

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 a broad range of human activities. The American Chemical Society (ACS) acknowledges that climate change is real, presents serious risk for civil society and business, and that human activity is the primary cause. Atmospheric carbon dioxide (CO₂) concentrations are increasing at a rate never observed before, primarily due to emissions from fossil fuel combustion. Extreme weather and related events, such as floods, droughts, hurricanes, heatwaves and wildfires, are increasing in frequency and intensity threatening Americans' physical, social, and economic well-being. Continued uncontrolled GHG emissions will compound the effects and risks of climate change well into the future. The world population will experience more extreme weather events which, coupled with sea level rise, will continue to cause coastal property damage and population displacement. Extreme weather and flooding events will further impact infrastructure (such as energy supply and transportation systems) leading to disruption of supply chains, business and industry productivity and military operations. Ecosystems and natural resources will continue to be stressed, affecting food and water availability burdening economies and societies. The effects of climate change on human health are a serious threat leading to increased illness and mortality rates, the spread of vector-borne diseases and epidemics and decreased efficiency of labor work forces among other impacts.

There is no single solution to stabilize our rapidly changing climate; aggressive policy action on all fronts is needed now at increased scales to mitigate and minimize unavoidable global environmental changes. Scientific facts and observations must inform climate policy and drive science-based targets at the federal, state and local levels. Comprehensive federal legislation to address climate change is urgently needed. The ACS acknowledges that the chemistry enterprise has an important role to play in helping to mitigate climate change by developing green technologies that meet GHG reduction targets. International cooperation is crucial to addressing the impact of human activities on the global climate system, and U.S. leadership in efforts such as the Paris Agreement is essential. Strategies to reduce GHG and pollutant emissions are known and must be implemented through policy changes, partnerships, and education. Mitigation policies (e.g. GHG emission reduction targets, use of renewable clean energy technologies and market-based approaches) must be augmented by improved approaches for anticipating and adapting to adverse and unavoidable impacts of climate change.

Recommendations

The United States should lead efforts to combat climate change. The U.S. Government should:

- Work internationally, providing leadership for promoting global treaties including ratifying the Kigali Amendment to the Montreal Protocol.
- Enable support for state, city and local governments to coordinate and plan mitigation and response strategies.

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 more than 158,000 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.

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- Recognize that climate intervention strategies where the potential environmental repercussions are unclear, such as some forms of 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 human impacts on climate, and the consequences of climate change.
- Advance policies that drive innovation in green chemistry in partnership with industry and academia.

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

- Utilize carbon pricing policies to help mitigate carbon and other high global warming potential GHG emissions to better reflect the true value of carbon-based fuels and promote use of carbon capture and sequestration on existing CO₂-producing technologies.
- Incentivize and enable partnerships with industry and academia to adopt zero- and low-carbon energy technologies and avoid over-reliance on currently lower-cost GHG-generating fuels as a long-term strategy.
- Encourage development and use of civilian nuclear power while providing necessary oversight for storage and disposal of nuclear waste.
- Support programs aimed at reducing methane (and other GHG) emissions from sectors such as oil and gas, agriculture and municipal waste facilities.
- Support implementation and updating of energy efficiency standards that help reduce emissions associated with electricity generation and transportation fuel use.
- Provide technological leadership on the global stage for green chemistry and sustainable energy technology, which includes domestic and foreign investment in the application of alternative energy strategies, training and partnership for sustainability efforts in emerging countries.

The United States should prioritize scientific research on climate change and its consequences. In particular, the U.S. Government should:

- Provide robust and uninterrupted federal funding for comprehensive Earth systems research programs to better quantify the dynamic feedback between air, land and ocean temperature changes with a focus on reducing uncertainties related to anthropogenic aerosol impacts on cloud formation and the Earth's energy balance.
- Fund research on the human health impacts of climate change, including the likelihood, frequency and distribution of climate-related disease.
- Fund research to evaluate the effectiveness and implications of climate change response strategies to inform climate change response planning, coordination, and decision making on local, national, and global levels.

Address the inevitable impacts of climate change by planning and action to minimize societal upheaval, loss of life and destruction of property.

- The costs of repairing or delaying the repair of the damages caused by climate change must be weighed against the long-term viability of the proposed solutions. Federal or

local funding for natural disaster response should help communities develop a stronger and more resilient infrastructure.

- 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.
- Develop national strategies for preparedness and adaptation for the short- and long-term risks of climate change, including evacuation, resettlement, supply chain disruption, property insurance and land use planning.

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