



Resolution 17-1  
Approved April 8, 2017  
Washington, DC

Revised April 27, 2020  
All Members Call

As certified by  
Donald Welsh  
Executive Director

### **ADVANCING SAFER CHEMICAL PRODUCTS AND PROCESSES**

WHEREAS, U.S. industry is a leader in the growing domestic and global markets for high performing chemicals and processes through sustainable and green chemistry; and

WHEREAS, the chemical industry supports more than 25 percent of the gross domestic product of the United States<sup>1</sup>; and

WHEREAS, breakthrough technologies in sustainable and green chemistry can transform how industry thinks about performance, function, and synthesis to create new materials with better performance; and

WHEREAS, sustainable and green chemistry programs are based on principles that consider all life cycle stages, including manufacturing, use, and disposal when evaluating the environmental impact of products; and

WHEREAS, alternatives assessment is a process for identifying, comparing, and selecting, or initiating development of safer alternatives to chemicals of concern (including those in materials, processes, or technologies) on the basis of their hazards, exposure potential, performance, and economic viability; and

WHEREAS, sustainable and green chemistry innovators have been developing alternatives that struggle to compete when lifecycle costs are not considered or economies of scale in supply and production have not yet been achieved; and

WHEREAS, a safer alternative to a particular chemical may include a chemical substitute, a functional design approach that eliminates the need for any chemical addition, or an entirely new technology and business opportunity; and

WHEREAS, the growing field of alternatives assessment and safer chemicals development that includes work by industry, states, nongovernmental organizations, tribal communities, and other countries is helping to promote informed substitution; and

WHEREAS, leading and well-respected companies and organizations have publicly endorsed continuous improvement and innovation in chemicals management practices; and

---

<sup>1</sup> Chemical Innovation: Technologies to Make Processes and Products More Sustainable, U.S. GAO Report, GAO-18-307, 2/8/2018

WHEREAS, use of sustainable and green chemistry principles and alternatives assessments hold promise as ways to reduce the use of hazardous substances, to promote sustainable economic development, and to support the growth of high-value jobs.

NOW, THEREFORE, BE IT RESOLVED THAT THE ENVIRONMENTAL COUNCIL OF THE STATES (ECOS):

Encourages policymakers to establish organized consortiums at the state and federal levels to help make sustainable and green chemistry a priority and to create greater market demand for innovative chemistry, processes, and products;

Encourages the U.S. EPA to establish a Center of Excellence for Chemical Alternatives Assessment to promote chemical safety, human and ecosystem health, and economic competitiveness and innovation by advancing alternatives assessment methods, practices, and professional capacity;

Recognizes the 12 Principles of Green Chemistry as developed by Paul Anastas and John Warner<sup>2</sup>; and

Encourages the implementation of and increased federal, state, and private sector funding and technical assistance support for alternatives assessments, and sustainable and green chemistry innovations that satisfy the following principles:

**REDUCE HAZARD:** Reduce hazard to human health and the environment by replacing a chemical of concern with a less hazardous alternative. Reduce risk associated with a product or process if the exposure potential remains the same or lower. Consider reformulation or redesign to avoid use of the chemical of concern altogether.

**MINIMIZE EXPOSURE:** Assess use patterns and exposure pathways to limit exposure from alternatives that may also present risks.

**USE BEST AVAILABLE INFORMATION:** Obtain access to and use information that distinguishes between possible choices. Before selecting preferred options, characterize the product and process sufficiently to avoid choosing alternatives that may result in unintended adverse consequences.

**PROMOTE DISCLOSURE AND TRANSPARENCY:** Through regulatory and voluntary mechanisms, facilitate disclosure across the supply chain regarding key chemical and technical information. Engage stakeholders throughout the assessment process to promote transparency regarding alternatives assessment methodologies employed, data used to characterize alternatives, assumptions made, and decision-making rules applied.

**RESOLVE TRADE-OFFS:** Use information about the product's life cycle to better understand potential benefits, impacts, and mitigation options associated with different alternatives. When potential alternatives do not provide a clearly preferable solution, consider organizational goals and values to determine appropriate weighting of decision criteria and identify acceptable trade-offs.

---

<sup>2</sup> Anastas, P.T.; Warner, J.C. Green Chemistry: Theory and Practice, Oxford University Press: New York, 1998.

**CHOOSE SAFER ALTERNATIVES:** Choose safer alternatives that eliminate or substitute potentially hazardous chemicals. Other key factors to consider are: whether the substitutes are commercially available, technically and economically feasible, and satisfy the performance requirements of the process/product. Collaborate with supply chain partners to drive innovation in the development and adoption of safer substitutes through application of sustainable and green chemistry principles. Review new information to ensure that the option selected remains a safer choice.