

## ESSENTIAL BUILDING BLOCKS OF GREEN CHEMISTRY



In May 2007, California launched its Green Chemistry Initiative to fundamentally change how the state addresses toxic chemicals in order to develop safer processes and products, foster innovation, create new jobs, and reduce waste. The goal of the initiative is to shift away from the current model of cleaning up hazardous waste sites and managing pollution that result in the never ending cycle of health and environmental impacts, and to solutions that prevent the use of toxic materials in the first place.

The Green Chemistry Initiative has the ability to transform the way we manage chemicals, our products, and our environment and build a sustainable economy able to compete in the world marketplace.

In order for the Green Chemistry Initiative to be successful, it must embrace the following core concepts. Without these building blocks, the Initiative will fail to sufficiently address the fundamental flaws in chemical regulation in the state.

### **1. Move Away from Using Hazardous Materials and Releasing Them into the Environment**

Hazardous materials wreak havoc on our health and our environment. As new toxins enter the marketplace, we become stuck in a continuing cycle of having to address their impacts. The only truly effective way to solve these problems is to move away from using hazardous materials in the first place and replace them with "green" chemicals or non-chemical options. A genuinely green chemistry policy will foster the development of non- or less-toxic, sustainable alternatives and mandate their use. It will include legal, regulatory, technical, and financial support for this transition and will be applied to all chemical uses, including consumer products.

### **2. Recognize and Address All Hazards of Chemicals**

Chemicals can cause a number of different kinds of negative impacts on health and the environment. Recent advances in scientific knowledge have given us more information on these impacts than we have ever had before. A green chemistry policy would recognize and address all of the "hazard traits." Some of these hazard traits impact human health, others ecological health, while others refer to a chemical's ability to accumulate in the body (bioaccumulation) and how long it lasts in the environment (persistence). In identifying these traits, we must consider their impacts on the most vulnerable members of our society, such as pregnant women and children who are particularly vulnerable to some of the more frequently ignored hazard traits, including endocrine disruption and neurodevelopmental effects.

### **3. Take Early Actions on Bad Actor Chemicals**

A genuinely green chemistry policy will include specific early actions to eliminate the use of chemicals that we know are harmful to human health or the environment. This policy should include actions by the government as well as support for actions by businesses and individuals. Candidates for early action might include those toxic chemicals that are persistent, bioaccumulative, or are found in products used by infants and children.

#### **4. Require Comprehensive Data on Hazard Traits of Chemicals, and Require Industry to Demonstrate Chemicals Are Safe Before They Come to Market**

Though there is adequate data on the harm a significant number of bad actor chemicals cause, little information is available about the hazard traits of most chemicals, even more than thirty years after the passage of federal chemicals policy legislation. In fact, current U.S. policy actually discourages the study of the health and environmental impacts of the approximately 85,000 chemicals in commercial use today or those entering the market each year. Furthermore, U.S. government agencies are restricted in their ability to investigate chemical impacts; current laws require government to demonstrate that a chemical threatens human health and/or the environment in order to fully study and regulate them. This burden of prove should be switched to industry to show that chemicals are safe before they come to market.

Businesses that make or use hazardous materials are reluctant to voluntarily disclose the potential impacts associated with their products, often hiding behind such phrases as “confidential business” or “proprietary” information. This hinders the ability of the state to make proper decisions on chemical policies, of “end user” companies who use chemicals to choose safer alternatives, and of the public to protect itself. It is therefore essential for a green chemistry policy to put in place requirements for chemical manufacturers to produce and make available to the state comprehensive information accurately characterizing the hazard traits of chemicals in commerce. These requirements must ensure that data are produced in verifiable ways by independent entities that are subject to audit, with stiff penalties for false or misleading data. They should also ensure timely production of empirically verifiable results.

If any information is to be withheld, it must be the burden of the manufacturer to demonstrate why this is necessary. It should not be the burden of the government to demonstrate why information should be released. AB 289 (Chan-D), a bill on analytic testing methods adopted by the California legislature in 2006, provides an excellent model for addressing confidential business information.

#### **5. Provide for Development, Implementation, and Integrity of Testing Methods to Ascertain and Characterize Hazard Traits of Chemicals**

California must ensure that the testing methods used to determine chemical hazard traits provide us with the best possible information. While current methods were mostly developed twenty or more years ago, scientific research offers opportunities to develop better, faster, and more relevant methods, allowing us to better and more quickly ascertain any hazard associated with a given chemical. However, this requires focused attention and investment, free of interference from vested interests.

#### **6. Create an Information Matrix on Chemical Hazard Traits**

The public and chemical users need to know what chemicals are used in the products they buy or use. This, in conjunction with the information on chemical hazards, will allow individuals, businesses, agencies, and institutions to compare different chemicals and to choose low or no hazard alternatives.

A green chemistry policy would provide for greater transparency about the chemical contents of products and processes, as well as the creation and maintenance of an information matrix presenting what is known about the hazard traits of all of the chemicals in use or proposed for use in California. This tool needs to be designed to meet the needs of businesses that buy chemicals to make products or products that contain chemicals, the public, workers, and government agencies to enable them to compare different chemicals, choose or develop low- or no-hazard alternatives, and make proper decisions on necessary protections.

#### **7. Provide for Consolidated Data on Chemical Use in California**

Data about the chemicals used and released by facilities in California is scattered into several data systems in the state. These data systems need to be integrated and put into an electronic form. Additional data gaps should be identified and remedied.