

CLIMATE CHANGE

The Earth's climate is changing in response to increasing concentrations of greenhouse gases (GHGs) and particulate matter in the atmosphere, largely as the result of human activities. Chemistry is at the heart of understanding the climate system and integral to addressing the development and deployment of new emission reduction technologies and clean energy alternatives. The American Chemical Society (ACS) acknowledges that climate change is real, is serious and has been influenced by anthropogenic activity. Unmitigated climate change will lead to increases in extreme weather events and will cause significant sea level rise, causing property damage and population displacement. It also will continue to degrade ecosystems and natural resources, affecting food and water availability and human health, further burdening economies and societies. Continued uncontrolled GHG emissions will accelerate and compound the effects and risks of climate change well into the future.

International cooperation will be crucial to addressing climate change, and continued U.S. participation in efforts such as the Paris Agreement is essential. Many solutions to reduce GHG and pollutant emissions are known and should be implemented through policy changes, partnerships, and education. These mitigation policies (e.g. GHG emission reduction) must be augmented by improved approaches for anticipating and adapting to adverse and unavoidable impacts of climate change. Risk reduction by proactive mitigation and adaptation strategies is preferred over global climate intervention schemes where the outcome is difficult to predict and beyond our power to control. Continuing to improve and strengthen our societies' scientific understanding and literacy concerning all aspects of climate change is vitally important, enabling us to make informed decisions at national and international levels and helping us to lessen the future risk of climate change.

Recommendations

The United States should be a leader in efforts to combat climate change. The U.S. Government should:

- Work actively at all levels of government including state, city, and local government and internationally to coordinate and plan mitigation and response strategies.
- Recognize that climate intervention strategies where the potential environmental repercussions are unclear, such as geoengineering, are not acceptable substitutes for reducing greenhouse gas emissions and for responding to climate change through adaptation.
- Promote climate science literacy and education for citizens and policymakers about climate change impacts to help empower citizens and local and regional governments to make informed decisions and preparations to help protect homes, businesses, and communities against adverse impacts.

The United States must take meaningful steps to reduce GHG emissions and deploy advanced and sustainable energy technologies.

- The U.S. must systematically invest in and encourage the development and deployment of advanced and sustainable energy technologies, enabling them to operate under comparable economic advantages relative to incumbent energy sources. Incentives such as subsidies, taxes, and regulations are options.

The American Chemical Society (ACS) Board of Directors Committee on Public Affairs and Public Relations adopted this statement on behalf of the Society at the recommendation of the Committee on Environmental Improvement. ACS is a non-profit scientific and educational organization, chartered by Congress, with nearly 157,000 chemical scientists and engineers as members. The world's largest scientific society, ACS advances the chemical enterprise, increases public awareness of chemistry, and brings its expertise to state and national matters.

American Chemical Society, 1155 Sixteenth Street NW, Washington DC 20036, 202-872-4386, www.acs.org/policy

- The United States government should incentivize and collaborate with business and industry to develop and adopt clean energy technologies and energy-efficient processes.
- Decisions about U.S. technology deployment should incorporate comprehensive life cycle analysis of the environmental, health, safety, economic and social impacts of new and existing technologies.

The United States should prioritize scientific research on climate change and its consequences and the most effective ways to respond to and prepare for its impacts. In particular, the U.S. Government should:

- Provide robust and uninterrupted federal funding for a comprehensive Earth systems research program, including full investigation of the interactions of Earth systems with vital societal systems.
- Fund research to evaluate the effectiveness and implications of climate change response strategies, using the findings from this research to inform climate change response planning, coordination, and decision making on a local, national, and global level.

Inevitable impacts of climate change must be addressed by planning and action to minimize societal upheaval, loss of life and destruction of property.

- The costs of repairing or delaying the damages caused by climate change must be weighed against the long term viability of these solutions, with a preference for investments that will lead to lasting solutions.
- The government should work to protect disadvantaged groups who might be disproportionately impacted by climate change and lack the means or resources to prepare, adapt, or respond.

References

1. IPCC Fifth Assessment Report (AR5) (<http://www.ipcc.ch/>)
 - a. Climate Change 2013: The Physical Science Basis
 - b. Climate Change 2014: Impacts, Adaptation, and Vulnerability
 - c. Climate Change 2014: Mitigation of Climate Change
 - d. Climate Change 2014: Synthesis Report. (*IPCC is 95 percent certain that humans are the main cause of current global warming.*)
2. U.S. Global Change Research Program (USGCRP)
National Climate Assessment Report – 2014
<http://www.globalchange.gov/browse/reports>
Climate Literacy: The Essential Principles of Climate Science
<http://www.globalchange.gov/browse/educators>
3. National Academies/National Research Council (NA/NRC)
Abrupt Impacts of Climate Change – Anticipating Surprises (2013) <https://nas-sites.org/americasclimatechoices/other-reports-on-climate-change/2013-2/abrupt-impacts-of-climate-change/>
Climate Intervention: Reflecting Sunlight to Cool Earth
http://www.nap.edu/catalog.php?record_id=18805
Climate Intervention: Carbon Dioxide Removal and Reliable Sequestration
http://www.nap.edu/catalog.php?record_id=18988
4. What We Know: The Reality, Risks and Response to Climate Change
http://whatweknow.aas.org/wp-content/uploads/2014/07/whatweknow_website.pdf

5. The ACS Climate Science Tool Kit
<http://www.acs.org/content/acs/en/climatescience.html>