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Action On Climate Change

This guest editorial is by Jerry A. Bell and Bassam Z. Shakhshiri. Bell is an emeritus professor in the department of chemistry at Simmons College, in Boston; he chaired the American Chemical Society's Presidential Working Group on Climate Science. Shakhshiri was ACS president in 2012 and is the William T. Evjue Distinguished Chair for the Wisconsin Idea in the department of chemistry at the University of Wisconsin, Madison.

ATMOSPHERIC CONCENTRATIONS of carbon dioxide, methane, and other greenhouse gases are increasing. The well-known greenhouse effect caused by these gases traps solar energy, warming Earth's atmosphere, land, and oceans and melting its ice. Thermal expansion of ocean water and liquid from melting land ice are raising sea levels, and dissolution of more carbon dioxide is lowering ocean pH. These observed changes are largely caused by human activities. The burning of fossil fuels drove the Industrial Revolution, which enormously raised the standard of living of much of the world, but it is also changing the climate.

Large increases in the amount of energy in Earth's climate system of necessity produce changes, such as more water vapor in the air and more intense storms. The extent of these effects is not yet well characterized. But, as the system gains more energy, climate changes are likely to be larger and more lifestyle disruptive. Because the increasing amounts of greenhouse gases are responsible for the buildup of energy in the climate system, actions to reduce emission of these gases are needed now.

Actions by individuals and society as a whole, which includes scientific professional organizations such as ACS, are required. Individuals, for example, can use more efficient lighting and appliances, make greater use of public transportation, drive low-emission vehicles, teleconference more and travel less, support efforts to mitigate the undesired consequences of climate change, and encourage government representatives to do the same. ACS has implemented approaches such as these in its headquarters buildings, which have been awarded platinum certification by the Leadership in Energy & Environmental Design (LEED) program of the U.S. Green Building Council.

Chemists and other scientists can reinforce their knowledge of climate science by using the ACS Climate Science Toolkit. The tool kit provides scientists with the background and incentive to engage others in discourse on the issues raised by climate change and the need to take action. Individual actions have small effects on energy consumption, but inaction has zero effect.

Individuals acting collectively—that is, society working through the social contract—can implement even more effective measures to mitigate climate change. But because the effects of collective action are larger and may affect individuals differently, these actions are more controversial, even when based on sound scientific and economic principles. An example of such a measure is a revenue-neutral carbon tax imposed at the source—the wellhead, mine, or port of entry. As the cost of the carbon is passed along, individuals have an incentive to lower their carbon footprint. As they do so, the value of their share of the tax proceeds that are distributed is maximized, and overall energy use and greenhouse gas emissions are reduced. In practice, the political will of the collective is required to enact any such approach, as is agreement that continued climate change will result in the severe consequences that climate scientists expect.

A responsibility of ACS is to further support and fortify its members in their efforts to communicate the science and effects of climate change. ACS has done this with its Climate Science Challenge Grants that local sections have received. ACS must continue to promote the ACS policy on global climate change developed by the Committee on Environmental Improvement and approved by the ACS Board of Directors. The policy provides credibility for members as they interact with others, including elected representatives, about the consequences of climate change. ACS should energize its members and affirm its commitment as a leader among scientific professional associations to advocate for local, national, and international actions that reduce the effects of climate change for the benefit of Earth and its people.

Jerry A. Bell
Bassam Z. Shakhshiri

Views expressed on this page are those of the author and not necessarily those of ACS.