

Degrees of Danger

How Smarter Energy Choices Can Protect Our Health in California

By Nancy Evans, Health Science Writer/Editor/Consultant

This year's Bulletin will focus on the Earth's environment and how it is affecting the human race—as well as how the human race is altering our planet's environment. Our 2005 Bulletin cover's wrap-around reproduction of Gordon Haddow's spectacularly artistic photograph of the High Sierra, beyond its aesthetics, is intended to serve as a reminder that our jewel, California, is but a microcosm of both our nation and our planet. Just as California's populace is the largest and most diverse of our nation (and perhaps, of the world), so too is California's diversity of landscapes, ecosystems and climates. Among the most ominous environmental threats imperiling the health and quality of the lives of our citizens are global warming, climate change and air pollution. The following article is a concise exposition on these intertwined topics. It is our hope that it will stimulate you to join the ranks of advocacy for a national commitment to the necessary research and policy analysis that will lead to environmental decisions informed by thoughtful insights. A solemn reminder for us is that California currently hosts our nation's four leading smog-polluted (ozone-polluted) metropolitan areas: Fresno, Bakersfield, Visalia-Tulare-Portersville, and, of course, Los Angeles-Riverside-Orange County. As Kermit the Frog said, "It's not easy being green."

—The Editor

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This report was prepared by Physicians for Social Responsibility to alert California residents to the potential health effects of climate change and air pollution and how our energy choices and reliance on fossil fuels impact our health.

Executive Summary

"A continuously warming earth will not forever support people; a continuously rising sea is the enemy of coastal dwellers everywhere."

—George Woodwell

California is a microcosm of America, with the largest, most diverse population of any state, and an equal diversity of climates, landscapes, and ecosystems. From Death Valley to Sequoia National Park, from Sacramento to San Diego, and from the white sandy beaches of La Jolla to Mount Whitney, the tallest mountain in the lower 48 states, Californians can experience almost any weather or terrain imaginable. Many Californians enjoy a quality of life unmatched by that found in other states. However, Californians' quality of life and health now face two major threats: air pollution and global climate change. Fortunately, California has a long history as a leader in improving air pollution and creating innovative technologies. The time has come to use this know-how and ingenuity to protect the health of this great state.

Smarter Energy Choices—Cont'd

This report will discuss how air pollution is affecting our health, contributing to climate change, and threatening our quality of life and the health of the state's economy, now the fifth largest in the world. It will also outline methods California can take to continue its leadership in environmental innovations in order to move California to a sustainable future by reducing or eliminating air pollution, slowing the rate of climate change, and reducing the negative impacts on the state. Californians have the ability and the responsibility to take action to protect their health and stop the human-made causes of climate change.

The Challenges

Since the end of the last Ice Age 10,000 years ago, our planet has been warming very, very slowly—only 9°F in all that time. Recently, however, the rate of warming has accelerated almost 10-fold. Global mean surface temperatures increased 0.6– 1.2°F between 1890 and 1996. The 1990s were the warmest decade of the 20th century.

Scientists attribute this intensified “greenhouse effect” to human activities, namely, human-generated emissions of greenhouse gases. These greenhouse gases accumulate in the atmosphere and act as a blanket, trapping heat underneath and raising temperatures here on the ground. The most important greenhouse gas is carbon dioxide (CO₂), which is responsible for about two-thirds of the climate change.

Because a warmer atmosphere holds more water, climate change will alter precipitation patterns, leading to wetter climates in some places, drier climates in others. Warmer air also changes wind patterns, so the resulting weather changes will vary from place to place. If this process is allowed to continue, the world can expect more extreme weather—more heat waves, more severe storms, and even cooler temperatures in certain areas.

Uncertainties exist concerning the precise effects of global climate change, but the evidence that Earth is warming is now indisputable. Climate change is expected to increase average temperatures worldwide between 2.5 and 10.4°F by 2100. California will not be immune to this trend. Although it is impossible to predict exactly what climate change will mean for California, the evidence suggests that all life in the state—human, wildlife, forests, and crops—will be affected.

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Smarter Energy Choices—Cont'd

The Causes

Air pollution, energy production, and climate change are related to each other and human health. Most air pollution comes from the production of energy, primarily from burning fossil fuels, such as coal and oil, to power modern life. Air pollution includes greenhouse gases, which contribute to climate change, as well as other pollutants that endanger our health and diminish the quality of our lives.

Fossil fuels, burned to run cars and trucks, heat homes and businesses, and power factories, generate approximately 80 percent of CO₂ emissions in the U.S. Although the U.S. has only four percent of the world's population, it emits nearly 25 percent of the total global greenhouse gases, and emissions are rising. Fossil fuel combustion also produces pollutants including nitrogen oxides, sulfur dioxide, hydrocarbons, mercury, particulates, and carbon monoxide. These pollutants can cause serious health problems like asthma, lung inflammation, bronchitis, pneumonia, decreased resistance to respiratory infections, developmental delays and disabilities, and even premature death.

California has the most polluted air in the country. The top four ozone-polluted (smog-polluted) metropolitan areas were in California: Los Angeles-Riverside-Orange County, Bakersfield, Fresno, and Visalia-Tulare-Porterville. According to the California Air Resources Board, 90 percent of Californians breathe unhealthy air during some part of the year. If fossil fuels continue to be the main energy source, climate change is expected to further foul the air.

The Solutions

The potential effects of climate change on our health and the health of California's diverse and fragile ecosystems are daunting. However, California is better positioned than any other state in the nation to lead the way in finding clean energy solutions. A broad range of solutions is already underway in the state, but others remain to be developed and implemented. This report outlines solutions and actions, both personal and political, which can slow and eventually reverse climate change and protect our health and the health of the economy in the process. However, we have a narrow window of opportunity to put that process in motion. As concerned Californians, we have the responsibility to act now.

The number one priority is to reduce air pollution and the emission of greenhouse gases such as CO₂ by decreasing the use of fossil fuels. The first step is to toughen fuel economy standards for gasoline-powered cars and trucks. California's 23.4 million motor vehicles consume 14 billion gallons of gasoline every year and produce 37 percent of the nation's CO₂ emissions. Tougher fuel economy standards would immediately reduce CO₂ emissions and allow consumers to

Smarter Energy Choices—Cont'd

save money. America's love affair with the sport utility vehicle (SUV) has helped increase pollution levels and decrease fuel economy standards to their lowest level in 20 years. All vehicles, including light trucks and SUVs, must meet tougher fuel economy standards.

Technology already exists to produce cars with greater fuel economy, which burn less gasoline and emit less CO₂. A limited number of these vehicles are available now, but industry and government must be pressured to invest in these technologies and produce more vehicles that are environmentally responsible.

Tougher fuel economy standards are not enough. We must begin a transition to cleaner energy—wind, solar, and biomass energy. These alternative energy sources are clean, safe, renewable, and available or within our reach. An economy based on cleaner fuels will help California prosper, gain its freedom from fossil fuels, and improve human health and quality of life.

The technology exists to transition to cleaner energy. By demanding that government and industry invest in and use renewable sources of energy, CO₂ production can be reduced. Technology also exists to clean up the power plants that help generate California's electricity, which would immediately reduce CO₂ and other greenhouse gas emissions.

Increasing and improving mass transportation will also reduce greenhouse gas emissions. Other options include rideshare programs and high-occupancy vehicle (HOV) lanes, now available in Sacramento, San Francisco, San Diego, and other parts of Southern California. Better city and regional planning to decrease urban sprawl will reduce the need for long commutes, thereby reducing greenhouse gas emissions, as well as waistlines, as Californians walk more.

As we implement these solutions, we must also protect California's most vulnerable populations, regions, and resources. The health and well being of farm workers in the Central Valley, people in border communities, and the young, the old, and the poor throughout California are at risk of harm from climate change. Our limited water resources are also at risk, as are the forests and other fragile ecosystems.

California's booming population—now at 34 million and projected to reach 45 million by 2020—increases the urgency of moving to cleaner, more efficient production and consumption of energy and wiser use of natural resources. Without that transition, California will be unable to sustain life as we know it. Making the transition to cleaner energy and cleaner air will take time and money, but most of all, it will take the political will and personal commitment of the people of California.

How Climate Change Could Threaten the Health of Californians

According to physicians who have studied the effects of climate change, the major health risks in California could include the following:

More frequent gastrointestinal infections caused by shortages of clean water:

- Changes in precipitation amounts and patterns, resulting in more rain and less snow, leading to flooding in some areas and droughts in others, thus decreasing the supply of clean water.
- Floods and droughts, the former contaminating the water supply with bacteria, viruses, and parasites from runoff polluted with animal and human wastes, the latter concentrating the pollutants during low stream flows.
- Rising sea levels contaminating the water supply due to salt intrusion, making it unfit to drink and unsafe for freshwater aquatic life.

More frequent and severe attacks of asthma and worsening of other respiratory and cardiac problems caused by increased air pollution:

- Increased ozone (smog) levels.
- Increased emissions of nitrogen oxides, sulfur dioxide, particulate matter, and other toxic pollutants.
- Smoke from forest fires resulting from drought.
- Increased pollen levels.

Greater risk of vector-borne infectious diseases:

- Hotter temperatures increase the risk of mosquito-borne diseases such as malaria, dengue fever, and West Nile virus.

More accidents, injuries, and loss of life and property:

- A projected increase in sea level of one to three feet by the year 2100 could bring flooding and coastal erosion, especially when complicated by storm surge.
- Extreme weather conditions such as the El Niño ocean warming phenomenon would lead to torrential rainstorms, floods, and mudslides.

More heat-related illness:

- Heat-related deaths could increase significantly.
- Seniors, infants and young children, and the poor face the greatest risk of illness and death from extreme heat.

Smarter Energy Choices–Cont'd

Solutions to Prevent Climate Change

Clearing the air in California and slowing the rate of climate change demands several approaches. These approaches include:

- **Increasing our use of renewable energy sources** such as wind, solar, and biomass energy.
- **Decreasing our use of fossil fuels** by improving energy efficiency of power plants and motor vehicles and encouraging innovation in developing alternative fuel vehicles.
- **Improving and expanding mass transportation.**
- **Planning for smart growth and restricting sprawl.**

Physicians for Social Responsibility

1875 Connecticut Ave., NW, Suite 1012

Washington, DC 20009

tel: (202) 667-4260

fax: (202) 667-4201

website: www.psr.org

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