foster community spirit, and sharing of resources (e.g.: cohousing)
2. Housing that is affordable to a variety of income groups within the same community
3. A diversity of occupants in terms of age, social, and cultural groups
4. Housing located near employment centers.

IV. Economic development actions toward sustainability

A. Encourage businesses that reduce dependence upon fossil fuels, extracted underground metals, and minerals; for example, businesses that:

1. Reduce employee and product transport vehicle trips
2. Use regenerative energy alternatives to fossil fuel, or that are working to reduce dependence on fossil fuel
3. Do not use or are reducing use of cadmium, lead, and other potentially toxic metals and minerals that can accumulate in the biosphere.
4. Are locally based or home-based, reducing or eliminating the need to commute.

B. Encourage businesses that reduce dependence upon chemicals and unnatural substances; for example, enterprises that:

1. Actively seek ways to minimize the use of toxic manufactured substances
2. Meet or exceed clean air standards
3. Minimize or reduce use of chemicals and employ proper disposal and recycling mechanisms for these
4. Use agricultural methods that reduce or minimize use of pesticides, herbicides, and manufactured fertilizers
5. Use byproducts of other processes or whose wastes can be used as the raw materials for other industrial processes

C. Encourage businesses that reduce activities that encroach upon nature; for example, enterprises that:

1. Use recycled or by-products of other businesses, minimizing the use of virgin raw materials
2. Prevent activities that emit waste or pollutants into the environment
3. Use agricultural approaches that build up rather than deplete topsoil, and conserve or minimize water use
4. Maintain natural terrain, drainage, and vegetation, minimizing disruption of natural systems
5. Re-use processed water.

D. Encourage businesses that meet human needs fairly and efficiently; for example, enterprises that:

1. Fulfill local employment and consumer needs without degrading the environment
2. Promote financial and social equity in the workplace
3. Create vibrant community-based economies with employment opportunities that allow people economic self-determination and environmental health
4. Encourage locally-based agriculture, such as community supported agriculture, providing a nearby source of fresh, healthy food for urban and rural populations

V. Open space/recreation actions toward sustainability

A. Reduced dependence upon fossil fuels, extracted underground metals, minerals, by:

1. Providing recreational facilities within walking and bicycling distance
2. Using local materials and native plants in facility design to reduce transport distances and reduce maintenance
3. Landscape and park maintenance minimizing use of equipment powered by fossil fuels

B. Reduced dependence upon chemicals and synthetic substances; for example by using

1. alternatives to chemical pesticides and herbicides in park and facility maintenance (example.g.: integrated pest management)

C. Activities that reduce encroachment upon nature, such as:

1. Funding for open space acquisition
2. Preservation of wilderness areas
3. Urban gardens, community gardens

4. Preservation of wildlife habitats and biological diversity of area ecosystems
5. On-site composting of organic waste
6. Restoration of damaged natural systems through regenerative design approaches
7. Creation of systems of green spaces within and among communities
8. Development of responsible alternatives to landfills for disposal of solid waste
9. Using regionally native plants for landscaping
10. Encouraging landscape and park maintenance that reduce the use of mowers, edgers, and leaf blowers

VI. Infrastructure actions toward sustainability:

1. A. Reduced dependence upon fossil fuels, extracted underground metals, minerals, by promoting facilities that employ renewable energy sources, or reduce use of fossil fuel for their operations and transport needs

B. Reduced dependence upon chemicals and synthetic substances, by promoting:

1. Treatment facilities that remove or destroy pathogens without creating chemically-contaminated byproducts
2. Design approaches and regulatory systems that focus on pollution prevention, re-use and recycling.

C. Reduction of activities that encroach upon nature, through:

1. Promotion of innovative sewage and septic treatment that discharges effluent meeting or exceeding federal drinking water standards while minimizing or eliminating the use of chemicals (example: greenhouse sewage treatment facilities)
2. Recognition of the "cradle to grave" costs of waste generation and disposal
3. Promotion of and removal of regulatory barriers to composting and graywater reuse systems

1. D. Meeting human needs fairly and efficiently, by cleaning, conserving, and reusing wastewater at the site, neighborhood or community level, reducing the need for large, expensive collection systems and regional processing facilities

VII. Growth Management Actions toward sustainability:

1. A. Reduced dependence upon fossil fuels, extracted underground metals, minerals, by promotingdevelopment near existing transport systems; minimizing need for new road and highway construction

B. Reduction of activities that encroach upon nature, by promoting:

1. Appropriate development and population growth policies linked to carrying capacity of natural systems and community facilities
2. Development patterns that respect natural systems such as watersheds and wildlife corridors.

1. C. Meeting human needs fairly and efficiently, by promotingfair and equitable growth management policies maintaining diversity in local populations and economies

VIII. Floodplain Management Actions toward sustainability

A. Reduction of activities that encroach upon nature, by:

1. Guiding development away from floodplains
2. Guiding development away from barrier beaches
3. Preserving or restoring wetland areas along rivers for natural flood control

VIX. Watershed Planning/Management Actions toward sustainability

A. Reduction of activities that encroach upon nature, such as:

1. Preservation and enhancement of water quality
2. Reduction in water use
3. Recharge of groundwater basins
4. Use of flood control and stormwater techniques that enhance and restore natural habitats
5. Prevention of wetlands destruction; restoration of degraded wetlands

X. Resource Conservation Actions toward sustainability:

A. Reduced dependence upon fossil fuels, extracted underground metals, and minerals, by:

1. Minimizing energy use
2. Encouraging the development of renewable energy sources
3. Discouraging the use of products that utilize packaging derived from non-renewable, non-degradable resources
4. Promoting the recycling of waste materials derived from non-renewable, non-degradable resources.
5. Developing community gardens that reduce the need for long-range transport of food and associated consumption of fossil fuels.

1. B. Reduction of activities that encroach upon nature. For examplepromoting the preservation and planting of trees and other vegetation that absorb carbon dioxide and air pollutants

XI. Planning Processes/Education Actions toward sustainability:

1. A. Support activities that reduce dependence upon fossil fuels, extracted underground metals, and minerals. For example, encouraging and enabling people to use transportation other than gasoline-powered vehicles

1. B. Support activities that reduce dependence upon chemicals and unnatural substances. For example, educating citizens and public servants about both short- and long-term risks associated with the use and disposal of hazardous materials

1. C. Support activities that reduce encroachment upon nature. For example, educational efforts to reduce levels of consumption and waste generation at the household and community levels

D. Support meeting human needs fairly and efficiently by:

1. Integrally involving local community residents in setting the vision for and developing plans for their communities and regions
2. Establishing avenues for meaningful participation in decision-making for all citizens and in particular for historically disadvantaged people
3. Providing for equitable educational opportunities for all members of society
4. Promoting retraining of those displaced in the short-term by a shift to a more sustainable economy

Implementation and Monitoring

An excellent action plan provides no guarantee that problems will be solved, that needs will be met, or that the life of the community will become more sustainable. Indeed, one of the major hurdles that a local government may encounter in establishing a planning process is skepticism that residents and service users may feel toward more planning and more plans.

The failure of local governments to actually implement plans is often attributed to a lack of will on the part of government institutions and officials. However, poor performance just as often results from a shortsighted planning approach that conceives of the ultimate product as a plan rather than institutional reform and action. A successful planning process must directly address the practical requirements of implementation.

The successful implementation of a strategic action plan requires two primary activities:

1. The stakeholders who researched and developed the plan must transform the organizational structures that they used for planning into organizational structures that have specific responsibilities and capabilities for implementation.
2. The local government must integrate the proposals and targets of the stakeholders' action plan into its own practices, including it budgetary priorities and investment decisions. Mobilizing the local government is essential to implementation, as it is typical for volunteer stakeholder participants to reduce their time investment following an extensive community-based planning effort – just as the critical implementation phase begins.

There are five key components to an effective joint implementation strategy between a local government and its external stakeholders;

- The creation of new structures or the reform of existing structures to support implementation partnerships;
- The establishment of a working linkage between the stakeholders' action plan and local statutory planning requirements;
- The review of existing municipal policies, budgetary priorities, and internal practices and procedures to test their compatibility with the action plan;

- The monitoring of new or future municipal policies, decisions, or actions to assure their consistency with the action plan; and
- The documentation of actions, both by stakeholders and by the municipality, to implement the plan.

CREATING EFFECTIVE STRUCTURES

An action plan is only as good as the structures put in place to implement it. The fiscal, technological, and political constraints on governments may make it impossible for public sector institutions to fulfill their traditional functions at all.

The first step in implementing an action plan should therefore be to ask the following questions:

- What reforms in jurisdiction or mechanisms for inter-jurisdictional cooperation are required to implement new programs and to enforce the proposed policies?
- How must structures be decentralized so that they can focus on community needs and facilitate the continued participation of stakeholders in the implementation of action plans?
- What structures must be put in place to assure that the responsible municipal staff from different departments can coordinate their activities with one another?
- What new institutions, established outside the municipal corporation, are necessary to implement proposed programs?

Once people are engaged in the details of implementing a plan, they can easily lose sight of the overarching purpose for planning in the first place: to make the community sustainable. Making progress towards sustainability requires systematic evaluation of whether the plan's action strategies are adequate and whether they are having the desired effects. Periodically, the Stakeholder Group, the municipality, and local residents will need to explore this fundamental question and share information about local, regional, and global conditions so that new actions can be devised to achieve their Community Vision.

There are four key components to an effective evaluation process. These are:

- the establishment of a system whereby all the key stakeholders report to each other on the actions they have taken to implement the Action Plan;

- the development of methods and tools, such as indicators, to measure the performance of the community as a whole in achieving its goals and targets, and to determine whether any "trigger" conditions have been reached, requiring further planning or action;

- the implementation of a comprehensive analysis and review, on a periodic basis, of local, regional, and global conditions and an analysis as to whether these conditions indicate progress towards actually achieving sustainability and the Community Vision; and

- the establishment of mechanisms for reporting on progress and performance to local inhabitants and their community organizations, so that they continue to be informed and guide their own behaviors in a way that is consistent with the goal of sustainable development.

REPORTING

An effective reporting system must address two related but distinct needs. The first is reporting on the performance of stakeholders and local institutions in achieving the goals, commitments, and targets established in the Action Plan. The second is reporting on whether this performance is resulting in community progress towards the Community Vision and sustainability. These two issues are distinct, and should be separately evaluated, as it can never be assumed that the commitments and targets established in an Action Plan will in fact be accurate, adequate, and/or sufficient to meet the real and complex challenge of sustainability in a rapidly changing world.

Create distinct reporting procedures for evaluating performance vis-a-vis the Action Plan and progress towards sustainability.

PERFORMANCE REPORTING

Performance reporting focuses on the actions being taken to achieve the overall goals and the specific targets established in the Action Plan.

The establishment of an internal management system within the municipal corporation (5.3.3) should produce sufficient documentation and internal reporting on municipal actions to implement the plan. The major challenge in a community-based reporting process will be to get all the major stakeholders and institutions in a community to report on their actions in a candid, consistent, and regular way. Community-wide performance reporting requires, in effect, the establishment of a system of accountability among all the major actors and sectors: large institutions, businesses, government, key interest groups, and individual households. This approach is considerably different than the traditional one-way process in which business reports to government, government reports to the community, but residents and their organizations do not report back to either.

Institute a multi-stakeholder "accountability" system for regular reporting of each sector's performance to implement the Action Plan and for the periodic joint review of the Action Plan.

An ideal community-based reporting system would accomplish the following:

- Provide a schedule and guidelines for all actors to report to each other. The best guidelines would assure that reports from different parties could be aggregated to determine the joint progress being made to achieve a specific target.

- Establish a set of indicators to measure performance in achieving targets. (The reporting system should provide the Stakeholder Group or municipal planners with the data needed to determine the present values of these indicators.)

- Provide a periodic opportunity for all actors to meet together to review each other's performances relative to their commitments and targets, and to discuss how to better coordinate their actions.

- Provide an opportunity to expose local residents to the different projects and campaigns being implemented, and to inform them about how they can participate.

- Link the performance reporting process to relevant statutory planning cycles of the municipality, such as annual budgeting, so that the municipality can adjust its plans based on the actions taken by other sectors.

The effectiveness of a Local Action Plan will largely depend on the quality of the planning process used to create it. Therefore, it will help to periodically review and reflect on local planning efforts to ensure that Local Action planning is:

- systematically involving all major community groups such as different ethnic, gender, income and age groups, in all stages of planning, implementation, monitoring and evaluation of the local Action Plan;

- creating awareness and commitment in households, neighborhoods and communities so that decisions and choices made at these levels do not contradict sustainability;

- involving all relevant municipal departments and agencies in the process, and is creating linkages between the ongoing statutory planning activities and the local Action Plan;

- creating a network of informed and committed partners to examine the systemic causes of problem issues from social, economic and environmental perspectives;

- meeting immediate, priority needs in the short-term and is making steady progress to address the long-term threats to local sustainability; and

- developing concrete targets and commitments to achieve measurable performance for sustainable development.

Finally, the process is a means for creating strong and self-reliant communities that will collectively create a sustainable community. To appreciate and recognize your individual contribution in making an impact at the global level, it also will be necessary to create local management and information systems to monitor and record your performance.

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http://www.cdc.gov/healthyplaces/hia.htm

http://www.who.int/hia/en/

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During the keynote, at NEHA's 2009 AEC & Exhibition, CDC's Dr. Howard Frumkin will make the case for environmental health's involvement in sustainability and prolonging climate change. See page 7-12 for details.

Addressing Climate Change and Local Public Health: The Austin Climate Protection Program and the CDC Working Group on Climate Change Collaboration

Editor's note: NEHA strives to provide up-to-date and relevant information on environmental health and to build partnerships in the profession. In pursuit of these goals, we feature a column from the Environmental Health Services Branch (EHSB) of the Centers for Disease Control and Prevention (CDC) in every issue of the Journal.

In this column, EHSB and guest authors from across CDC will highlight a variety of concerns, opportunities, challenges, and successes that we all share in environmental public health. EHSB's objective is to strengthen the role of state, local, and national environmental health programs and professionals to anticipate, identify, and respond to adverse environmental exposures and the consequences of these exposures for human health. The services being developed through EHSB include access to topical, relevant, and scientific information; consultation; and assistance to environmental health specialists, sanitarians, and environmental health professionals and practitioners.

The authors are from TKC Integrated Service Consulting (Natasha Prudent), the Centers for Disease Control and Prevention (Maggie Byrne and George Luber), Adele Houghton Consulting (Adele Houghton, who is an Environmental Public Health Leadership Institute Fellow), and the Austin Climate Protection Program (Jake Stewart, Alexander [Sascha] Petersen, and Rachel Thompson).

The conclusions in this article are those of the authors and do not necessarily represent the views of CDC.

In the December 2007 issue of the *Journal*, scientists from the Centers for Disease Control and Prevention (CDC) framed the public health impacts of climate change (Luber & Hess, 2007). They noted that costly catastrophic weather events (Greenough et al., 2001) and vectorborne-disease outbreaks (Gage, Burkot, Eisen, & Hayes, 2008; Greenough et al., 2001; Gubler et al., 2001; Patz, Vavrus, Uejio, & McLellan, 2008) are expected to become more frequent, widespread, and lengthy. The potential health effects of extreme heat (Luber & McGeehin, 2008), respiratory diseases (Kinney, 2008), injuries from extreme weather events (Greenough et al., 2001), and adverse mental health impacts (Balbus & Wilson, 2000) are also of concern. Climate change will threaten traditional public health infrastructure. It will stress environmental health services, such as efforts to respond to severe weather events and disease outbreaks, provide assurance of drinking water safety, and implement vector control measures.

As the reality of climate change becomes apparent, many government entities are taking proactive measures. These measures are broadly defined by two aspects: greenhouse gas emissions reduction (mitigation) and reducing the harm associated with climate change impacts (adaptation) (Frumkin & McMichael, 2008). Mitigation initiatives such as the Cities for Climate Protection (CCP) campaign, sponsored by the International Council for Local Environmental Initiatives (ICLEI, 2008), have developed five milestones in addressing climate change. Participating cities must do the following:

1. conduct a baseline emissions inventory and forecast,
2. adopt an emissions reduction target for the forecast year,
3. develop a local action plan,
4. implement policies and measures, and
5. monitor and verify results.

As cities tackle climate change and its threat to local infrastructure, efforts linked to mitigation as well as adaptation present opportunities (Frumkin & McMichael, 2008) for co-benefits in public health. For example, traditional combined sewage overflow systems that experience heavy rainfall events may discharge contaminants into water bodies, resulting in increased incidence of waterborne diseases (Curriero, Patz, Rose, & Lele, 2001). As cities begin to upgrade sewage systems to reduce their carbon footprints under campaigns like CCP, a more resilient sewer infrastructure that will withstand extreme weather events is enhanced by the co-benefit of reducing incidence of waterborne diseases (Curriero, Patz, Rose, & Lele, 2001; Patz, Vavrus, Uejio, & McLellan, 2008).

The public health effects of climate change are influenced by dynamic interactions among environmental-climatic factors, biological systems, and human elements (Rose et al., 2000). With more than 100 U.S. cities participating in CCP, environmental health practitioners have opportunities to improve public health by integrating public health frameworks, such as the Ten Essential Public Health Services (Frumkin, Hess, Luber, Malilay, & McGeehin, 2008), with existing climate change programs. The framework outlines the following actions:

1. monitor the health status of the community,
2. investigate and diagnose health problems and hazards,
3. inform and educate people regarding health issues,
4. mobilize partnerships to solve community problems,
5. support policies and plans to achieve health goals,
6. enforce laws and regulations to protect health and safety,
7. link people to needed personal health services,
8. ensure a skilled, competent public health workforce,
9. evaluate effectiveness, accessibility, and quality of health services, and
10. research and apply innovative solutions.

In collaboration with the CDC Working Group on Climate Change, the city of Austin's Climate Protection Program (ACPP) is piloting an approach to linking public health and local climate change programs. This project was developed by a fellow in the CDC-sponsored Environmental Public Health Leadership Institute. The incorporation of public health data into evaluation criteria for local climate mitigation strategies is central to this approach. These metrics will take the form of indicators or composite measures of environmental hazards, health outcomes, vulnerability, and policy interventions.

The ACPP-CDC collaboration will incorporate environmental health indicators into Austin's climate plan on two scales: 1) to base projections for the public health impacts of not undertaking any climate change mitigation steps, and 2) to document overall local and regional public health outcomes associated with implementation. The program will use the National Environmental Health Indicators of Climate Change developed by the State Environmental Health Indicators Collaborative, a project of the Council of State and Territorial Epidemiologists.

Through existing structures such as the National Environmental Public Health Tracking Program, ACPP will access data and measures of environmental health status throughout local, state, and federal levels and expand to include measures of vulnerability and climate policy interventions relevant to Austin. The ACPP-CDC collaboration is an initial step in expanding a topic frequently viewed as one dimensional into a multidimensional program with implications far beyond reducing greenhouse gas emissions. ACPP will use the combined data to track progress of its climate mitigation strategies, set future priorities, and identify co-benefits in health among other Austin programs.

The efforts of the ACPP-CDC collaboration demonstrate the importance of "thinking globally while acting locally." Involving health in local climate change efforts can contribute to global efforts to reduce greenhouse emissions, while simultaneously improving the health of local residents. As more research, better surveillance, enhanced emergency response, and stronger mitigation policies are implemented, environmental health practitioners will form a vital part of a comprehensive response to climate change.

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For additional information, visit the following Web sites.

- Austin Climate Protection Program—City of Austin: www.coolaustin.org.
- Cities for Climate Protection Campaign—International Council for Local Environmental Initiatives: www.iclei.org/index.php?id=800.
- Climate Change and Public Health—CDC: www.cdc.gov/ClimateChange.
- Environmental Health Training in Emergency Response (free course)—CDC: www.cdc.gov/nceh/ehs/Resources/EHTER.htm.
- National Environmental Public Health Tracking Program—CDC: www.cdc.gov/nceh/tracking/.
- State Environmental Health Indicators Collaborative—Council of State and Territorial Epidemiologists: www.cste.org/environmentalhealth.asp.
- U.S. Conference of Mayors Climate Protection Center: www.usmayors.org/climateprotection.

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American Academy of Pediatrics ▪ American College of Occupational and Environmental Medicine ▪ American College of Preventive Medicine ▪ American Lung Association ▪ American Medical Association ▪ American Nurses Association ▪ American Public Health Association ▪ American Thoracic Society ▪ Association of State and Territorial Health Officials ▪ Children's Environmental Health Network ▪ Health Care without Harm ▪ Hepatitis Foundation International ▪ National Association of County and City Health Officials ▪ National Association of Local Boards of Health ▪ National Environmental Health Association ▪ Partnership for Prevention ▪ Physicians for Social Responsibility ▪ Trust for America's Health

September 28, 2010

The White House
Washington, DC 20500

The United States Senate
Washington, DC 20510

The United States House of Representatives
Washington, DC 20515

To President Obama, Members of the United State Senate and Members of the United States House of Representatives,

Climate change is a serious public health issue. As temperatures rise, more Americans will be exposed to conditions that can result in illness and death due to respiratory illness, heat- and weather-related stress and disease carried by insects. These health issues are likely to have the greatest impact on our most vulnerable communities, including children, older adults, those with serious health conditions and the most economically disadvantaged.

The latest assessment from the U.S. Global Change Research Program (USGCRP), the Global Climate Change Impacts in the U.S., states that "Climate change poses unique challenges to human health…. There are direct health impacts from heat waves and severe storms, ailments caused or exacerbated by air pollution and airborne allergens, and many climate-sensitive infectious diseases."

As public health professionals, we are writing to urge you to recognize the threat to public health posed by climate change and to support measures that will reduce these risks and strengthen the ability of our local, state and federal public health agencies to prepare for and respond to the impacts of climate change.

In order to prepare for changes already under way, it is essential to strengthen our public health system so it is able to protect our communities from the health effects of heat waves, wildfires, floods, droughts, infectious diseases, and other events. But we must also address the root of the problem, which means reducing the emissions that contribute to climate change. The US Environmental Protection Agency (EPA) is responsible for protecting the public's health from climate change, and we urge you to fully support the EPA in fulfilling its responsibilities. **We also urge opposition to any efforts to weaken, delay or block the EPA from protecting the public's health from these risks.**

To provide the most complete protection for Americans, Congress should resume efforts to pass clean energy and climate legislation that includes strong provisions to protect public health adequately and appropriately. If our organizations may be of further assistance, please contact Don Hoppert with the American Public Health Association at 202-777-2514.

Sincerely,

National organizations

American Academy of Pediatrics
American College of Occupational and Environmental Medicine
American College of Preventive Medicine
American Lung Association
American Medical Association
American Nurses Association
American Public Health Association
American Thoracic Society
Association of State and Territorial Health Officials
Children's Environmental Health Network
Health Care without Harm
Hepatitis Foundation International
National Association of County and City Health Officials
National Association of Local Boards of Health
National Environmental Health Association
Partnership for Prevention
Physicians for Social Responsibility
Trust for America's Health

State and local organizations and health professionals

Alaska
Alaska Public Health Association

Arizona
Arizona Physicians for Social Responsibility

California
California Public Health Association
North Sacramento Physicians for Social Responsibility
Los Angeles Physicians for Social Responsibility
San Francisco Physicians for Social Responsibility
Southern California Public Health Association

Colorado
Colorado Physicians for Social Responsibility

Connecticut
Association of School Nurses of Connecticut
Connecticut Public Health Association
Farmington Valley health district
Glastonbury Health Department

Delaware
American Lung Association of Delaware

Florida
Tampa Physicians for Social Responsibility
Florida Physicians for Social Responsibility

Georgia
Georgia Public Health Association

Hawaii
Hawaii Public Health Association

Iowa
Iowa Physicians for Social Responsibility
Iowa Public Health Association

Idaho
Idaho Public Health Association

Illinois
Autism Society of Illinois
Illinois Maternal and Child Health Coalition
Illinois Nurses Association
Illinois Public Health Association
Learning Disabilities Association of Illinois

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Washington
Washington Physicians for Social Responsibility
Washington State Public Health Association
Patricia Butterfield, RN, PhD, Professor WSU College of Nursing
Phyllis Eide, RN, PhD, Professor WSU College of Nursing

Wisconsin
Wisconsin Physicians for Social Responsibility
Wisconsin Public Health Association

American Academy of Pediatrics ▪ American College of Occupational and Environmental Medicine ▪ American College of Preventive Medicine ▪ American Lung Association ▪ American Medical Association ▪ American Nurses Association ▪ American Public Health Association ▪ American Thoracic Society ▪ Association of State and Territorial Health Officials ▪ Children's Environmental Health Network ▪ Health Care without Harm ▪ Hepatitis Foundation International ▪ National Association of County and City Health Officials ▪ National Association of Local Boards of Health ▪ National Environmental Health Association ▪ Partnership for Prevention ▪ Physicians for Social Responsibility ▪ Trust for America's Health

September 28, 2010

The White House
Washington, DC 20500

The United States Senate
Washington, DC 20510

The United States House of Representatives
Washington, DC 20515

To President Obama, Members of the United State Senate and Members of the United States House of Representatives,

Climate change is a serious public health issue. As temperatures rise, more Americans will be exposed to conditions that can result in illness and death due to respiratory illness, heat- and weather-related stress and disease carried by insects. These health issues are likely to have the greatest impact on our most vulnerable communities, including children, older adults, those with serious health conditions and the most economically disadvantaged.

The latest assessment from the U.S. Global Change Research Program (USGCRP), the Global Climate Change Impacts in the U.S., states that "Climate change poses unique challenges to human health…. There are direct health impacts from heat waves and severe storms, ailments caused or exacerbated by air pollution and airborne allergens, and many climate-sensitive infectious diseases."

As public health professionals, we are writing to urge you to recognize the threat to public health posed by climate change and to support measures that will reduce these risks and strengthen the ability of our local, state and federal public health agencies to prepare for and respond to the impacts of climate change.

In order to prepare for changes already under way, it is essential to strengthen our public health system so it is able to protect our communities from the health effects of heat waves, wildfires, floods, droughts, infectious diseases, and other events. But we must also address the root of the problem, which means reducing the emissions that contribute to climate change. The US Environmental Protection Agency (EPA) is responsible for protecting the public's health from climate change, and we urge you to fully support the EPA in fulfilling its responsibilities. **We also urge opposition to any efforts to weaken, delay or block the EPA from protecting the public's health from these risks.**

To provide the most complete protection for Americans, Congress should resume efforts to pass clean energy and climate legislation that includes strong provisions to protect public health adequately and appropriately. If our organizations may be of further assistance, please contact Don Hoppert with the American Public Health Association at 202-777-2514.

Sincerely,

National organizations

American Academy of Pediatrics
American College of Occupational and Environmental Medicine
American College of Preventive Medicine
American Lung Association
American Medical Association
American Nurses Association
American Public Health Association
American Thoracic Society
Association of State and Territorial Health Officials
Children's Environmental Health Network
Health Care without Harm
Hepatitis Foundation International
National Association of County and City Health Officials
National Association of Local Boards of Health
National Environmental Health Association
Partnership for Prevention
Physicians for Social Responsibility
Trust for America's Health

State and local organizations and health professionals

Alaska
Alaska Public Health Association

Arizona
Arizona Physicians for Social Responsibility

California
California Public Health Association
North Sacramento Physicians for Social Responsibility
Los Angeles Physicians for Social Responsibility
San Francisco Physicians for Social Responsibility
Southern California Public Health Association

Colorado
Colorado Physicians for Social Responsibility

Connecticut
Association of School Nurses of Connecticut
Connecticut Public Health Association
Farmington Valley health district
Glastonbury Health Department

Delaware
American Lung Association of Delaware

Florida
Tampa Physicians for Social Responsibility
Florida Physicians for Social Responsibility

Georgia
Georgia Public Health Association

Hawaii
Hawaii Public Health Association

Iowa
Iowa Physicians for Social Responsibility
Iowa Public Health Association

Idaho
Idaho Public Health Association

Illinois
Autism Society of Illinois
Illinois Maternal and Child Health Coalition
Illinois Nurses Association
Illinois Public Health Association
Learning Disabilities Association of Illinois

Respiratory Health Association of Metropolitan Chicago
Brynn Weimer, Physical Therapist

Indiana
Indiana Public Health Association

Kansas
Kansas Public Health Association
Physicians for Social Responsibility - Kansas City
Ann Suellentrop, MSRN

Massachusetts
Central Massachusetts Physicians for Social Responsibility
Pioneer Valley Physicians for Social Responsibility
Greater Boston Physicians for Social Responsibility
Paul R. Epstein, MD, MPH

Maryland
Maryland Public Health Association
Baltimore Physicians for Social Responsibility

Maine
Maine Physicians for Social Responsibility
Maine Public Health Association

Michigan
Ingham County Health Department
Michigan Public Health Association
Hal Morgenstern, Professor, Environmental Health Sciences, University of Michigan School of Public Health

Missouri
City of Kansas City, MO Health Department
Missouri Public Health Association
Leesa Hemkens, RN
Lorraine Kerksiek, Administrator
Melissa Sutton, Patient Technician, Boone Hospital Center
Rory Abberton, EMT-P
Sarah Hempkens, LPN

Montana
Andy Puckett, MD
Benjamin Schmidt, Air Quality Specialist
Beth Schenk, RN
Carolyn Goren, Physician (retired)
Georgia Milan, MD
Dr. Greg Lind,Physician
Dr. James Wiggins, Physician
John Beighle, MD
Marcia Hanks, APRN, CNM
Mary Huddle, APRN, CNM
Nancy Wiggins, Nurse Practitioner
Paul Gazzo, RN
Paul Loehnen, Physician (retired)
Sara Lahey, RN

North Carolina
Asthma Alliance of North Carolina
North Carolina Public Health Association
Western North Carolina Physicians for Social Responsibility

North Dakota
Barry Milavetz, PhD
Christie Iverson, MD
Herbert J. Wilson, MD
James B. Buhr, MD
Sharon E. Buhr, MPH.
Wanda Agnew, PhD, LRD - Public Health Dietitian

Nebraska
Omaha Greater Area Physicians for Social Responsibility
Public Health Association of Nebraska

New Mexico
New Mexico Physicians for Social Responsibility
New Mexico Public Health Association
Bernalillo Community Health Council
Bill Monroe, RN
Phil Marcus, President New Mexico Nurse Practitioner Council
Robert Bernstein, Board Member Physicians for Social Responsibility

Nevada
Nevada Public Health Association
American Lung Association in Nevada

New York
New York State Public Health Association
Patrick L. Kinney, ScD, Mailman School of Public Health, Columbia University

Ohio
Northeast Ohio Physicians for Social Responsibility
Ohio Public Health Association
Anna M. Winfield, MD, MPH, FAAP
Antonnette Graham, PhD, University Educator and Researcher
David G. Litaker, MD, PhD, Associate Program Director, University Hospitals Case Medical Center Preventive Medicine and Public Health Residency
J. Mac Crawford, RN, MS, PhD, Assistant Professor of Clinical Public Health, OSU College of Public Health
Jason Chao, MD
Kathleen Morris, MSA, RN
Mary Lynne Zahler, MA, CHES, CWP, LSW, CFLE, CCLS

Oregon
Oregon Physicians for Social Responsibility

Pennsylvania
American Academy of Pediatrics, Pennsylvania Chapter
American Lung Association of Pennsylvania
Erie County Board of Health
Pennsylvania Public Health Association
Philadelphia Physicians for Social Responsibility
Womens Health & Environmental Network
Duanping Liao, MD, PhD
Esther Chung, Associate Professor of Pediatrics, Jefferson Pediatrics/duPont Children's Health Program
James Plumb, Director, Center for Urban Health, Thomas Jefferson University and Hospital
Jeff Yanosky, Sc. D, Assistant Professor, Epidemiology, Public Health Sciences
Stephen Krebs, MD
Thomas J. Maroon, MD
Trina Peduzzi, MD
Tyra Bryant-Stephens, Director, Community Asthma Prevention Program, Children's Hospital on Philadelphia
Walter Tsou, MD, MPH

Rhode Island
Rhode Island State Nurses Association

South Dakota
South Dakota Public Health Association

Texas
Austin Physicians for Social Responsibility

Utah
Utah Public Health Association

Virginia
Carol A Maxwell, RN
Marilyn S. LeGrow, RN
Wynne V. LeGrow, MD

Vermont
Vermont Public Health Association

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