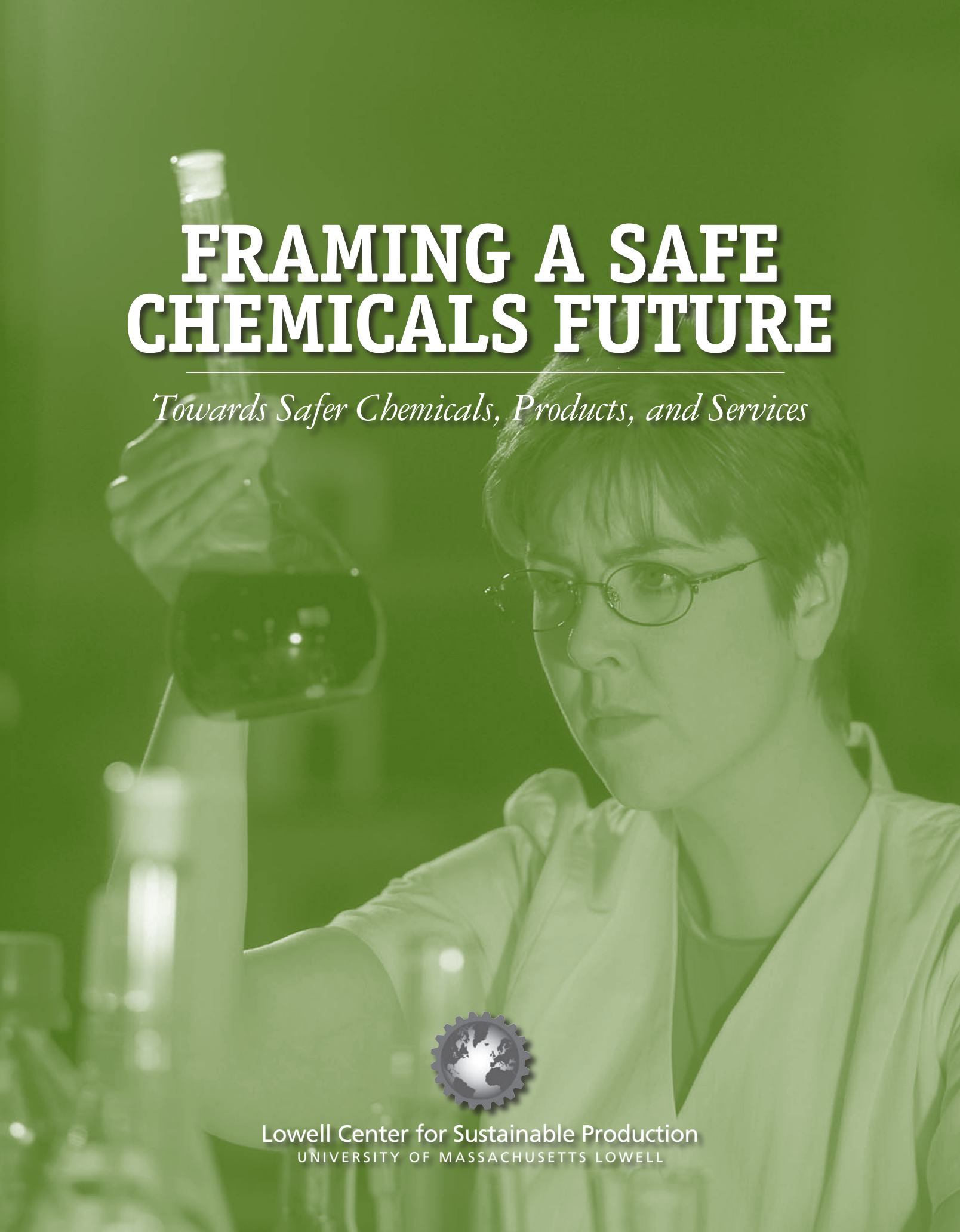
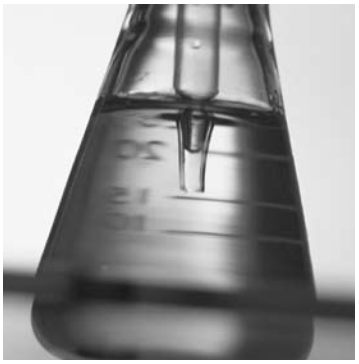


FRAMING A SAFE CHEMICALS FUTURE

Towards Safer Chemicals, Products, and Services

Lowell Center for Sustainable Production
UNIVERSITY OF MASSACHUSETTS LOWELL

Change is Happening



Around the world, forward-thinking businesses, governments, and non-governmental organizations (NGOs) are beginning to think differently about chemicals and their management. The conventional frameworks for chemicals management policy established in the 1970s are being challenged, reconsidered, and revised to ensure that businesses and industries are innovative, versatile and competitive; that good jobs remain; and that protections for the natural environment and the health and well-being of people are strengthened.

During the past 50 years, thousands of chemical substances have been developed and put into commerce. These modern chemicals enhance our quality of life, yet many of these chemical substances also present environmental and public health dangers. For a large percentage of these chemicals, there is little information on their potential environmental and health impacts, volumes, movement through the economy, or potential human exposures.

For the large percentage of chemical substances in commerce, there is little information on potential environmental and health impract, volumes, movement through the economy, and potential human exposures.

New and existing chemicals have been treated unequally in most regulatory systems. While new chemicals receive modest health and safety reviews, there is little regulation or health and safety data required for existing chemicals that have been in commerce for decades; yet these chemicals continue to make up more than 90 percent by volume of those in use today. When concerns arise about chemicals, government risk assessment and management processes have proven to be too slow and inefficient and too often fail to promote safer alternative options.

Most countries have lacked an integrated, modernized, and forward-looking approach to chemicals management, and there has been little incentive to develop safer chemicals and products. Meanwhile, public concern about chemicals has been increasing while public confidence in government and industry has been decreasing.

In small and important ways, conditions are beginning to change, creating exciting opportunities for reform and innovation. Private businesses are being held increasingly accountable for the economic, social, and environmental consequences of their chemical choices. A growing awareness of the potential impacts on health and ecosystems from chemicals is driving an ever more environmentally conscious marketplace. New international regulatory initiatives are encouraging companies to implement more aggressive assessment and management efforts that include addressing how chemicals are managed throughout product life-cycles:

- The European Union is currently finalizing a new chemicals policy called REACH (Registration, Evaluation and Authorization of Chemicals), which will require data submission for most chemicals in commerce and restrictions for those of highest concern.
- Private companies, such as Interface and SC Johnson, are using health and environmental criteria to screen chemicals used in their manufacturing processes to develop commercially viable products with reduced health and environmental impacts.
- US states, such as Massachusetts, are working closely with companies using chemicals to identify opportunities to reduce hazardous chemicals use and identify safer substitutes.
- The UN is finalizing a Strategic Approach to International Chemicals Management that will serve as an integrated blueprint for safer chemicals management worldwide.
- Over 60 environmental and health organizations in the United States have endorsed

the *Louisville Charter*, an environmental movement statement outlining six principles for a more sustainable chemical policy. In Europe, a similar statement, the *Copenhagen Charter,* represents a common vision of the environmental movement there.

The time has come to begin a broad discussion across a wide range of stakeholders about the limits of current chemicals management policies and the need to develop policies and tools that promote innovation in cleaner and safer chemicals. To initiate this process, the Lowell Center for Sustainable Production hosted a multi-stakeholder Forum on Framing a Future Chemicals Policy in Boston from April 28–29, 2005. The forum brought together chemical producers, product manufacturers, representatives of government and non-government organizations, and others for discussions on key elements of a future chemicals policy. The forum focused on the current realities and on how the creativity and imagination of leading thinkers could structure new approaches for a more sustainable chemicals future. This short report provides an overview of the discussions at that forum and presents options that were considered useful avenues for further development.

Defining the Goal and Elements of a Sustainable Chemicals Policy

While past discussions on chemicals policy reform have often been contentious, most stakeholders share some common goals. Most would agree with the "Generational Goal" of the 1992 Johannesburg Summit on Environment and Sustainable Development to:

"Renew the commitment…aiming to achieve, by 2020, that chemicals are used and produced in ways that lead to the minimization of significant adverse effects on human health and the environment...[and] that threats posed by toxic chemicals should be eliminated within one generation."

This goal encourages creative thinking about the design of a future chemicals economy that solves the problems of the past while stimulating future innovation for safer chemicals and products. Some of the practical results of achieving such a goal could include:

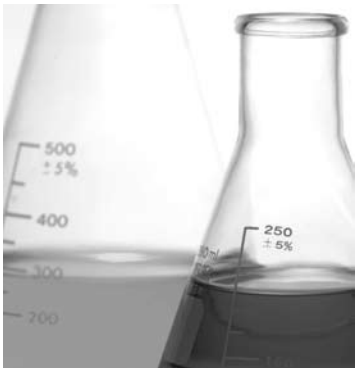
- businesses and industries that are innovative, versatile and competitive;
- products that are safe, functional and highly valued;
- a natural environment that supports the health and well being of children, adults, wildlife and ecosystems; and
- good, healthy jobs in sustainable industries.

In order to achieve the Generational Goal, new chemicals policy efforts should incorporate a number of critical elements. These include:

- developing and sharing information about chemicals, their properties, exposure, effects, and movement through commerce and the environment;
- moving toward green chemistry and safer product design through the promotion of research and innovation, and through the integration of new chemicals management procedures into existing business processes; and
- establishing norms for the safe management of chemicals.

Ultimately, a sustainable chemicals policy will require that these elements be integrated into the very fabric of government, industrial, and consumer decision-making and that environmental and health considerations become as important factors in chemical and product design as cost and functionality.

Here is How



Spurred by scientific, market, and political forces, governments, businesses, and advocates are reexamining their approaches to chemicals management. Many have begun to implement change in their areas of influence and to call for wider, more fundamental changes in policies and institutions.

GOVERNMENT INITIATIVES

Canada

The implementation of the Canadian Environmental Protection Act of 1999 (CEPA) includes an obligation of the government to systematically review and assess the environmental and health impacts of 23,000 chemicals already in commerce.

Sweden

One of the main goals of the 1999 "Swedish Environmental Quality Objectives" is to achieve a "non-toxic environment." To achieve this, the government concluded that testing must be completed for every potentially harmful chemical by 2010 if it is to be allowed to stay on the market. Policies must also address the hazards associated with the use of chemicals in commercial products and ensure that certain chemicals with particularly harmful qualities are phased out over time. The Swedish government has developed specific policy tools, such as one called "Prio", to help firms identify hazardous chemicals in their products and begin the process of finding safer alternatives.

OECD

The Organization for Economic Cooperation and Development (OECD) is promoting the development and use of new, more efficient methods to screen and assess chemicals and is coordinating international work on the hazard assessment of 4,100 high production volume chemicals among governments and industry.

US EPA

Due to limitations in its ability to regulate chemicals already in commerce, the United States Environmental Protection Agency (EPA) has relied heavily on a range of voluntary initiatives to achieve chemical testing and management goals. For instance, in the High Production Volume Challenge and the Voluntary Children's Chemical Evaluation Program, chemical manufacturers voluntarily agree to test and provide information on substances of concern. With its Design for the Environment program, EPA works directly with industry and other stakeholders to identify and develop innovative approaches for meeting the technological needs of industry, while taking full account of health and environmental concerns. EPA has developed a series of policy tools to help industry design safer chemicals and assess their hazards, including the P2 (Pollution Prevention) Framework and the PBT (Persistent, Bioaccumulative and Toxic) Profiler.

US States

Traditionally, states have been innovators in environmental policy in the United States. Chemicals policy is no exception. State restrictions on DDT, PCBs (polychlorinated biphenyls), CFCs (chlorofluorocarbons), and some PBDEs (polybrominated diphenyl ethers used as flame retardants) all pre-date federal action. Since 1989, 19 states have passed model legislation to phase out toxic chemicals used in packaging. Since 1990, 23 states have passed legislation to limit and phase out the sale and use of mercury in various consumer products. Massachusetts and New Jersey have highly successful mandatory pollution prevention programs. For example, the Massachusetts program has resulted in a statewide reduction in the use of the solvent trichloroethyelene—TCE—from almost 2.5 million pounds per year to 25,000 pounds per year. Other states and localities have established voluntary and mandatory programs to reduce the use of persistent, bioaccumulative toxins (PBTs). Cities

REACH

The European Union is currently finalizing a new policy framework for the Registration, Evaluation and Authorization of Chemicals (REACH), which would create a single system for both existing and new chemicals. Manufacturers and importers of more than one ton per year of a chemical will be required to submit a registration dossier, with the amount of information needed increasing as production or import volumes increase. This information must include physical-chemical properties as well as toxicity characteristics. For chemicals produced or imported at 10 tons or more per year, firms must prepare a chemical safety report which describes how to achieve "adequate control" of risks for all identified uses. A selection of chemicals of particular concern will be evaluated by various European countries in order to verify the calculations made and to identify any risks that are not adequately controlled. Risks that are not adequately controlled may lead to regulatory restrictions on the use of the substance. In addition, chemicals of very high concern will be prioritized and then enter an authorization process where users must apply for permission to continue their use. This permission may be refused if the risk from the use is not adequately controlled or a safer alternative is available. It is expected that the REACH legislation will be finalized by 2007, with its entrance into force soon thereafter.

such as San Francisco and Seattle are revamping their purchasing policies to encourage the safest feasible products to meet city needs. While most of these efforts are too focused on single chemicals to effect any fundamental shift in their broader regulatory programs, it is likely that these state and local efforts will provide the impetus for future federal policy reforms.

BUSINESS INITIATIVES

Business managers at every step in their supply chains (the chain of production from raw material, to product production, to retail) are beginning to rethink their approaches to chemical development, selection, use, and management. Through cooperative private/public initiatives, such as the US EPA's formulators and fire retardancy initiatives, companies along supply chains are engaging in discussions to identify and implement safer, high performing products and processes.

Chemical and pharmaceutical manufacturers such as Pfizer, Rohm and Haas, and Supresta, through their own efforts and in cooperation with industry trade groups, have invested in the research and development of green chemistry approaches to a wide variety of products.

Many manufacturers of products that use chemicals as raw material inputs, such as Herman Miller, Interface, Shaw Carpets, Coastwide Labs, and SC Johnson, screen the chemicals that they purchase, and reduce or eliminate the more problematic ones.

Business managers at every step in their supply chain are beginning to rethink their approaches to chemical development, selection, use, and management.

Other businesses, such as the healthcare purchasing group Consorta and the healthcare provider Kaiser Permanente, as well as government agencies, include stipulations in their procurement contracts, excluding products with chemicals that are considered hazards to public health or the environment.

Green Chemistry

Green chemistry is the design of chemical products and processes that reduce or eliminate the use and generation of hazardous substances throughout production, use, and disposal. This definition is often augmented by a list of 12 Principles of Green Chemistry developed by Paul Anastas and John Warner. The principles include:

1. **Prevention:** It is better to prevent waste than to treat or clean up waste after it has been created.
2. **Atom Economy:** Synthetic methods should be designed to maximize the incorporation of all materials used in the process into the final product.
3. **Less Hazardous Chemical Syntheses:** Wherever practicable, synthetic methods should be designed to use and generate substances that possess little or no toxicity to human health and the environment.
4. **Designing Safer Chemicals:** Chemical products should be designed to effect their desired function while minimizing their toxicity.
5. **Safer Solvents and Auxiliaries:** The use of auxiliary substances (e.g., solvents, separation agents, etc.) should be made unnecessary wherever possible and innocuous when used.
6. **Design for Energy Efficiency:** Energy requirements of chemical processes should be recognized for their environmental and economic impacts and should be minimized. If possible, synthetic methods should be conducted at ambient temperature and pressure.
7. **Use of Renewable Feedstocks:** A raw material or feedstock should be renewable rather than depleting whenever technically and economically practicable.
8. **Reduce Derivatives:** Unnecessary derivatization (use of blocking groups, protection/ deprotection, temporary modification of physical/chemical processes) should be minimized or avoided if possible, because such steps require additional reagents and can generate waste.
9. **Catalysis:** Catalytic reagents (as selective as possible) are superior to stoichiometric reagents.
10. **Design for Degradation:** Chemical products should be designed so that at the end of their function they break down into innocuous degradation products and do not persist in the environment.
11. **Real-time Analysis for Pollution Prevention:** Analytical methodologies need to be further developed to allow for real-time, in-process monitoring and control prior to the formation of hazardous substances.
12. **Inherently Safer Chemistry for Accident Prevention:** Substances and the form of a substance used in a chemical process should be chosen to minimize the potential for chemical accidents, including releases, explosions, and fires.

In 1990, President Clinton introduced the Presidential Green Chemistry Challenge Awards to recognize leading firms and researchers. This program has now been replicated in Australia, Italy, Japan, Spain, and the United Kingdom. The Green Chemistry Institute, born from a partnership between EPA and the American Chemical Society, promotes research, education, and the sharing of information among stakeholders. There are now 30 similar institutes in 30 other countries. Educational materials developed through an EPA and American Chemical Society partnership ensure that green chemistry innovations are being incorporated into college students' chemistry education. In addition, EPA works with companies to integrate green chemistry considerations into new chemicals design.

While EPA has been a leader in promoting green chemistry, its implementation in practice has suffered from a general lack of funding. Passage of the Green Chemistry Research and Development Act, now being considereded in Congress, will elevate the importance and funding for green chemistry efforts.

INITIATIVES FROM THE NON-PROFIT SECTOR

The non-profit sector has launched efforts to change public policy and encourage firms to transition to safer chemicals. The successful Health Care without Harm Campaign, a coalition of more than 400 environmental advocates, health professionals, and hospital organizations has worked with medical device manufacturers, hospitals, and purchasing agencies to encourage the substitution of potentially problematic chemicals used in the medical sector. Other advocacy coalitions, such as the Computer Take Back Campaign and the Healthy Building Network, are working within specific sectors to influence industrial and government policy towards safer materials. In May 2004, United States-based environmental and health groups convened in Louisville, Kentucky with the goal of developing guiding objectives for chemical policies and campaigns that protect human health and the environment. Meeting participants drafted a statement—now known as the *Louisville Charter*—that calls for fundamental reform to current chemical laws. The charter includes six guiding objectives:

- require safer substitutes and solutions;
- phaseout persistent, bioaccumulative, or highly toxic chemicals;
- give the public and workers the full right to know and participate;
- act on early warnings;
- require comprehensive safety data for all chemicals;
- take immediate action to protect communities and workers.

Advocacy coalitions are working within specific sectors to influence industrial and government policy towards safer materials.

Today, the Charter has been endorsed by over 60 environmental and public health organizations. More information on the charter is available at *www.louisvillecharter.org*.

SC Johnson

"The Greenlist™ process has produced products that are better for the environment, good for our consumers, and good for business." **David C. Long, Sustainable Innovations Manager**

SC Johnson is a family-owned company that manufactures a variety of consumer products, including Ziploc containers, Windex glass cleaner, and Off! insect repellent. The company's CEO, Fisk Johnson, established its Greenlist initiative to reduce the environmental "footprint" of SC Johnson products. Greenlist is a process that compares the environmental and biological impacts of chemical choices, ranking them as "best," "better," "acceptable," or "restricted use material." Using results from Greenlist, SC Johnson reformulated Windex Blue Glass Cleaner, eliminating one million kilograms of VOCs while improving product performance and increasing sales by eight percent. Overall, the company has eliminated over 11 million kilograms of less desirable material and increased the use of materials it rated "better" or "best" by 13 million kilograms. However, despite these successes, the company has struggled to obtain adequate data on chemical toxicity from suppliers and as a result must conduct many of its own analyses.

Consorta

"Lack of a chemicals policy creates a burden for users. Policy change at the national level will relieve this burden on healthcare organizations." **John Strong, President and CEO**

Consorta is a corporation and the purchasing cooperative for thirteen Catholic health care systems, with an annual purchase volume of approximately $4.1 billion. Consorta is committed to "conduct business in a socially responsible and ethical manner that protects the safety of its employees, and its shareholders' patients and employees, as well as the environment."

To meet this goal, it has prioritized chemicals of concern and requires disclosure of their presence in products when evaluating potential suppliers. In five years, Consorta has established 67 contracts with environmentally preferred products.

Obtaining information on chemicals in products has proven challenging. Suppliers themselves often do not know the composition of finished products, since so many manufacturers are involved in the supply chain. Consorta has found that the lack of a strong national chemical policy creates a burden for healthcare organizations, which must operate in uncertainty and face potential liability from the use of hazardous materials.

The Challenges That Lie Ahead

Resolving Key Issues in Framing a Future Chemicals Policy

If we are to meet the Generational Goal and eliminate the threat posed by toxic chemicals in one generation, many challenges remain. Increased information about chemicals, the increased development and use of green chemistry, and the establishment of norms for the sound management of chemicals will be key elements of a more sustainable chemicals policy. While there are considerable differences of opinion around how to implement these elements, there are also solid areas of common ground.

DEVELOPING, ACCESSING, AND SHARING INFORMATION

Information is critical for helping the public to understand and act on risks and for businesses to develop safer and cleaner alternatives. There remain significant information gaps on chemicals, including chemical properties, effects on human populations, including workers, effects on ecosystems, and alternatives. Information is also lacking on how chemicals are used, the efficiency with which they are used, where and in what volumes they move through commerce, possible exposures throughout product lifecycles, and what opportunities there are for preventative interventions. Of most concern, the recent

natural disasters in the United States have revealed that during emergencies no system exists to provide ready access to appropriate chemical information at the appropriate time by those who need it most.

Mechanisms are needed to develop and communicate this information. In particular, strategies are needed to improve information flow throughout supply chains and lifecycles of products. Such information flow is critical to ensuring that manufacturers and others using chemicals have adequate information to ensure their safe use and an ability to select safer chemicals for specific purposes. A wide range of views exists regarding just how much and what type of information is necessary, for

New Tools for Assessing Safer Chemicals and Products

Stakeholders increasingly need tools to determine the relative safety of a particular chemical or product. Without such knowledge, it is difficult to know whether a particular alternative is indeed safer, potentially leading to unintended impacts of substitution. While more work is needed in this area, during the past several years government agencies, academic institutions, and businesses in the U.S. and Europe have actively developed new tools to assess and compare alternatives. In addition to the SC Johnson Greenlist, and the US EPA's P2 Framework, these include:

The Column Model: **Developed by the Institute for Occupational Safety (BIA) of the German Federation of Institutions for Statutory Accident Insurance and Prevention, the Column Model presents data on chemical hazards in a tabular format. Using European Union Risk phrases (R-phrases), the criteria for each cell in the table are determined primarily by risk factors. The Column Model creates a framework for presenting data by hazard category and potential risk level. The columns are six hazard endpoints: acute health risk, chronic health risk, environmental risk, fire and explosion, liberation properties, and risks by technology.**

Quick Scan: **Developed by the Dutch Ministry of Housing, Spatial Planning and the Environment, the "Quick Scan" method is a voluntary tool for companies to rapidly assess chemicals in the absence of data, to prioritize for further study and action. The steps in the Quick Scan method are: gather hazard data on chemicals; use criteria to assign chemicals to hazard levels; use decision making rules to determine concern categories; and revise concern categories based upon use data. Similar to The Column Model, Quick Scan specifies criteria for determining hazard levels of a chemical for specific hazard endpoints.**

Pollution Prevention Options Analysis System (P2OASys): **Developed by the Massachusetts Toxics Use Reduction Institute, P2OASys is a tool to assist companies in comparing options for toxics use reduction on the basis of their acute and chronic human toxicity, physiological impacts, ecological effects, lifecycle impacts, and physical characteristics. It converts data for each hazard category into a numeric scale of 2, 4, 6, 8, or 10—allowing comparison of hazard trade-offs across options. P2OASys works on the basis of a maxi-min principle, meaning that the highest (most problematic) hazard value dominates any category of analysis**

Materials Assessment Protocol: **McDonough Braungart Design Chemistry (MBDC)—working with a range of companies—has defined a method for transitioning towards safer materials and products, called the "Materials Assessment Protocol." At the heart of MBDC's materials assessment protocol is its "chemical assessment" screening tool, which screens chemicals into categories of green, yellow, red, and orange depending upon the hazards associated with the chemicals. Companies like the furniture maker Herman Miller begin with MBDC's chemical assessment tool to evaluate the chemical hazards of a material, extend it to include recyclability and recycled/renewable content at the material level; and then extended to the product level to include disassembly.**

Interface

"The fastest way that you are going to achieve progress on chemical management is to educate and influence the marketplace." **Wendy Porter, Environmental Management Director**

Interface, Inc., a major carpet and textiles manufacturer, has undertaken two review processes to prioritize the chemicals they use. In its first review, the company relied on material safety data sheets (MSDS), which it found frustrating. MSDSs provide information on products as they relate to worker safety and minimum OSHA requirements. This information was inadequate for the company's needs. Further, information that was provided was of poor quality and the chemical manufacturers were reluctant to provide additional information and support.

In its second review, Interface required suppliers and vendors to disclose all ingredients. Using an interdepartmental team and a labor-intensive process, the company then decided which chemicals it would use and which it would avoid. The company has developed a product line using entirely screened chemicals that saves $300,000 annually in chemical costs. Interface has educated the marketplace about its work and the choices this affords the customer, thereby creating further value for its efforts.

whom, in what form and for what purpose, and whose responsibility it should be to generate and disseminate the information.

Information serves no purpose if it not used. Right-to-know efforts in the United States have demonstrated the power of public information as a driver to promote pollution prevention. As such, provision of information needs to be an active requirement of firms. Chemical producers are those best situated for generating data on the health and environmental effects of their products and understanding how those products are distributed and used in commerce. While such public provision of information needs to be balanced with protection of legitimate confidential business information, trade information protections should not occur at the expense of public health.

Transparency regarding the properties and use of chemicals, and the content of products is vitally important in enabling stakeholders to make informed decisions. Communities that host facilities that make or use chemicals need science and business information to maintain effective discussions with local companies. Production managers and their workers that use chemicals need information to decide whether and how to switch to more benign inputs. Clear, simple labels could serve both to help educate consumers to make wise choices and to recognize leading manufacturers.

MOVING TOWARDS GREENER, SAFER CHEMISTRY AND PRODUCTS

There is widespread agreement that designing chemicals to meet certain functional requirements while remaining benign to environmental and human health is highly desirable. However, budgets to support green chemistry and safer product design are minimal. A significant increase in funding is needed to establish and strengthen mechanisms that support the development and use of green chemistry solutions.

Legislation and market forces can promote willingness to embrace technological innovation by forcing data collection and action on particular chemicals and by instituting a culture of sustainable chemicals management. Through regulation, government can set minimum standards for businesses and prevent less innovative companies from undermining leaders. Government can also require firms to institute comprehensive planning processes to consider the implications of substitution or reduction for chemicals of high concern on process and product design.

More than willingness, the capacity to change, supported by technical assistance, information, and research support, is often as important or more important for stimulating innovation. Government should provide support through:

- education, training, and outreach on substitution methods and development of tools to assist firms and others in analyzing the pros and cons of alternative chemicals;
- research and development funding for safer substances;
- direct technical support to firms for substitution; and
- recognize leading companies and research.

A comprehensive effort should be made to provide education about chemistry and the relationship of chemicals in commerce to environmental and human health, and about green chemistry in particular. Education is needed at all levels, including kindergarten through 12th grade, college, and professional, as well as teacher education. Technically sound curriculum development based on chemistry, engineering, and the health sciences is necessary before any large-scale teaching effort can take place.

ESTABLISHING NORMS FOR THE SOUND MANAGEMENT OF CHEMICALS

New and innovative local, state, and national policies are critical to framing how decisions should be made concerning hazardous chemicals, including the collection, analysis, and dissemination of data on chemicals, the restriction of chemicals of concern, and incentives for safer chemistry. International cooperation will also be necessary to achieve the goal of sound management of chemicals, since chemicals are traded internationally and their potential impacts do not respect national boundaries. The industrialized nations share responsibility for the assessment and prevention of the risks of new and existing chemicals in commerce, and the high production volume chemical data collection efforts in Europe, Canada, and the United States offer a partial solution to this problem.

The United Nations Environment Program Governing Council is finalizing a plan for a Strategic Approach to International Chemicals Management (SAICM). SAICM is an opportunity to advance the international sound management of chemicals through the coordination of multi-lateral agreements, funding agencies, and capacity-building efforts. A key feature of SAICM is that all stakeholders have been brought to the table in an effort to develop a shared sense of responsibility. SAICM will consist of an overarching policy strategy, a global plan of action, and a high-level declaration.

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The OECD New Chemicals Task Force is undertaking a pilot of Mutual Acceptance of Notifications (MAN). MAN would allow companies to submit one notification (assessment dossier) and then, after national review and assessment of the risks, market anywhere. This parallel process would facilitate the more efficient introduction of new chemicals to the marketplace and improve decision making.

The Globally Harmonized System of Classification and Labeling of Chemicals (GHS) integrates the technical work of three organizations: the International Labor Organization, the Organization for Economic Cooperation and Development, and the United Nations Committee of Experts on the Transport of Dangerous Goods. GHS is a voluntary system that provides a platform upon which countries can build their own chemical safety programs. The GHS includes:

- criteria for characaterizing the intrinsic hazards of chemicals;
- classification processes that use available data on chemicals and compare it with defined hazard criteria; and
- and tools for communication on labels and safety data sheets.

Commitment to adopt GHS is widespread. Countries are conducting detailed analyses to determine what will be required to implement GHS within existing legal frameworks. Because it is hoped that GHS will facilitate trade and promote the sound management of chemicals, implementation will require long-term collaboration with international organizations, industry, and labor.

About This Report

Modern chemicals are essential to our food, our health, and our lifestyle. Countries around the world are engaged in the debate on how to create policy that will allow for the sustainable use and management of chemicals. Change across business, in government, and in non-government organizations is already underway, stimulated and spurred on by forward-thinking individuals from diverse backgrounds.

Lessons from the past three decades of chemicals policies reveals that it is time to update the way we think about and regulate chemicals. We have come a long way in our science and technologies. We know a lot more about the environmental and human health effects of chemicals and we have much more experience in changing industrial processes and substituting chemicals. We need not be timid or hesitant in thinking about major transformations of the chemicals policies that have guided us to this point. Through open dialogue among many stakeholders and innovative experiments at the state level and among leading firms we can begin to sketch the outlines of better chemicals policies for the future. While we should respect that there are many views on how to move forward, we must agree to move forward. Achieving a sustainable chemicals future in one generation is a worthy challenge, but it requires that we get on with the task now. For more information, see the Lowell Center for Sustainable Production Chemical Policy Initiative website at http://chemicalspolicy.org/.

About the Chemicals Policy Initiative

The Chemicals Policy Initiative is a project of the Lowell Center for Sustainable Production (LCSP) at the University of Massachusetts, Lowell. Our objectives are to:

- Significantly advance policy debate on reforming chemicals policy in the United States, proposing model solutions and new collaborations, all with a positive focus on sustainable chemicals management.
- Assist in the development of sustainable chemicals management outside the US, in both developed and developing world.
- Encourage the development and use of safer alternatives by creating and promoting a comprehensive framework for alternatives assessment.
- Identify tools and appropriate ways of assisting green chemistry innovation and safer supply chain management of chemicals.

The Chemicals Policy Initiative closely collaborates with the Toxics Use Reduction Institute, which is also based at the University of Massachusetts, Lowell.

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