SUSTAINABILITY AND THE CHEMISTRY ENTERPRISE

Earth's resources, while vast, are finite. Increasingly, humans have come to realize that we must be better stewards of those resources and that economic activity must be carried out in ways that do not compromise the ability of future generations to prosper. The sustainability challenge is to develop innovations and policies that allow humanity to meet current and future environmental, human health, economic, and societal needs.

The chemistry enterprise has many roles in sustainability. It provides chemicals, materials, and technologies that improve the safe and efficient use of energy and natural resources and is responsible for delivering them in a way that protects human and environmental health. Chemistry—in labs, classrooms, and industry—is a central science for the development of sustainable technologies and innovations. Industry is responsible for the natural resource and environmental impacts of its actions. Government sets standards for resource and environmental performance through the policies it enacts and enforces.

Policies have consequences. Sustainable development requires shifts in policies from a linear "take make waste" economy toward an economy where products are designed to enable the waste of one product system to serve as the raw material of another.

The American Chemical Society recognizes the importance of environmental sustainability and that modern civilization depends on it. Environmental considerations and economic growth are not mutually exclusive. We believe the chemistry enterprise must continue to provide leadership in forging the science and technology that will provide humanity with a sustainable path into the future.

The global competitiveness of the U.S. chemistry enterprise depends on governmental policies that contribute to the environmental progress required for sustainable development. Other countries embracing a sustainability agenda are making economic inroads on the U.S.; they see the vast market opportunities implicit in achieving the UN Sustainable Development Goals. Federal government participation in global environmental treaties is vital to the interests of American business. ACS believes well-constructed environmental policy fosters business competitiveness globally.

ACS Recommendations

The chemistry enterprise has a key role in advancing sustainability. Necessary progress on this path requires the cooperation of the federal government. Modest adjustments in federal policies can have a large impact on advancing sustainability within the chemistry enterprise and the society it supports. Recommended government actions include:

- Preserve core science-based environmental protections afforded by current regulatory programs under the Clean Water Act and the Clean Air Act
- Prioritize sustainability when investing public funds in infrastructure
    - Promote electrification of transportation

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 Committees on Environmental Improvement and Science. 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.

    - Use recycled and benign materials in construction of roads and other infrastructure projects
    - Adopt full cost accounting (including long-term financial, social, and environmental costs) in procurement of goods and services
- Lead by example
    - Promote energy policies that consider full life cycle costs of energy sources and minimize environmental impacts
    - Endorse adoption of the UN Sustainable Development Goals (https://sustainabledevelopment.un.org/sdgs)
    - Demonstrate the use of sustainable technologies in government functions (e.g., non-crop derived biofuels in military applications)
    - Specify sustainable materials in procurement guidelines
    - Make decisions based on reliable data sources, e.g., peer-reviewed science
- Sponsor fundamental research to enable long-term advances for sustainable manufacturing toward improving resource (e.g., energy, water) efficiency
- Facilitate adoption of more sustainable technology
    - Increase federal funding for sustainable chemistry research and development
    - Ensure government support for demonstration of sustainable chemistry at industrial scale to promote its adoption
    - Implement tax incentives to early adopters of sustainable manufacturing technology
    - Promote preferential hiring of scientists and engineers educated in sustainability principles and practices
- Support global competitiveness of U.S. business leaders in sustainability
    - Engage other nations in the formulation and implementation of global environmental agreements (e.g., Stockholm Convention, accords under the UN Framework Convention on Climate Change, Minimata Convention)
    - Advocate the interests of more sustainable American businesses in these negotiations
- Provide new national-level economic instruments to foster:
    - Cradle-to-grave environmental accountability for products introduced into the market
    - Development of a circular economy to repurpose product materials after end of first life
    - Consideration of preserving ecosystem services, such as natural water filtration, food production, and flood mitigation in governmental decision-making
- Reform economic policies and structures to internalize the externalities of pollution into business decisions (e.g., establish a price for CO2 emissions)
- Track and publicize sustainability progress

    - Engage business and academic community to collaboratively define practical national sustainability metrics
    - Conduct environmental sensing to observe ambient environmental conditions and monitor changes in them (e.g., NOAA, USGS)
    - Collect and publicly distribute emissions data through Toxic Release Inventory and greenhouse gas reporting to track progress
- Assure resources and support for developing and implementing curricula integrating sustainability and green chemistry concepts across all levels of education
- Maintain award programs, such as the USEPA Green Chemistry Challenge Awards, that recognize businesses and academic researchers for significantly advancing sustainability.