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Special Issue: Designing a Chemically Safer Future

INTRODUCTION

A VISION FOR SAFER CHEMICALS: POLICY, MARKETS, COALITIONS, AND SCIENCE

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The problem of toxic chemicals and their adverse impacts on health and the environment, from production through disposal, is not new; however, our approach to solutions has evolved over time. For decades, those working to address chemical issues largely focused on identifying, characterizing, and controlling only the most hazardous chemicals. Ultimately, these efforts have not adequately succeeded at ensuring that all chemicals are developed, used, and managed in ways that are safe and healthy for people and the environment.

Over the last several years, leaders in government, business, advocacy organizations, and academia have begun to envision a new approach. Instead of attempting to assess and regulate each hazardous chemical as problems arise (what might be termed a problem-based approach), we are beginning to think about how to transition to safer alternatives (a solutions-oriented approach). We think of chemicals as part of the solution to a design problem, rather than chemicals as the problem itself. We think not only about the characteristics of chemicals that make them inherently hazardous, but also those that make them more benign. We embrace the need to perform particular functions of chemicals, but in ways that minimize impacts to human health and the environment. We recognize that tradeoffs associated with alternative options throughout their entire lifecycles will always exist and must be considered in substitution decisions. We understand that resource-intensive chemical regulations cannot alone address the tens of thousands of chemicals on the market or spur the transition to safer alternatives.

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VISION FOR A SAFER CHEMICALS FUTURE

A burgeoning sustainable production movement has been exploring new solutions to our problem of having toxic chemicals as the basis for our economies and the materials of our infrastructures. We need to develop our capacity, tools, and collaborations to transition to safer chemicals, industrial processes, materials, and products. We realize that we will still need to adequately address the legacy of damage that toxic chemicals have caused workers, communities, and ecosystems, and we will still need to respond to chemical problems as they arise. However, we hope that through a fundamental transition of the chemical enterprise we will be able to prevent such damage from occurring in the future.

ACHIEVING A SAFER CHEMICALS FUTURE

The goal of this issue of *New Solutions* is to bring together leading voices from various perspectives in order to highlight the widely agreed-upon need for the development and use of safer chemicals in our modern society. The authors illustrate how forward-thinking governments, businesses, and non-governmental organizations (NGOs) are already successfully working toward this objective by changing policy, shifting markets, building new coalitions, and transforming science, as detailed in the four sections of the issue.

Changing Policy

Bold, visionary chemicals management policies that promote the transition to safer alternatives are a key foundation for achieving a safer chemicals future.

The issue begins with the presentation of a new, ambitious vision for chemicals policies. Ken Geiser outlines the components of and describes the need for comprehensive chemicals policies that work within a systems framework, ensure adequate information flows through supply chains, phase out the most hazardous chemicals, progressively transition away from the remaining chemicals of concern by substituting safer chemicals and technologies, and invest heavily in a new generation of safer and more sustainable chemicals.

The next two articles detail various efforts at the local, state, and federal levels that attempt to advance this vision. Debbie Raphael and Chris Geiger detail the implementation of the City and County of San Francisco's Precautionary Principle Policy, which allows local government officials to act on early warning signs of harm. In effectuating this broad policy mandate, the City and County utilize a wide array of policy tools in order to evaluate the necessity of certain products and services, to look upstream in the chain of commerce to influence the design or products entering its local borders, and to promote the identification and use of safer alternatives.

Michael Belliveau examines the influence of recent state chemical policy reform developments on current efforts to reform obsolete federal chemicals

management laws. Over the last decade, state efforts have modeled a chemical policy framework to phase out unnecessary dangerous chemicals in favor of safer alternatives. By recapping this development, the article illustrates how the success of such efforts at the state level spurred the integration of hazard-based, substitution-driven thinking into current federal reform discussions.

Shifting Markets

Many forward-thinking businesses, in response to both regulatory and consumer pressures, are re-evaluating and reconsidering their approaches to supply chain management and product design. As Mark Rossi and colleagues demonstrate, businesses are not doing this work in isolation, but rather are engaging with a variety of stakeholders to achieve their goals. They detail how businesses and environmental organizations are collaborating to define and implement a proactive agenda for integrating safer chemicals into products. Together businesses and environmental organizations are charting a path to safer chemicals by sharing best practices, addressing technical aspects of safer chemicals substitution, and analyzing and supporting public policies that advance the rapid development and diffusion of greener chemicals in the economy.

Roger McFadden describes steps that one company, Staples, Inc., is taking to meet demand for products that are safer and more sustainable. These efforts include the implementation of a comprehensive and rigorous sustainable product design model to eliminate chemicals of concern at the design stage, as well as a strategy for the disclosure of bad actor chemicals in products supplied to the company. Although better chemicals management presents many new business opportunities, the article highlights the significant barriers the company faces in meeting the demand for safer and more sustainable products and presents some ways in which new collaborations and tools are helping the company to overcome these barriers.

Building New Coalitions

Often, environmental advocates, public health advocates, labor advocates, NGOs, and government officials work toward similar goals on parallel fronts, rather than through united efforts. The next two articles demonstrate how new coalitions, which bring together these constituencies, are successful in advancing the transition to safer chemicals.

Joe DiGangi describes how public interest NGOs combine their own vision for a toxics-free future with the objectives of multilateral environmental agreements to directly tackle chemical safety problems and push for a safer future. The article provides a number of examples where groups have effectively leveraged global chemicals agreements to advance chemical safety activities on the ground at the national level.

Andrew King highlights the development of a new coalition, integrating experience and expertise from community activism, environment, labor, public health, politics, and cancer prevention, to formulate a common strategy to address the continuing use and dissemination of toxic chemicals in Canada. Through these efforts, a first-in-the-country right-to-know bylaw was enacted in Toronto.

Transforming Science

New science is critical to advancing ambitious chemicals policies and shifting markets in the direction of safer alternatives. The four articles in this section describe some of the ways in which new scientific thinking helps to support a safer chemicals future.

Richard Clapp describes how the 2008–2009 President's Cancer Panel report provides official recognition of the significant contribution of environmental and occupational exposures to cancer etiology, thereby validating and reinforcing decades of efforts by advocates, scientific associations, and scientists documenting evidence of the environmental and occupational links to cancer and the need to prevent such exposures.

Rachel Massey and colleagues highlight the advances made in chemical categorization and prioritization under the Massachusetts Toxics Use Reduction Act. The article demonstrates how the use of statutory authority to designate Higher and Lower Hazard Substances has spurred the transition to safer alternatives.

Lothar Lissner and Dolores Romano underscore the importance of the systemic description and promotion of substitution options and processes for chemicals management and chemicals policy. The article details: the necessary role of substitution in chemicals policy; existing tools and methods for substitution; barriers to substitution; and new efforts designed to overcome these barriers.

Amy Cannon and John Warner discuss the transformative science of green chemistry and its capacity to invent safer chemicals, products, and processes. Although green chemistry and chemicals policy go hand in hand, the authors caution against the conflation of the two. They argue that as most alternative technologies do not yet exist, innovative solutions must be invented in order for chemical policies directing the use of safer alternatives to be successful. To spur the development of these solutions and advance the science of green chemistry, investments in research and development as well as educational reform efforts are necessary. Obviously, new government policies for industrial development will be needed to drive these investments.

Finally, the issue includes a document developed by The Gulf Future Campaign of the Gulf Restoration Network. This campaign was created shortly after the BP Deepwater Horizon oil disaster of 2010, with a mission of providing the long-term support needed to protect the environment and the distinct

culture of the Gulf Coast for future generations. This is a sharp reminder of why we need a safer chemicals future.

As this collection of articles describes, achieving a safer chemicals future requires that we rethink old ways of addressing chemical problems. This, in turn, will require major transformations of policy, markets, coalition-building, and science. Without advances in each of these areas, it will be difficult, if not impossible, to ensure a timely transition to safer chemicals, materials, products, and processes. It is up to each of us to determine what role we can play in making this transition a reality.

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