

The Heat Is On:

Climate Change And Emerging Policies

*By Robin Tokmakian**

Climate Change Defined

We can think of the earth as comprised of four components: the atmosphere, the land masses, the ice-covered surfaces and the oceans. Each absorbs, retains and releases heat, and interacts with each other in complex ways.

Some atmospheric chemical compounds (e.g., carbon dioxide, methane, nitrous oxide, chlorofluorocarbons and sulfur hexafluoride) are called “greenhouse gases”

(GHG). GHGs and water vapor, allow sunlight to pass through the atmosphere, to be absorbed by the Earth’s surface. Energy from the surface is returned to the atmosphere as heat, absorbed by the gases. This warms the atmosphere. Greenhouse warming occurs when the atmosphere radiates this heat back to the Earth’s surface. Without some greenhouse warming (mainly by water vapor), the Earth would be too cold to sustain life.

Both natural and man-generated phenomena (e.g., forests and coal burning) cause changes in GHG concentrations. In addition to GHGs, changes in the Earth’s orbit and in solar radiation, along with volcanic eruptions affect climate. But since the industrial revolution, the levels of GHGs have been causing rapid increases in global temperatures, greater than observed for thousands of years. This effect, referred to as global warming or climate change, is predicted to make

the Earth between 2.4 and 6.4°C warmer by 2099 if we continue our current habits into the future. Because of complex interactions, this amount of warming very likely will increase coastal flooding, increase droughts at mid-latitudes, and produce warmer days and more frequent hot days.

We can see direct changes in a warmer Earth by monitoring, for instance, the daily temperatures or precipitation at locations around the globe. However, what we measure locally is the result of both local changes and changes occurring further away. For example, melting glaciers can change sea levels everywhere; a warmer atmosphere changes carbon dioxide mixing in the ocean, making it more acidic and affecting the biota that depend on calcium carbonate.

Changes in the Earth's climate, by any number of natural or man-made causes, affect the Earth's resources as well. In the past, animals (including man) and plants have been able to migrate and adapt to slowly changing climates. There has been an abundance of land and other resources, so man was only limited by how far he could travel. With the Earth's resources (water, land and energy) more limited now than in the past, the current extreme and rapid changes in our climate pose a greater challenge to the survival of both human societies and natural ecosystems.

International Response

The study and understanding of global warming are not new; the greenhouse effect was recognized early in the 19th century. Recent serious scientific study of the topic extends back to at least the 1970s.

Because of these earlier studies and the growing need to understand the problem of the Earth's warming, the World Meteorological Organization and the United Nations Environment Programme established the Intergovernmental Panel on Climate Change (IPCC) in 1988. Since then, the IPCC has issued four reports (1990, 1995, 2001 and 2007). These "Assessment Reports" provide policymakers and others with an overview of the science and related research findings behind our changing climate.

The "Principles Governing IPCC Work," approved at the 14th Session (Vienna, October 1–3, 1998) and amended at the 21st Session (Vienna, November 3 and 6–7, 2003), state:

The role of the IPCC is to assess on a comprehensive, objective, open and transparent basis the scientific, technical and socio-economic information relevant to understanding the scientific basis of risk of human-induced climate change, its potential impacts and options for adaptation and mitigation. IPCC reports should be neutral with respect to policy, although they may need to deal objectively with scientific, technical and socio-economic factors relevant to the application of particular policies.

As a result of the first IPCC Assessment Report in 1990, the UN created the Intergovernmental Negotiating Committee for a UN Framework Convention on Climate Change in 1992. The U.S. signed this agreement under President George H. W. Bush. This document provides the framework for governments to gather and share information on GHG emissions and policies, allows for the development of national strategies to reduce emissions and adapt to the impacts, and includes financial and technological provisions to help developing countries cooperate in adapting to the impacts of climate change. The second Assessment Report of 1995 provided information for continued negotiations that led to the adoption of the Kyoto Protocol in 1997.

The Kyoto Protocol created a legal mechanism that obligates the signatory parties with the highest emissions to limit or reduce them by 6 to 8 percent. Countries become parties to the agreement with ratification. As of June 2007, 175 countries have ratified it, but not the U.S. Thirty-six of these countries and the European Union (all developed countries) are required to reduce GHG emissions below specific levels. The agreement became enforceable in 2005 when 55 countries that accounted for 55 percent of emissions had ratified it.

Various countries have now begun to

address the problems of reducing GHG emissions. Europeans created a market-based approach to controlling pollution. This approach requires a mandatory cap on an emitted pollutant combined with economic incentives for reducing emissions. It is based on the U.S. program to reduce the emission of the atmospheric pollutants that cause acid rain. This "cap-and-trade" approach has been only partially successful, in part because of the volatility of this new kind of market and in part because polluters were given allowances that exceeded the total emissions. Recently (June 2007), China released its own set of policies that indirectly address emissions; one is to improve efficiency in energy use (via government regulations). Other countries have adopted policies similar to Europe's or are addressing the problem as China is by concentrating on energy efficiency improvements. The first approach rewards the private sector, while the second puts in place more government regulations.

U.S. Federal and State Responses

In the U.S., discussions on whether or not to ratify the Kyoto Protocol began in the late 1990s. In 1997, prior to the signing of the Kyoto Protocol, Congress passed the non-binding Byrd-Hagel Resolution. The resolution states that the U.S. will not enter into an agreement that (1) will be detrimental to the U. S. economy and (2) does not require "meaningful involvement" on the part of developing nations. The Kyoto Protocol agreement does not contain binding agreements for developing countries. However, in 1998, the U.S. under President Bill Clinton agreed to a 7 percent reduction in emissions, something the Senate is yet to ratify.

In 2001, with the change in administration, the U.S. announced it would not implement the Kyoto Protocol. In 2007, the increased certainty of the science of climate change (as shown in the recently released IPCC's Fourth Assessment Report) and a broader recognition of the problem by the public has nudged

Congress towards federal legislation. Committee hearings have been held in both the Senate and the House with the purpose of creating legislation that will significantly lower GHG emissions.

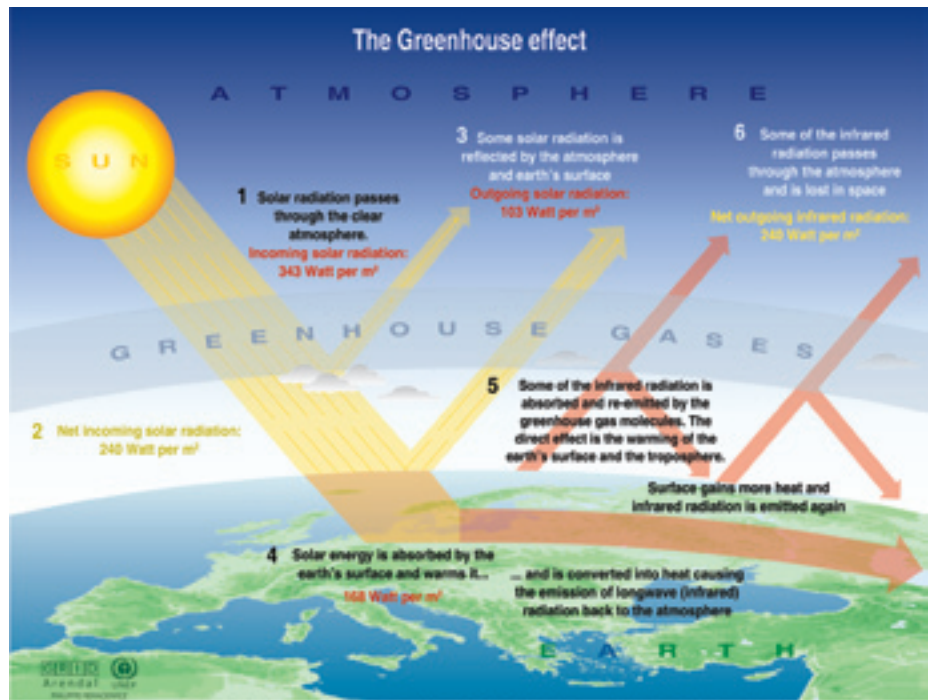
Legislation addressing climate change has been introduced in Congress since 1999, but most action has occurred at the city or state level. States are addressing the issue using a wide range of methods. Alaska, North Carolina and Arkansas have created Climate Change Commissions. Others, such as Maine and Connecticut, have created action plans that establish goals for emission reductions by certain future dates. Legislation requiring emission inventories and reporting the extent of emissions has been enacted by several states, including Wisconsin, West Virginia and California.

California, using the Clean Air Act, has passed a law requiring reduction of the GHG emissions from cars and light trucks. California's rules have been or are being adopted by 12 other states (in the Northeast, along the West Coast plus Arizona and Florida). California, Washington and Minnesota have also adopted GHG emission standards for electric power. In 2001, the Conference of New England Governors and Eastern Canadian Premiers adopted an agreement setting GHG reduction targets. Regional cap-and-trade programs (similar to the EU program) are being developed by two groups of states: the Regional Greenhouse Gas Initiative (RGGI) formed by ten Northeastern and Mid-Atlantic states, and the Western Regional Climate Action Initiative by six Western states and British Columbia.

What Next?

The public's growing concern of the need to address the causes behind our warming climate is creating a positive atmosphere for passing effective legislation. Most likely, the solution will be a broad range of regulations, government incentives and increased public awareness that will result in changes in habits and technologies.

Available strategies include improved efficiencies in energy use (including standards



Sources: Chananjan university college in Canada, Department of geography, University of Oxford, school of geography; United States Environmental Protection Agency (EPA), Washington; Climate change 1995, The science of climate change, contribution of working group 1 to the second assessment report of the intergovernmental panel on climate change, UNEP and WMO, Cambridge university press, 1995.

such as those for motor vehicles), cap-and-trade policies, requirements for alternative fuels and increased use of clean, renewable energy (e.g., solar, wind, geothermal and wave energy), a carbon tax, increasing nuclear energy generation, and increasing funding for research in areas such as carbon capture and cleaner coal technologies. All of these strategies, with the exception of improved energy efficiency, have both benefits and drawbacks. The effects on the economy and the ability to reduce GHG emissions over time differ with each strategy.

In the current, 110th Congress, about 70 bills have been introduced addressing various climate change topics, such as GHG emission limits and emission reporting (including many options for a cap-and-trade system), climate friendly technology research and development, long-term carbon storage in the biosphere, in oceans or underground, and national security related climate change policies. A carbon tax is also being discussed. Bills have been introduced that would divert some of the enormous incentives and tax breaks for developing fossil fuel toward clean energy and alternate fuels. Some of the slowness to act may be attributed to the fear of harming the nation's economy and to the

lobbying efforts by various economic sectors, including energy and automotive.

The economic impact of not reducing our GHG emissions also has consequences that should be recognized. Energy costs are likely to increase because of decreasing supplies, inefficient use of energy and increasing demand. As time passes without action, economic costs to address climate change will rise because it will require a greater effort to reduce emissions to an acceptable level and to mitigate previous damage to the environment. In a controversial report for the UK government (2007), economist Sir Nicholas Stern said that the costs of reducing GHG emissions would be much less than the cost of adapting to a changing climate. Either way, there will be a significant economic cost. ■

**Robin Tokmakian is a member of the LWV Monterey Peninsula, CA. Her colleagues on the Climate Change Taskforce Donna Ewing (LWV Thurston County, WA) and Chad Tolman (LWVDE) contributed to this article.*

VOTER LINKS

■ <http://www.ipcc.ch>