



State Leadership in Formulating and Reforming Chemicals Policy

ACTIONS TAKEN AND LESSONS LEARNED



Lowell Center
for Sustainable
Production

UNIVERSITY OF MASSACHUSETTS LOWELL

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The Lowell Center for Sustainable Production at the University of Massachusetts Lowell

The Lowell Center for Sustainable Production uses rigorous science, collaborative research, and innovative strategies to promote communities, workplaces, and products that are healthy, humane, and respectful of natural systems. The Center is composed of faculty, staff, and graduate students at the University of Massachusetts Lowell who work collaboratively with citizen groups, workers, businesses, institutions, and government agencies to build healthy work environments, thriving communities, and viable businesses that support a more sustainable world.

This report was produced by the Lowell Center for Sustainable Production's Chemicals Policy Initiative, whose objectives are to significantly advance policy dialogue on reforming chemicals policy in the United States; assist in the development of sustainable chemicals management outside of the U.S.; encourage the development and use of safer alternatives by creating and promoting a comprehensive framework for alternatives assessment; and identify tools and appropriate ways of assisting green chemistry innovation and safer supply chain management of chemicals.

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EXECUTIVE SUMMARY

State Leadership in Formulating and Reforming Chemicals Policy: Actions Taken and Lessons Learned

In the United States, states have historically taken a leadership role in innovations in environmental and health policies. Chemicals policy is no exception. In the absence of federal leadership in reforming the 30 year old Toxic Substances Act, several states have initiated broad reforms of chemicals regulation. These reforms are occurring in response to a number of important drivers including new regulations from Europe, advocacy group pressures, local impacts of chemicals, and changes in business practice.

This report examines states' emerging leadership in reforming the way chemicals in commerce are managed and analyzes chemicals policies that have been proposed or implemented at the state level.

States have enacted and proposed a broad range of chemicals policies over the past twenty years. To analyze state chemicals policies, the Lowell Center for Sustainable Production (LCSP) developed a database of state and local legislative and executive branch chemicals policies compiling data from 1990 to the present. Over 900 policies representing a broad range of policy types were reviewed, including: (1) pollution prevention and toxics use reduction; (2) single chemical restrictions; (3) multiple chemical policies; (4) regulation of product categories; (5) biomonitoring and environmental health tracking and surveillance systems; (6) data collection; (7) right-to-know; (8) chemical prioritization; (9) alternatives assessment; (10) green chemistry and design for the environment; (11) product stewardship; (12) environmentally preferable purchasing; and (13) precautionary principle. The database can be found at <http://www.chemicalspolicy.org/uslegislationsearch.php>

States have been incubators of innovation in chemicals policy and much can be learned from their experience. Based on interviews with key experts at the state level, legislative research, and more than 15 years of practical experience in working with states and other stakeholders in developing, implementing, and assessing chemicals policies, several core lessons have been identified:

- A shifting focus of state chemicals policy. There has been a shift in state chemicals policy in recent years from single chemical restrictions or “toxics” policy to approaches that attempt to address multiple chemicals and their intrinsic hazards, “chemicals policy.” A critical element of this shift, to expedite decision-making and effectively apply limited resources, is a focus on rapid prioritization of chemicals based on hazards and use categories or exposure potential rather than lengthy and costly chemical-by-chemical risk assessment and management processes. Building on the historical successes of the

states in implementing pollution prevention policies in the early 1990s, there is a shift in state chemicals policy efforts from a more reactive “phase-out” approach to a more proactive “phase-in” approach.

- Experimentation with a myriad of policy types. While states are increasingly developing more coordinated chemicals policy initiatives, they continue to experiment with a myriad of chemicals policy options to drive safer products. These options include: using bans of single chemicals or classes of chemicals; using environmentally preferable purchasing; identifying safer alternatives to toxic chemicals; and using green chemistry.
- A wide range of drivers for chemicals policy reform. A broad range of actions on chemicals policy reform at the state and local level are being driven by longer term trends that have laid the foundation over time, as well as new drivers. Longer term trends include: a lack of federal oversight of chemicals in products and a significant lack of leadership in modernizing the Toxic Substances Control Act (TSCA); the development of new science on the health and ecosystem impacts of chemicals; and a rise in the economic costs to states of not taking action. New drivers include: an increase in public attention to chemicals in consumer products; a growing concern in business about the health effects of chemicals leading to the development of safer chemicals and products; and a rise in standards in chemicals policy created by new European, Canadian, and other state chemicals policy reform efforts.
- Significant barriers to state chemicals policy reform efforts. There are a number of important barriers to chemicals policy reform in many states, including: a lack of data on chemical toxicity, use in products, and availability and safety of alternatives; a lack of agency resources and capacity; a lack of intra- and inter-state coordination; and a difficulty in defining safer chemicals.
- States overcoming barriers and finding new collaborations. Despite barriers, several states are moving forward to reform chemicals policies in a more solutions-oriented, broader, and innovative manner. Three particular areas of future opportunities for states include: an increase in collaboration and coordination within and between states; an increase in public and private engagement in chemicals policy efforts; and an increase in chemicals policy reform that is based on the positive vision of safer alternatives. In this regard, states are realizing that a focus on identifying safer alternatives to chemicals of concern overcomes important barriers to change and can enhance the market viability of firms.

States are likely to continue to shape federal policy reform efforts, so it is incumbent on them to continue their critical role in influencing the development of integrated, solutions-oriented chemicals policy into the future.

INTRODUCTION

Chemistry and chemical products have provided enormous benefits to society – from medicines, to electronics, to advanced materials. However, throughout the past half-century, thousands of chemical substances have been developed and put into commerce, often with little information or consideration about their environmental or health implications. During the last several years, there has been increasing public concern about toxic chemicals in everyday products—lead in toys imported from China, flame retardants in computers and furniture, plasticizers in consumer products, bisphenol A in baby bottles, and so forth. Scientific studies are also revealing new evidence of the build-up of some chemicals in ecosystems and in human bodies, and new findings link exposures to hazardous chemicals to health effects ranging from cancer to asthma to learning disabilities. These problems demonstrate a failure of both chemical design and responsibility that is driving a new movement for chemicals policy reform among the states in the United States.

Historically, U.S. environmental policy is based on a model of participation of several governments in cooperative legislative or administrative action. Many of the federal environmental laws establish a framework in which the federal and state governments work together to protect health and the environment from the adverse effects of pollution-generating activities. In general, the federal government is responsible for promulgating standard-setting regulations while the states have the primary responsibility for implementing regulations. Further, in most instances, the states have the authority to adopt standards that are more stringent than applicable federal standards.¹

As a result, state governments play an important role in U.S. environmental policy. Chemicals regulation is no exception to this. In addition to implementing federal environmental laws, states and localities often address many environmental issues on their own, without a federal mandate. State and local officials, closer to the environmental and economic concerns of their residents than those of federal officials, possess the local knowledge and expertise needed to solve environmental problems, which are often local or regional in nature. States and localities also play a key role in policy innovation and in experimenting with new approaches to environmental protection, especially with respect to issues where federal action has failed to adequately address local concerns. For example, states and localities have an ability to establish policies and programs that transcend jurisdictional boundaries, addressing more than one category of chemical, i.e. industrial chemicals, pharmaceuticals, pesticides, nanomaterials, which are currently addressed through separate legislative and policy frameworks at the federal level.

With little federal initiative in the United States on reforming chemicals policies, the states are filling the holes in federal leadership. Vibrant debates about broad chemicals policy reform measures are taking place in at least eight states, and many other states and localities have initiated legislative or executive branch policies to restrict specific chemicals, to provide information on chemical hazards,

¹ Robert Glicksman, From Cooperative to Inoperative Federalism: The Perverse Mutation of Environmental Law and Policy, 41 Wake Forest L. Rev. 719 (2006).

to require “green” purchasing, or to support innovation in pollution prevention. Even though federal discussions on chemicals policy reform are beginning, the states are likely to continue to be the incubators of dialog and innovation for years to come.

In order to understand the emerging leadership of states in reforming the decades-old system of managing chemicals in commerce, the Lowell Center for Sustainable Production has undertaken an analysis of state chemicals policy efforts over the past twenty years. To accomplish this, the Lowell Center has:

1. Developed an online database of state and local legislative and executive branch chemicals policies from 1990 to the present, which provides detailed documentation on those policies; and
2. Conducted an analysis of state chemicals legislation and policies that have been enacted or proposed in order to better characterize and understand the range of chemicals policy efforts occurring at the state and local level. This analysis examines the evolution of chemicals policy, trends, drivers and barriers to reform, and opportunities for the future.

This report begins by defining “comprehensive chemicals policy,” which should be an ultimate goal of chemicals policy reform efforts. Findings from the database and analysis of state policies are then explored. The goal of the report is to provide important documentation and support to leaders across the country who are initiating dialog on sustainable chemicals policy reform.

METHODOLOGY

The analysis and online database were developed primarily through legislative database research, document review, and interviews with key stakeholders in the states, in addition to expertise developed by the Lowell Center over the past 15 years.

1. The data for the online database of state and local legislative and executive branch chemicals policies was collected from June 2007 to May 2009. More than 900 pieces of enacted and proposed state and local legislation and executive branch policies were gathered from document and report review and legislative database research. The database endeavors to capture chemicals policy legislation and executive branch policy from 1990 to the present. Given the wide range of chemicals policy efforts in the 50 states, it is likely additions and modifications to the database will need to be made over time. Any input and modifications to the database can be sent via a comment form attached to the database. A mechanism for updating the database monthly has also been established so it can be an evolving and important source of information for reform efforts. The database was launched in October 2008 and can be found at:
<http://www.chemicalspolicy.org/uslegislationsearch.php>

2. The analysis of chemicals policy trends at the state level is the result of document review, interviews, and more than 15 years of practical experience in working with states and other stakeholders in developing, implementing, and assessing chemicals policies. Over a three-month period in summer 2007, in person and telephone interviews were conducted with thirty-two key stakeholders from state government agencies, advocacy organizations and academia from seven states (California, Maine, Massachusetts, Michigan, New York, Oregon, and Washington). Key reports, analyses, websites, and other documentation were also analyzed.

DEFINING COMPREHENSIVE CHEMICALS POLICY

Comprehensive chemicals policy is a broad term that often is used interchangeably with terms such as toxic substances policy, chemicals management policy, and sustainable chemicals management policy. Ideally, comprehensive chemicals policies should be viewed in a holistic, integrated and prevention-oriented context—they should ensure protection of worker, community, and consumer health while stimulating the development and use of non-hazardous and sustainable chemicals in production systems, materials, and products.

Comprehensive chemicals policies should advance movement towards the Generational Goal outlined at the 2002 World Summit on Sustainable Development. The Generational Goal states that nations should “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...which says that threats posed by toxic chemicals should be eliminated within one generation.”

Six general features of comprehensive chemicals policies have been identified:

- **They take a comprehensive and integrated approach to all chemicals**, including toxic and hazardous substances as well as substances that are relatively benign. They go beyond “toxics policies” that focus on chemical-by-chemical or media-by-media restrictions. They also differ from traditional emissions policies which regulate the level of the chemical allowed in a workplace, air, or water.
- **They establish processes that allow rapid chemical assessment, prioritization, and decision-making** considering the inherent toxicity (hazards), uses, functions, and potential exposures through manufacturing, use, and disposal. Categories of chemicals typically are based on degree of concern, with substances of significant concern differentiated from substances of lesser concern, substances of unknown concern, and substances of little concern.

- **They are hazard rather than risk based.** The intrinsic hazards of chemicals are used to identify and prioritize chemicals of higher and lower concern (for example a chemical that is carcinogenic is always carcinogenic) and define actions that should be taken (for example avoiding persistent, bioaccumulative and toxic substances). Considerations of use and potential exposures are used to further prioritize chemicals and their uses for actions and are useful in understanding potential concerns and trade-offs from one substance to another.
- **They ensure adequate data collection and dissemination providing open access to information.** Information is critical to making informed judgments. There is a significant need for more research on the environment and human health effects of the chemicals commonly manufactured and used, especially, the thousands of substances used in small quantities. But, the generation of this data has no public value if it is not made transparent and openly available. The validity of science is only as good as the openness with which its results can be shared, reviewed, and evaluated.
- **They establish processes for transitioning chemical use from high hazard to low hazard substances.** Alternatives assessment or substitution planning processes are used to identify priority uses of substances of higher concern and opportunities for application of safer alternatives. These processes are used to drive and guide chemical substitutions in manufacturing and product design so that safer, feasible alternatives that do not create new hazards can be effectively implemented.
- **They promote research and innovation.** These initiatives are expected to push the development of safer and more environmentally compatible chemicals. As a consequence, these policies serve as drivers for better chemical data collection and more science to develop new, safer, and more effective chemicals – chemicals that need to be developed and synthesized through green chemistry principles.

These comprehensive chemicals policies may be government policies or corporate policies. The newly adopted Registration, Evaluation and Authorization of Chemicals (REACH) Regulation in the European Union is an important example of a comprehensive chemicals policy. However, there are also an increasing number of firms that are instituting across-the-board chemicals policies that cover all of the substances in their production processes, or alternatively, all of the substances used in an industrial facility from feedstocks to toilet cleaners. Examples include firms such as Nike, Herman Miller, True Textiles, Volvo, S.C. Johnson, Boots, and Dell.²

² Ken Geiser, Comprehensive Chemicals Policies for the Future, Lowell Center for Sustainable Production, University of Massachusetts Lowell (Jan. 2009).

Currently, chemicals policies can be found within:

- Regulatory and voluntary (legislative and executive branch) measures, such as those that: obtain information on the properties and uses of chemical substances; ensure information is transmitted to users of the chemicals; restrict certain chemicals or uses; or stimulate substitution of problem substances. These measures may be promulgated in legislation (laws) which have been approved by a legislature, or executive orders which are declarations established by governors usually intended to direct or instruct the actions of executive agencies or government officials. Although executive orders are not laws, they have the same binding effect. However, they may be rescinded by a subsequent administration.
- Company policies for determining what chemicals are used and how they are used.
- Fiscal policies, such as taxes on certain substances and financial responsibility measures.
- Educational and labeling initiatives.
- Research, development, and technical support for safer chemicals products.

This report focuses on state and local legislative and executive branch policies that pertain to the mandatory or voluntary regulation of industrial chemicals on their own or in consumer products through a variety of policy tools and mechanisms. *The focus is on industrial chemicals used in manufacturing processes and incorporated into products, not including pesticides and pharmaceuticals.* Pesticides and pharmaceuticals are not included because at the federal level in the U.S., pesticides and pharmaceuticals are regulated separately from industrial chemicals. Nanomaterials are also not included in this report. Although it is likely that much of nanomaterial policy will be situated within industrial chemicals policy, most states have not begun the process of regulating nanomaterials. Further, some product categories, such as cosmetics, toys, and other consumer articles, tend to be regulated under food and drug laws or consumer product safety laws. At the federal level, for example, cosmetics are regulated under the Federal Food, Drug and Cosmetics Act (implemented by the Food and Drug Administration) while toys tend to be regulated under the Consumer Product Safety Act (implemented by the Consumer Product Safety Commission). At the state level, some of these distinctions remain, though regulation of consumer products such as toys and cosmetics can occur under broader industrial chemicals policies, and as such, have been included in this report.

AN ANALYSIS OF THE DATABASE OF STATE AND LOCAL LEVEL LEGISLATIVE AND EXECUTIVE BRANCH CHEMICALS POLICIES

States serve as vital laboratories for shaping policy ideas and messages and for organizing strategies necessary for the eventual breakthrough to a comprehensive national chemicals policy. States (and localities) have undertaken a wide range of chemicals policy efforts over the past 20 years. The details of these enacted and proposed chemicals policies can be found in the online database at <http://www.chemicalspolicy.org/uslegislationsearch.php>.

For the purposes of this report (database and analysis), chemicals policy efforts have been divided into 13 categories, which were identified after the chemicals policy data were gathered. There are many enacted and proposed policies that contain multiple elements and therefore span more than one chemicals policy category. The 13 categories are: (1) pollution prevention and toxics use reduction; (2) single chemical restrictions; (3) multiple chemical policies; (4) regulation of product categories; (5) biomonitoring and environmental health tracking and surveillance systems; (6) data collection; (7) right-to-know; (8) prioritization; (9) alternatives assessment; (10) green chemistry and design for the environment; (11) product stewardship; (12) environmentally preferable purchasing; and (13) precautionary principle. See Appendix A for a brief description and examples of each policy category. A listing of findings from the database and the information that follows for these 13 categories can be found in Appendix B.

(1) Pollution Prevention and Toxics Use Reduction

Pollution prevention and toxics use reduction policies are multi-pollutant, multi-media strategies that shift the focus from end-of-pipe regulation to reduction of pollution at the source. These policies encourage changes in production processes, product, or raw materials to reduce, avoid, or eliminate the use of toxic or hazardous substances or the generation of hazardous byproducts.

Following the passage of the federal Pollution Prevention Act in 1990, many states enacted similar pollution prevention laws:

- Thirty-nine states have enacted or proposed some sort of pollution prevention legislation. Two counties and two cities also have enacted similar policies. Although the majority of states have set pollution prevention goals, there are a wide variety of programs and policies set up to achieve these goals at the state level. Some states simply have aspirational goals for pollution prevention, while others have voluntary pollution prevention programs that provide technical assistance to businesses. Only a small number of these policies and programs actively require, facilitate or encourage pollution prevention planning or mandatory material throughput data reporting. Only a few of these policies and programs integrate research and outreach on safer chemical alternatives to incorporate these substitutes into current industrial processes and products. Most of

these programs focus exclusively on reducing toxics in industrial process settings. However, some states are trying to extend these policies and programs to small businesses and households.

- Elements of pollution prevention and toxics use reduction are incorporated into other state policies, especially policies that focus on procurement and policies that focus on greening government management and operations.

(2) Single Chemical Restrictions

Single chemical restrictions are policies that ban or significantly restrict specific chemicals or uses of chemicals. This type of policy is the most prominent chemicals policy tool used at the state and local levels. A number of chemicals have been banned or restricted in some states and localities. The chemicals targeted by these policies include: lead, mercury, PBDEs, chromated copper arsenate, chlorinated solvents, dioxin, formaldehyde, perchloroethylene, phthalates, bisphenol A and diacetyl. Some examples include:

- **Mercury**—Thirty-two states, four counties, and twenty-one cities have enacted or proposed legislation that bans, significantly restricts, or discourages the use of mercury. This legislation ranges from the regulation of elemental mercury to bans of certain mercury-containing products (thermometers, thermostats, switches) to comprehensive mercury products policies, which provide for the management of mercury throughout all stages of the chemical's life cycle and includes a variety of policy mechanisms to achieve this goal (i.e. notification requirements, restrictions, phase-outs, labeling, collection, recycling, education, procurement preferences).
- **PBDEs**—Twelve states (California, Hawaii, Illinois, Maine, Maryland, Michigan, Minnesota, New York, Oregon, Rhode Island, Vermont, and Washington) have enacted and twelve states (Alaska, California, Connecticut, Hawaii, Illinois, Maryland, Michigan, Missouri, Minnesota, Montana, New York, and North Carolina) have proposed legislation restricting the use of PBDEs, chemicals used as flame retardants in an array of products, including building materials, electronics, furnishings, plastics, polyurethane foams, and textiles. Of the states that have enacted legislation, four (Maine, Oregon, Vermont, and Washington) restrict pentaBDE, octaBDE, and decaBDE, five (Illinois, Maryland, Minnesota, New York, and Rhode Island) restrict pentaBDE and octaBDE and require further study of decaBDE, and three (California, Hawaii, and Michigan) restrict pentaBDE and octaBDE. Of the states that have proposed legislation, five states (Alaska, Connecticut, Missouri, Montana, and North Carolina) have proposed bills restricting pentaBDE, octaBDE, and decaBDE, seven states (California, Hawaii, Illinois, Maryland, Michigan, Minnesota, and New York) have proposed bills to restrict decaBDE, and two states (Connecticut and Hawaii) have proposed bills restricting certain PBDEs.

- **Lead**—Fourteen states (California, Connecticut, Delaware, Illinois, Indiana, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, New Hampshire, Vermont, and Washington), one county (Vilas County, Wisconsin), and one city (Baltimore, Maryland) have enacted legislation prohibiting the use of lead in certain consumer products, including pipes, wheel weights, fishing tackle, tableware and housewares, cosmetics, children's and adult jewelry, children's products, children's toys, candy, lunch boxes and other novelty consumer products. Some of these policies also include labeling requirements for lead-containing consumer products. In addition, nineteen states (Alabama, California, Illinois, Indiana, Iowa, Kentucky, Maine, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Nebraska, New Jersey, New York, Pennsylvania, South Carolina, Tennessee, and Washington) have proposed this type of legislation or executive branch policy.
- **Chromated Copper Arsenate**—Four states (California, Maine, New York, and North Carolina) have enacted and two states (Minnesota and New Jersey) have proposed legislation prohibiting the use of chromated copper arsenate, a chemical commonly found in preservative-treated wood. This legislation ranges from restrictions on sales to a ban on the use of chromated copper arsenate treated wood in state and municipal building projects to a ban on the use in playground equipment to removal requirements to disposal regulations. One city (San Francisco, California) mandates the maintenance of playground equipment containing chromated copper arsenate, although this legislation does not ban or restrict the chemical. Two states (Michigan and New York) have proposed similar legislation.
- **Phthalates**—Three states (California, Vermont and Washington) and one city (San Francisco) have enacted and nineteen states (Alabama, Connecticut, Hawaii, Illinois, Indiana, Maine, Maryland, Massachusetts, Minnesota, Missouri, Mississippi, New Jersey, New Mexico, New York, Oregon, Pennsylvania, Rhode Island, South Carolina and West Virginia) have proposed legislation banning phthalates, chemicals commonly found in plastics. All of this legislation focuses on restricting the use of phthalates in children's toys and child care products. Much of this legislation also includes provisions that require the replacement of phthalates in these products with safer alternatives. Additionally, Hawaii has enacted legislation to further investigate the use of phthalates in children's products and Minneapolis, Minnesota has enacted legislation urging the state of Minnesota to phase out phthalates in children's products.
- **Bisphenol A**—Two states (Connecticut, Minnesota), one county (Suffolk County, New York) and two cities (Chicago, Illinois and San Francisco, California³) have enacted legislation banning bisphenol A, a chemical commonly found in plastics and children's products. Twenty-one states (California, Connecticut, Hawaii, Illinois, Maine, Maryland, Massachusetts, Michigan, Minnesota, Missouri, Mississippi, Montana, New Jersey, New

³ The legislation banning bisphenol A in San Francisco is being challenged in the courts.

Mexico, New York, Oregon, Pennsylvania, Rhode Island, Texas, Vermont, and Washington) and two counties (Schenectady County, New York and Albany County, New York) have proposed legislation restricting the use of bisphenol A in children's toys, child care products, and/or packaging. Much of this legislation also includes provisions that require the replacement of bisphenol A in these products with safer alternatives. One proposed bill in Texas requires the labeling of products containing bisphenol A. Additionally, Hawaii has enacted legislation to further investigate the use of bisphenol A in children's products, Pennsylvania has enacted a resolution urging Congress and the FDA to reduce the levels of bisphenol A in plastic food containers, plastic bottles, and the lining of cans, Chicago, Illinois has enacted a resolution urging the FDA to expedite its current review of the safety of bisphenol A and take appropriate action based on its findings, and Minneapolis, Minnesota has enacted legislation urging the state of Minnesota to phase out bisphenol A in children's products.

- **Dioxin**—Two states (Maine and New Hampshire), two counties (Marin County, California and San Francisco County, California), and three cities (Berkeley, California, Oakland, California, and Boston, Massachusetts) have enacted legislation regulating dioxin, a toxic waste byproduct that occurs when chlorinated waste is burned and when other organic chemicals that contain chlorine are manufactured. These policies include pollution prevention goals, the promotion of alternative products and processes, regulations on incineration, and public education. A number of environmentally preferable purchasing policies also contain provisions requiring the purchase of products that do not lead to the formation of dioxin.
- **Perchloroethylene**—One state (California) and two counties (Orange County, California and Los Angeles County, California) have enacted and four states (Massachusetts, New Jersey, New York, and Vermont) have proposed legislation regulating perchloroethylene. These policies include the phase out of perchloroethylene from dry cleaning processes, the regulation of perchloroethylene emissions from dry cleaning systems, the regulation of perchloroethylene dry cleaning facilities, the provision of technical assistance to dry cleaners and the assessment of safer alternatives to perchloroethylene and substitution where safer alternatives exist.
- **Formaldehyde**—One state (California) has enacted legislation regulating formaldehyde emissions from toxic wood products, using air regulations as a driver for chemicals policy. One state (Massachusetts) has declared formaldehyde a hazardous substance and has declared urea-formaldehyde foamed in-place insulation to be a banned hazardous substance. One state (New Hampshire) prohibits the manufacture or sale of urea-formaldehyde foam insulation and prohibits the sale of any particle board or fiber board containing urea-formaldehyde resin without a written cautionary statement to the purchaser.

(3) Multiple Chemical Policies

Multiple chemical policies regulate groups or classes of chemicals, rather than just one chemical.

- A number of policies have been enacted at the state and local levels to regulate persistent, bioaccumulative and toxic chemicals (PBTs). Two states (Maine and Oregon) have executive orders that advance a commitment to phase out PBTs. One state (Washington) has passed an executive order and enacted legislation that requires the development of chemical action plans for PBTs. One state (Oregon) has enacted legislation to prioritize and study persistent pollutants discharged in the state. One state (Alaska) has proposed legislation to develop a list of PBTs. One county (Erie County, New York) and four cities (Buffalo, New York, Bellingham, Washington, Olympia, Washington, and Seattle, Washington) have passed resolutions to encourage the reduction of pollution from PBTs, encourage the purchase of products that do not contain PBTs, and stimulate the development of alternatives to PBTs.

Legislation that focuses on priority toxic substances has also been enacted and proposed at the state level.

- One state (California) has enacted legislation to create a process for identifying and prioritizing chemicals of concern. Five states (California, Connecticut, Massachusetts, New York, and Vermont) have proposed legislation that focuses on identifying and prioritizing toxic substances. In addition, four states (Connecticut, Maine, Minnesota, and Washington) have enacted and nine states (Alabama, Illinois, Indiana, Michigan, Oregon, Pennsylvania, Rhode Island, South Carolina, and Wisconsin) have proposed legislation that seeks to identify and regulate priority chemicals in children's products.

Other legislation that seeks to regulate groups or classes of chemicals that has been enacted or proposed includes: high production volume chemicals (proposed in California); xenoestrogens (i.e. chemicals with estrogenic effects) (proposed in Pennsylvania); toxic substances in children's products (proposed in Michigan); carcinogens, teratogens, hormone disruptors, reproductive toxicants and developmental toxicants in children's products (proposed in Texas); and hazardous substances (enacted in California, Colorado, Connecticut, Illinois, Indiana, Maryland, Massachusetts, Michigan, Montana, Oregon, Ohio, New Hampshire, North Dakota, South Carolina, Tennessee, Texas, and Wisconsin).

(4) Regulation of Product Categories

Instead of regulating single chemicals or groups of chemicals, some states and localities are beginning to regulate and propose legislation that would regulate categories of products. These types of policies include regulating chemical use in products, encouraging the use of less toxic products, and labeling/disclosing chemicals in products.

To date, states and localities have enacted or proposed legislation for a number of product categories.

- **Packaging**—Nineteen states have enacted toxics in packaging laws that prohibit the sale or distribution of packaging containing intentionally added cadmium, lead, mercury, and hexavalent chromium, and set limits on the incidental concentration of these materials in packaging. Ten states have proposed legislation that restricts the use of bisphenol A in packaging.
- **Cleaning Products**—Three states (Connecticut, New Jersey, and New York) have executive orders that require state agencies to purchase and use environmentally preferable cleaning products. One state (Wisconsin) has an executive order requiring the establishment of sustainable building operation guidelines for state facilities, including green cleaning. One state has enacted (Delaware) and three states (Florida, Illinois, and Washington) have proposed legislation that requires state agencies to purchase and use environmentally preferable cleaning products. Two counties (Nassau County, New York and Multnomah County, Oregon) have enacted policies that require county facilities to purchase and use environmentally preferable cleaning products. Four cities (Chicago, Illinois, Boston, Massachusetts, Minneapolis, Minnesota, and New York City, New York) have enacted policies that require city facilities to purchase and use environmentally preferable cleaning products. Four states (Illinois, Maine, Missouri, and New York) have enacted and twelve states (California, Connecticut, Hawaii, Iowa, Maryland, Minnesota, Mississippi, Nevada, Oregon, Virginia, Vermont, and Rhode Island) have proposed legislation that requires schools to purchase and use environmentally preferable cleaning products. One state (New Jersey) has proposed legislation that would regulate the purchase and use of cleaning products in hospitals, one state (Massachusetts) has proposed legislation that would regulate the purchase and use of cleaning products in schools, hospitals, healthcare facilities, daycare centers, public buildings and public housing, and one state (California) has proposed legislation that would require the evaluation of cleaning products used to clean supermarkets.
- **Children's Products and Toys**—Ten states (California, Connecticut, Delaware, Hawaii, Illinois, Maine, Maryland, Minnesota, Vermont, and Washington), two counties (Suffolk County, New York and Albany County, New York) and two cities (San Francisco, California and Minneapolis, Minnesota) have enacted legislation that regulates children's products or toys. Thirty-one states and one county have proposed legislation that would regulate children's products or toys. Much of this legislation restricts the use of phthalates, bisphenol A, lead, and/or priority chemicals of concern in these product categories.
- **Cosmetics and Personal Care Products**—Three states (California, Oregon, and Washington) have enacted and ten states (California, Connecticut, Illinois, Maryland,

Minnesota, New Jersey, New York, North Dakota, Oregon, and Washington) have proposed legislation that regulates cosmetics and personal care products. Some of these policies require the identification of and labeling of chemicals in products, the investigation of cosmetic products containing chemicals identified as causing cancer or reproductive toxicity or other ingredients of concern, and the prohibition of the manufacture and sale of cosmetic products containing certain chemicals, such as carcinogens, phthalates, lead, and mercury. Other legislation simply urges Congress to enact legislation requiring testing, review and approval of ingredients in cosmetics and personal care products.

(5) Biomonitoring and Environmental Health Tracking and Surveillance Systems

Biomonitoring policies support the assessment of human biologic specimens (blood, urine, breast milk, fat tissue) to characterize the levels of human chemical exposure. Policies establishing environmental health tracking and surveillance systems require tracking and monitoring of the links between exposures to chemicals and environmental hazards and adverse human health effects.

The establishment of biomonitoring programs and environmental health tracking systems is increasingly seen as a way to understand the general population's exposure to chemicals as well as a powerful advocacy tool for substitution of chemicals of concern. Since the exposure and disease profiles vary geographically, state and local biomonitoring programs are needed to collect this type of information. Three states (California, Illinois, and Minnesota) have enacted biomonitoring legislation and three states (Indiana, Tennessee, and Washington) have proposed biomonitoring legislation. One state (New York) has proposed legislation that would establish an environmental health tracking system. Additionally, several states have received funding from the Centers for Disease Control to conduct state-wide biomonitoring efforts.

(6) Data Collection

Data collection policies encourage the gathering and dissemination of information about the presence, toxicity, and/or use of chemicals in products and processes. These types of policies may require further research and testing of specific chemicals to assess potential health and environmental impacts, the establishment of monitoring programs to detect the presence of contaminants in the environment, or the manufacturer's or distributor's submission of chemical production and use information. Nine states (Connecticut, Louisiana, Maine, Massachusetts, New Hampshire, New York, North Carolina, Rhode Island, and Vermont) have enacted mercury products legislation that includes provisions requiring notification for mercury-added products. Seven states (California, Hawaii, Illinois, Maine, Minnesota, Oregon, and Washington) and one city (Berkeley, California) have enacted legislation containing these data collection mechanisms. Seventeen states (Alabama, California, Hawaii, Illinois, Indiana, Massachusetts, Michigan, Minnesota, New York, North Dakota, Oregon, Pennsylvania, South Carolina, Vermont, Virginia,

Washington, and Wisconsin) have proposed legislation containing these data collection mechanisms.

(7) Right-to-Know

Right-to-know laws provide information about possible chemical exposures. They require or encourage the provision of information or disclosures about exposures and health risks associated with chemicals to workers and the general public. Many states implemented worker right-to-know statutes about chemicals used in the workplace in the 1980s, leading subsequently to the OSHA Hazard Communication Standard. The most widely known piece of federal right-to-know legislation, the Emergency Planning and Community Right-to-Know Act was enacted in 1986 to provide information on chemical releases from manufacturing facilities. Additionally, the Environmental Protection Agency has several other right-to-know type programs regarding air pollution, drinking water quality, and permit violations, to name a few. Various right-to-know policies at the state and local level build on existing federal legislation. Generally, these policies require users of hazardous substances to publicly report those uses. Other state right-to-know legislation focuses on the labeling of consumer products to inform the general public of the chemical content of these products.

One state (California) has enacted two pieces of legislation and passed a referendum that achieve broad right-to-know goals. The enacted legislation creates a toxics information clearinghouse and expands on the federal toxics release inventory program. The referendum, Proposition 65, establishes extensive labeling requirements for products containing carcinogens or reproductive toxicants that can be enforced through citizen law suits. One city (Eugene, Oregon) has enacted legislation that requires information on toxics, precautions, and alternatives to be available. Two states (Connecticut and New Jersey) have enacted legislation that requires disclosures about chemicals in occupational settings.

Many other states have enacted legislation that includes right-to-know elements, such as labeling, warnings, and education programs.

- Ten states (Connecticut, Louisiana, Maine, Massachusetts, Minnesota, New Hampshire, New York, Rhode Island, Vermont, and Washington) have enacted and four states (Alabama, Michigan, Mississippi, and New York) have proposed legislation that includes labeling requirements for mercury-added products. Two states (Connecticut and Vermont) have enacted and three states (Minnesota, South Carolina, and Washington) have proposed legislation that includes labeling requirements for products containing lead. Three states (California, Connecticut, and Minnesota), one county (Dane County, Wisconsin), and two cities (Minneapolis, Minnesota and Madison, Wisconsin) have enacted and one state (Vermont) has proposed legislation that includes labeling requirements for lighting containing mercury. One city (Chicago, Illinois) has enacted and two states (New Jersey and Texas) have proposed legislation requiring labeling of

products containing bisphenol A. One state (New Jersey) has proposed legislation requiring labeling of packaging containing phthalates. One state (California) has enacted and one state (Michigan) has proposed legislation that requires labeling of wood treated with chromated copper arsenate. Seventeen states (California, Colorado, Connecticut, Illinois, Indiana, Maryland, Massachusetts, Michigan, Montana, Oregon, Ohio, New Hampshire, North Dakota, South Carolina, Tennessee, Texas, and Wisconsin) have enacted legislation that requires labeling of products containing banned hazardous substances. One state (Massachusetts) has proposed legislation that requires labeling of cleaning products. One state (New Jersey) has proposed legislation requiring labeling of children's products. Two states (Oregon and Tennessee) have enacted legislation requiring labeling of toxic substances in art supplies. One state (Oregon) has enacted legislation urging the federal government to label all ingredients in cosmetics and personal care products and three states (Minnesota, New Jersey, and New York) have proposed legislation requiring labeling of cosmetics.

- One city (San Francisco, California) has enacted legislation that establishes a dioxin education program. One state (Montana) has enacted and three states (California, Nebraska, and New York) have proposed legislation that requires consumer education about electronics recycling alternatives. One state (Oregon) has enacted and one state (New York) has proposed legislation that establishes a mercury education program. Three states (Illinois, Minnesota, and New York) have proposed legislation that establishes a lead education program. One state (Washington) has enacted and five states (Alabama, Illinois, Indiana, Pennsylvania, and South Carolina) have proposed legislation that requires consumer education regarding chemicals in consumer products.

(8) Prioritization

Prioritization policies establish a framework for assessing and prioritizing chemicals. Although prioritization of chemicals is widely seen as a necessary step for chemicals policy, states are just beginning to develop and implement frameworks to achieve this goal. Six states (California, Connecticut, Maine, Minnesota, Oregon, and Washington) have enacted legislation that establishes a framework for assessing and prioritizing chemicals. Fourteen states (Alabama, Connecticut, Indiana, Illinois, Massachusetts, Michigan, Minnesota, New York, Oregon, Pennsylvania, Rhode Island, South Carolina, Vermont, and Wisconsin) have proposed legislation that establishes a framework for assessing and prioritizing chemicals.

(9) Alternatives Assessment

Alternatives assessment policies encourage research to support or establish requirements to replace the use of toxic chemicals with the use of alternatives that have been carefully and methodically evaluated for safety.

One state (California) has enacted legislation that mandates the creation of methods for analyzing alternatives to existing hazardous chemicals. One state (Connecticut) has proposed legislation to establish a research institution to conduct alternatives assessment and encourage the substitution of toxic chemicals with safer alternatives. One state (Washington) has proposed legislation that requires the development of a safer chemical alternatives research and development program. One state (Massachusetts) has incorporated alternatives assessment as a key element of its Toxic Use Reduction program and proposed legislation to require alternatives assessments for high concern chemicals.

In addition, three states (Connecticut, Maine, and Minnesota) have enacted and eight states (Illinois, Massachusetts, Michigan, Minnesota, Oregon, Rhode Island, Vermont, and Wisconsin) have proposed legislation that would enhance current alternative assessment efforts through the establishment of a framework for prioritizing chemicals, identifying safer alternatives, and encouraging substitution where safer alternatives exist. Further, other types of policies enacted at the state and local level are also encouraging alternatives assessment. For example, many pieces of enacted and proposed legislation that bans or restricts single chemicals also contain provisions that require the assessment of alternative chemicals to choose an appropriate substitute for the banned or restricted chemical. Such provisions can be found in legislation that bans or restricts: perchloroethylene (two states, two counties); phthalates and bisphenol A (twelve states); polybrominated diphenyl ethers (ten states); chlorinated solvents (one state); and chromated copper arsenate (one state, one city).

(10) Green Chemistry and Design for the Environment

Green chemistry and design for the environment policies encourage the redesign of chemicals, products, and processes from the outset to reduce or eliminate the use and generation of hazardous substances. Green chemistry is defined by 12 principles of chemical design. However, some states have used the term green chemistry more broadly to refer to chemicals reform policies that encourage the implementation of safer chemistries.

One state (Michigan) has issued an executive directive that encourages the research, development and the implementation of innovative chemical technologies that accomplish pollution prevention, promotes the use of chemical technologies that reduce or eliminate the use or generation of hazardous substances during the design, manufacture and use of chemical products, and encourages the use of safer chemical alternatives. Michigan has also proposed legislation that would provide tax and financial incentives for green chemistry research. One state (California) has an active a Green Chemistry Initiative, which provides a framework to coordinate state activities on chemicals policy reform and the design and implementation of safer chemicals and products. In December 2008, the initiative, supported by a Science Advisory Panel published a report and recommendations for developing approaches for evaluating risk, reducing exposure, encouraging less-toxic industrial processes, and identifying safer, non-chemical alternatives. One state (Minnesota) has enacted legislation that requires a report with recommendations on incentives for

product design that uses green chemistry and has proposed legislation that requires the development of a comprehensive framework for promoting chemistry and chemical engineering approaches that reduce or eliminate risks to health or the environment in the design of products. Another state (Oregon) is initiating an executive level Green Chemistry program. Several states have undertaken voluntary initiatives around Clean Technologies (or Clean Tech) that focus on green jobs development, tax and financial incentives for clean tech investments, and economic research. While these programs have focused primarily on the clean energy sector, in several states (for example New York, Massachusetts, Michigan and Oregon) there is increased interest in economic development linked to green chemistry, green biofuels, and safe nanotechnology.

(11) Product Stewardship

Product stewardship policies can be thought of as chemicals policies or product policies. They establish an environmental management strategy for minimizing a product's environmental impact throughout all stages of a product's life cycle, particularly at the end of life. Managing a product from cradle to grave has become an increasing concern at the state and local levels, especially as local governments deal with waste generation and chemical restrictions linked to hazardous waste collection programs.

Five states (California, Minnesota, Oregon, Rhode Island, and Washington) have proposed framework product stewardship legislation, which establishes extended producer responsibility as policy and gives state government agencies the authority, through regulation, to address multiple products over time. However, most of the enacted and proposed legislation to date on product stewardship has focused on electronics waste and mercury-added products. Thirty-eight states and three cities have enacted or proposed legislation providing for the management of obsolete electronics, since many of these products contain toxic components. These policies utilize a number of different product stewardship schemes; however, many of the policies focus on producer responsibility for managing products throughout their life cycle. In addition, enacted and proposed legislation in thirty-two states, two counties, and seven cities includes collection and recycling provisions for products containing mercury. Further, legislation enacted in one city and proposed in one state provides for the end-of-life management of wood that contains chromated copper arsenate.

(12) Environmentally Preferable Purchasing

Environmentally preferable purchasing policies can also be thought of as chemicals policies or product policies. They require or encourage the purchase of products based on particular environmentally sensitive attributes (i.e. less toxic chemicals, recycled material content, energy efficiency, etc).

There are many environmentally preferable purchasing policies at the state, and especially local level. Eighteen states, fifteen counties, and twenty-five cities have enacted and two states and one

city have proposed environmentally preferable purchasing policies. Most of these policies at the state level are executive branch initiatives, although there are also a number of legislative initiatives. Overall, these initiatives require or encourage more environmentally preferable state and local government purchasing decisions for a wide range of products. Some of these policies are more aspirational, while others lay out a transparent decision-making process for choosing the least toxic products based on chemical attributes and other environmental impacts. In addition, this policy tool is incorporated into other policies, including those that restrict the use of certain cleaning products and those that ban the use of decaBDE.

(13) Precautionary Principle

Precautionary principle policies define and develop approaches for applying the precautionary principle in practice to reduce the impacts caused by toxic chemicals and other environmentally damaging products and activities (such as energy use). These policies encourage the state or locality to take precautionary measures to protect public health and the environment where threats of harm to human health or the environment exist, even if there is a lack of full scientific certainty about cause and effect. These policies also require decision-makers to incorporate the precautionary principle into the decision-making process.

One state (Hawaii) has enacted a senate resolution that incorporates the precautionary principle into the decision-making process of state departments and agencies. One state (New York) has proposed legislation that would establish a precautionary policy for the state as well as precautionary criteria and a precautionary policy planning council. One state (Washington) has proposed legislation that incorporates the precautionary principle and human health analysis into environmental review. In addition, two counties (Marin County, California and Multnomah County, Oregon) and four cities (San Francisco, California, Berkeley, California, Portland, Oregon, and Seattle, Washington) have enacted and one city (Ann Arbor, Michigan) has proposed precautionary principle resolutions, which incorporate the principle into local decision-making processes.

AN ANALYSIS OF THE LESSONS LEARNED FROM STATE AND LOCAL LEVEL CHEMICALS POLICY EFFORTS

This section builds on the previous section's overview of the scope and content of state level chemicals policies and explores several important lessons in the development of state level chemicals policy over the past 20 years. The analysis is based on document review, interviews with state level experts, and more than 15 years of practical experience in working with states and other stakeholders in developing, implementing, and assessing chemicals policies.

States have experimented with a range of approaches for regulating industrial chemicals in industrial processes and products. More specifically, this section explores: (1) the evolution of chemicals policy at the state level; (2) current trends in state chemicals policies, including current

approaches and future directions; (3) drivers for state level chemicals policy reform, both long-term trends and new drivers; (4) barriers to reform; and (5) opportunities for the future.

(1) The Evolution of Chemicals Policy at the State Level

The types of policies being developed to regulate chemicals at the state and local level have evolved over time. Overall, the evolution of chemicals regulation at the state and local level can best be described by two key trends: (1) a shift from “toxics” policy to “chemicals” policy and (2) a shift from a phase-out approach to a phase-in approach.

It is important to note that these trends are accompanied by a general shift in concerns about toxic chemicals that has occurred over time. Thirty years ago concerns about chemicals focused on releases into the environment from industrial facilities. Today, concerns about chemicals are focused on small amounts of toxic chemicals released from a wide range of products ubiquitously distributed about our homes and workplaces, rather than large volumes of hazardous chemicals generated by a few large industries. While the entrance of chemicals from industrial processes into the environment is still of concern, the disperse exposures to chemicals in products pose additional challenges. This shift has profound implications for chemical assessment and management. Many of the current gaps in understanding chemicals and safer alternatives relate to this process-product shift.

- **A shift from toxics policy to chemicals policy.** Toxics policy is best characterized by the management of chemicals, as is currently practiced. This results in the use of a variety of policy tools to control and manage the "chemical du jour," including studying and monitoring individual chemicals, "end-of-pipe" management of hazards, and chemical bans. Even when these policies are successful, they only deal with a small number of chemicals at most and do not establish a comprehensive approach to chemicals regulation. Comprehensive chemicals policy, on the other hand, focuses on understanding the inherent toxicity of chemicals, prioritizing those chemicals of greatest concern, and taking preventive actions on a broad range of substances. This results in the use of a variety of policy tools to gather data on existing chemicals, to identify and develop safer alternatives to toxic chemicals, and to redesign chemicals from the outset. Thus, this approach leads to the development of the foundation necessary for the comprehensive management of chemicals.

The regulation of chemicals at the state and local level began in the 1980s when states and localities increasingly realized that existing federal regulations did not provide sufficient information on chemical hazards, were primarily based on expensive media-specific end-of-pipe technologies, and did not sufficiently address the problems posed by chemicals to humans and the environment. The first wave of state action on chemicals during the 1980s and early 1990s took the form of right to know, information on chemical emissions and storage, and hazardous waste management/reduction strategies. These

policies focused primarily on workplace chemical exposures, chemical accident notification, and hazardous waste generation in industrial facilities.⁴

Eventually, these programs led to the development of pollution prevention programs that aimed to reduce waste, emissions, and hazardous chemical use at its source. Specifically, pollution prevention programs began to establish goals for pollution reduction and offered technical assistance to industry in order to encourage and facilitate changes in production processes, products themselves, or the raw materials used in order to reduce, avoid, or eliminate the use of hazardous substances or the creation of hazardous byproducts. Some states required mandatory planning for manufacturing firms to examine options for reducing toxic chemical use and waste.

Over time, the focus shifted from the reduction of toxics in industrial processes to the reduction of toxics in products. States and localities began to embrace a chemical-by-chemical approach to toxics regulation, with single chemical bans or bans on classes of chemicals becoming the policy tool of choice. Some of these ban policies sought to restrict the use of certain chemicals without consideration of the alternative chemicals to be substituted. However, more recently states have begun to recognize the need for integrating the identification of safer alternatives into these policies.

Currently, some states and localities are beginning to move away from a chemical-by-chemical approach to toxics management as they increasingly recognize that a more comprehensive approach is necessary to adequately address the problems posed by chemicals and potential shifting of risks from one problem chemical to another. States have begun to realize the importance and necessity of a better understanding of the inherent toxicity of chemicals and the harm they pose to humans and the environment. This understanding is the foundation of a comprehensive chemicals policy. It can be buttressed and advanced by a number of policy tools including alternatives assessment, biomonitoring, green chemistry, data collection, and other information-forcing regulations.

- **A shift from a phase-out approach to a phase-in approach.** Many current and previous approaches to chemicals illustrate the focus on eliminating or controlling chemicals that pose known or scientifically established hazards to human health and the environment. These approaches often do not consider the design of chemicals themselves and the inevitable use of chemicals in industry and consumer products. They often are reactive to problems of the day and fail to consider whether the alternatives are indeed safer and more sustainable. A new “phase-in” approach that focuses on identifying and stimulating the development of non-toxic or low-toxic chemicals that can be used safely in processes and products is now emerging. The identification and

⁴ Ken Geiser and Joel Tickner, “Reforming State-Level Chemicals Management Policies in the United States: Status, Opportunities, and Challenges,” *in Options for State Chemicals Policy Reform: A Resource Guide*, Lowell Center for Sustainable Production, University of Massachusetts Lowell (Jan. 2008).

development of safer alternatives is the hallmark of this phase-in or substitution process. The availability of feasible, safer alternatives is a critical element for decision-makers and the public in efforts to take restrictive actions on chemicals of concern. Although this trend is still limited and has little statutory authority as yet, alternatives assessment and green chemistry policies are increasingly being discussed at the state level.

(2) Current Trends in State Chemicals Policies

States are serving as laboratories for experimentation, as evidenced by the myriad policy efforts currently being pursued by states and localities. As discussed previously, there are 13 different categories of policies that have been enacted or proposed at the state and local level, ranging from pollution prevention initiatives to environmentally preferable purchasing to multiple chemical restrictions and right to know.

In addition to this wide range of efforts, there are a number of key policy areas of interest identified both as policy areas that are currently being pursued as well as policy areas that are currently being considered and likely to be pursued in the future. Key policy areas include:

- **Bans of single chemicals or uses of chemicals.** One key policy area that will continue to be of interest is chemical bans of single chemicals or uses of chemicals in consumer products (e.g. flame retardants, phthalates, bisphenol A, mercury, and lead). These types of policies have a long history at the state and local levels and have achieved some success. Despite the frustration expressed by many with a chemical-by-chemical approach to chemicals policy, single chemical bans remain a key policy area of interest at the state level since both advocates and policymakers are familiar with this approach and have seen these types of policies succeed. These policies highlight the problems of chemicals in consumer products and raise awareness of the need for more comprehensive policy solutions.

Nonetheless, recognizing the limits and costs associated with chemical-by-chemical policies, at least twelve states, fueled by strong advocacy coalitions and interstate collaboration, have passed or are initiating more comprehensive chemicals policy reform policies that would include chemical prioritization, restrictions on chemicals of concern, and support for safer alternatives.

- **Environmentally preferable purchasing.** A second key area of interest at the state and local levels is environmentally preferable purchasing and other market-based approaches to encourage the use of safer products. Many states and localities have enacted or proposed environmentally preferable purchasing policies that require or encourage more environmentally preferable state and local government purchasing decisions for a wide range of products. States are increasingly relying on third-party certifications in purchasing, such as GreenSeal or EPA's Design for Environment logo as a means of

demonstrating the choice of the greenest product for a particular use. There is interest in expanding these efforts to provide purchasing recommendations to consumers at large. Some see environmentally preferable purchasing not necessarily as a policy tool, but simply as a means to increase awareness of the general population about the health and safety concerns of everyday products.

- **Identifying safer alternatives to toxic chemicals.** A third key area of interest is identifying safer alternatives to toxic chemicals and requiring substitution where feasible alternatives exist. There is significant interest in pursuing policies that would focus on assessment and implementation of safer alternatives to dangerous chemicals, but many states have noted limited resources and expertise as barriers to passing and implementing such policies. Such policies, with alternatives assessments conducted by government agencies or business, build off of the concept of traditional pollution prevention planning processes.
- **Green Chemistry.** A fourth key policy area of interest is green chemistry, which is viewed as critical to the supply of safer chemicals and products. Green chemistry is defined as the utilization of a set of 12 principles that reduce or eliminate the use or generation of hazardous substances in the design, manufacture, and application of chemical products.⁵ Some states, such as California, have defined green chemistry more broadly to include both traditional chemicals policy elements, such as data collection and restrictions of chemicals, as well as research and development of new chemistries. In all cases, green chemistry is seen as a tool to spur innovation and economic development, as an opportunity for businesses to become competitive, and an approach to finding suitable alternatives to problem chemicals. Currently, state experimentation with green chemistry initiatives is in its infancy, but two states – Michigan and California – are implementing action plans for green chemistry application. At least two other states – Oregon and Minnesota – are discussing green chemistry initiatives. The California initiative focuses more broadly on chemicals policy reform while the initiative in Michigan is primarily focused on economic development.

(3) Drivers for State Level Chemicals Policy Reform

Several important factors are coming together to stimulate a broad range of actions on chemicals policy reform at the state and local level. Some of these factors are longer term trends that have laid the foundation for chemical policy initiatives and some are new drivers. Together, they have created a window of intense activities on state chemicals policy reform that has not been seen since the late 1980s and early 1990s when right-to-know and pollution prevention laws were being contemplated. The longer term trends include:

⁵ Paul Anastas and John Warner, Green Chemistry Theory and Practice (1998).

- **Limited federal oversight of chemicals in products and a significant lack of leadership in modernizing the Toxic Substances Control Act (TSCA).** TSCA, now 30 years old, is the primary federal law regulating industrial chemical manufacture and use and is the only law that is intended to enable regulation of chemicals both before and after they enter commerce. TSCA established programs for addressing existing chemicals on the market prior to 1980 and new chemicals entering the market since then. However, TSCA has not served as an effective vehicle for the public, industry, or government to assess the hazards of chemicals in commerce, to control those that are known to be hazardous to public and environmental health, or to stimulate government and industry investment in the research and development of safer chemicals.^{6 7 8 9} Other laws that address chemicals in consumer products, such as the Consumer Product Safety Act and the Federal Food Drug and Cosmetics Act have been equally limited.¹⁰ Current state activities are in part direct responses to limited data and federal action on chemicals in commerce—in production and everyday products.
- **New science.** New science, such as science linking chemicals to adverse health effects particularly from everyday products, is providing justification for state and local governments to act. This new science has broadened understanding that the public is not exposed to single chemicals, but rather a mixture of chemicals that can only be addressed through comprehensive prevention-based approaches. The development and application of research techniques that enable scientists to monitor chemicals in human bodies and the environment have been important drivers of chemicals policy. The publication of this data in the mainstream media has significantly increased public awareness about chemicals in everyday products and as a result consumer pressure for changing policy.
- **The costs of not taking action.** The high cost to states and localities of not taking action has motivated the pursuit of chemicals policy reform. For example, the failure of the federal government to reduce or prevent the use of toxic chemicals is costly for local governments, which are responsible for the end-of-life treatment and management of toxic products. The failure to reform chemicals policy could lead to increased health care costs in the state and impacts are likely to be local in nature.¹¹ Advocates in several states have worked with economists to calculate these health costs attributable to toxic chemical exposures, which can be billions of dollars per year.¹² The environmental costs of

⁶ Geiser and Tickner, *supra* note 4.

⁷ Michael P. Wilson, Daniel A. Chia, and Bryan C. Ehlers, Green Chemistry in California: A Framework for Leadership in Chemicals Policy and Innovation, 16 *New Solutions* 365 (2006).

⁸ Richard Denison, Not That Innocent: A Comparative Analysis of Canadian, European, and U.S. Policies on Industrial Chemicals, Environmental Defense (Apr. 2007).

⁹ Government Accountability Office, Chemicals Regulation: Comparison of U.S. and Recently Enacted European Approaches to Protect Against the Risk of Toxic Chemicals, GAO-07-825 (2007).

¹⁰ Joel Tickner and Yve Torrie, Presumption of Safety: Limits of Federal Policies on Toxic Substances in Consumer Products, Lowell Center for Sustainable Production, University of Massachusetts Lowell (Feb. 2008).

¹¹ Lisa Heinzerling and Frank Ackerman, Pricing the Priceless: Cost-Benefit Analysis of Environmental Protection, Georgetown Environmental Law and Policy Institute, Georgetown University Law Center (2002).

¹² Kate Davies, Economic Costs of Diseases and Disabilities Attributable to Environmental Contaminants in Washington State, Collaborative for Health and Environment (Jul. 2005).

chemical contamination are often obvious, as is the case with the ongoing efforts to clean up Puget Sound in Washington.¹³

- **Other.** A number of other factors are driving, as well as facilitating, the development and enactment of new chemicals policies at the state and local level. The presence of broad-based support from a variety of stakeholder groups and relationships/partnerships between advocates, industry, and government are a driving force. Specifically, the power of environmental and public health organizations to convene diverse coalitions focused on substituting chemicals of concern with safer alternatives has had an important impact on state policy agendas. The existence of model legislation, for example, model mercury products legislation, has served to spur action at the state and local level and as a means of facilitating the enactment of policies.¹⁴ Similarly, the actions and progress of other states has served as a driving force for action in states contemplating chemicals policy reform. Finally, the availability of safer alternatives has served as an important driver for substitution. As state policies focus increasingly on alternatives and substitution, a critical barrier to change – the perceived lack of alternatives for particular uses of problem chemicals – is overcome. The focus on alternatives not only stimulates innovation but also helps to minimize the possibility that a chemical that poses a different set of hazards takes the place of one of concern.

The new drivers include:

- **Increasing public attention to chemicals in consumer products.** Scientific knowledge about the buildup of chemicals in the environment and the potential health effects of exposures is increasing significantly. The increasing media and consumer attention to issues such as flame retardants, phthalates, lead, mercury and bisphenol A has raised awareness and concerns about toxic substances in consumer products and their ability to get into air, water, house dust, and the human body. The failure of the federal government to take action on chemicals and to protect human health coupled with advocacy campaigning in the states has increased pressure on state and local governments to take the lead on these issues and thus, has been an important force behind their action.

Advocates have been increasingly successful in framing chemicals problems in ways that capture the attention of decision-makers and the public at large. The focus on chemicals building up in people's homes, cord blood, and dangers of everyday products, coupled with the concern about children's health spurred by a growing consumer awareness and action following the record number of toy recalls, has led to the ability of several states to propose or pass legislation, such as bills enacted in Maine, Washington, and Connecticut

¹³ Puget Sound Partnership, Puget Sound Action Agenda, http://www.psp.wa.gov/aa_action_agenda.php.

¹⁴ Northeast Waste Management Officials' Association (NEWMOA), Mercury Education & Reduction Model Act, <http://www.newmoa.org/prevention/mercury/modelleg.cfm>.

that focus on children's health.

Additionally, a focus on environmental justice and the unequal burdens some populations (minority, low-income, workers) face with regards to chemically related impacts has been important in mobilizing support for chemicals policy reforms in some locations.

- **Business actions to develop safer chemicals and products.** As a result of concerns about the health effects of chemicals, customer concerns, or catastrophes involving their products, many leading companies are beginning to exert their own market influence to demand safer chemicals in their supply chains. In some cases, large retailers, such as Wal-Mart, H&M, Boots, and Marks and Spencer, have instituted chemicals policies, including restricted substances lists, with which their suppliers must comply. Many leading manufacturers ("downstream users of chemicals") are developing processes to prioritize chemicals of concern and assess safer alternatives. The benefits in avoiding problem chemicals as well as investing in the implementation of safer alternatives are becoming apparent. Such actions of large firms have the potential to create large-scale market changes in the absence of concrete regulations.¹⁵
- **European and other chemicals policy reforms.** In recent years, the European Commission has established two extensive chemicals policy reforms: the Directive on Waste from Electrical and Electronic Products (WEEE) and its sister Directive, Restrictions on Hazardous Substances (RoHS); and the sweeping Registration, Evaluation, and Authorization of Chemicals (REACH) regulation. Both have important global implications—particularly in the United States for manufacturers wishing to export to Europe. These manufacturers will need to comply with the European policies in order to maintain their markets overseas and any impacts of non-compliance will be at the state and local levels. Since the economic impacts of failing to respond proactively to these initiatives will be felt at the state level, several states have initiated industry dialogs to comply with and go beyond European regulations. Efforts in Canada to rapidly prioritize and possibly act on chemicals of high concern have also spurred the pursuit of similar standards and policy reforms at the state and local level.¹⁶

(4) Barriers to Reform

Despite the many innovative policy developments currently occurring at the state level, there are also a number of important barriers to chemicals policy reforms that range from access to information, to technical and financial resources, to modifying ingrained approaches to chemicals management based on time and resource-consuming chemical-by-chemical risk assessments. These hurdles have hindered the efforts in many states to implement broad chemicals policy reforms, instead relying on piecemeal chemical restrictions and other efforts. Policy-makers and

¹⁵ Green Chemistry and Commerce Council, <http://www.greenchemistryandcommerce.org/home.php>.

¹⁶ Geiser and Tickner, *supra* note 4.

other stakeholders must be cognizant of these challenges because a poorly implemented policy with limited results will create skepticism towards government's ability to manage chemicals and hinder future efforts at reform. These barriers include:

- **Lack of data on chemical toxicity, use in products, and availability and safety of alternatives.** During the last half century, thousands of chemical substances have been developed and put into commerce, often with little information about or consideration of their environmental or health implications. Scientific information is increasing about some chemicals; yet, for a large percentage of chemical substances, there is still little information on their health implications, and more importantly their exposures, and how they are used throughout supply chains (and the economy). Without adequate health and environmental effects data, it is difficult to assess the risks of chemicals, set science-informed priorities, or feel confident that chemical substitutes are safer than chemicals of concern. Without data on exposures, uses, and supply chain flows, it is impossible to effectively manage chemicals, understand their flows in the economy and environmental fates, or set priorities for interventions. These data limitations stem from the federal level, where current policy inhibits the ability of the federal government, particularly the EPA under TSCA, to share data that has been declared confidential business information (a designation which is easy for manufacturers to make).^{17 18 19}

States are limited in their ability to act if they do not have good data. In fact, uncertainty about the toxicity of a particular chemical of concern or alternatives provides a strong barrier to legislatures and agencies taking action that could have harmful economic impacts. While some states have instituted chemical use and toxicity data generation programs beyond those at the federal level (for example Prop 65 in California and Toxics Use Reduction in Massachusetts), most states continue to face significant barriers in accessing information necessary for informed policy-making.

- **Agency resources and capacity.** Chemicals policy reforms require some level of agency implementation, although the extent of this can vary widely. This is a challenge given that many state environmental agencies have had significant budget reductions over the last decade, and even more so recently. Resources will be necessary for: developing new databases and data collection systems, chemical review, alternatives assessments, stakeholder engagement, developing guidance documents, technical support, and enforcement. Enforcement is particularly important since implementation and compliance will depend both on a serious threat of action if a firm does not comply with requirements as well as support measures to help firms. Many activities, such as new data collection schemes, databases, and assessment protocols, may require a large upfront investment to develop the schemes and capacity. For example, if a state wishes to track chemicals in

¹⁷ Wilson, Chia, and Ehlers, *supra* note 7.

¹⁸ Denison, *supra* note 8.

¹⁹ Government Accountability Office, *supra* note 9.

products in the state (including those coming into the state), it will have to develop some type of product registry system, guidance, and enforcement measures. Despite these resource needs, many legislatures fail to consider the implementation phase of policies in their development. The failure to address fundamental resource needs can result in unfunded mandates and skepticism as to the ability of reforms to occur in practice.²⁰

Capacity is as important as financial resources. Many agencies lack toxicological or risk assessment capacities and others lack strong capacities in pollution prevention and safer chemicals and materials development. Agencies need adequate capacity to allow implementation of new policies. While increasing the budgets of agencies — through increased state budget line item funding or some kind of fee structure on chemicals — is an important step, some of these resource and capacity issues could be resolved through greater intra- and interstate collaboration. For example, environment agencies could collaborate with university centers or other agencies (as is the case in Massachusetts under the Toxics Use Reduction Act) to implement parts of reforms, taking advantage of resources within the state.

These capacity issues also refer to companies implementing chemicals policies as well as the ability of stakeholders to participate in chemicals policy reform dialogs. Many small- and medium-sized companies, where the environment director plays many different roles, lack capacity for large-scale data collection and assessment, implementation of alternatives, or sufficient market power to demand data from suppliers. As such, technical assistance programs must be a critical component of any reform effort for it to be successful.

The financial and resource limitations, coupled with the lack of data on chemicals and alternatives, have led many legislatures to have a limited chemicals reform focus, restricting a single or handful of chemicals of high concern rather than a broader approach that addresses a range of chemicals in industrial processes and products. This challenge is compounded by the current approach to chemicals management in many states, which focuses on conducting detailed, lengthy risk assessments on individual chemicals to determine whether and what actions are warranted. Further, the sheer magnitude and “novelty” of a more holistic approach to chemicals management has worried state legislatures and agencies, which often do not have experience in this area.

- **A lack of intra- and inter-state coordination.** In most states, long-term divisions have existed between environmental and health agencies with regards to chemicals regulation. To date, chemicals regulations have been implemented through environmental agencies. In some states, however, health departments have played some role in chemicals

²⁰ Amy D. Kyle, “Implementation of Chemical Policies within States: Competencies and Institutions,” *in Options for State Chemicals Policy Reform: A Resource Guide*, Lowell Center for Sustainable Production, University of Massachusetts Lowell (Jan. 2008).

assessment and management. Lack of clarity about jurisdiction or multilayered jurisdictions and conflicting missions can lead to conflicts whereby chemicals management activities suffer. Further, economic agencies have rarely been involved in chemicals policy efforts, despite the clear economic implications of chemicals in products. In the European Union, for example, regulation of chemicals is shared between economic and environmental ministries.

As previously indicated, there are hundreds of chemicals policy efforts that have occurred over the past 20 years in the states. Many of these have been relatively coordinated across states, for example pollution prevention efforts that were coordinated through the National Pollution Prevention Roundtable and mercury reduction efforts. In these cases, states have been able to share resources and experiences, and build off one another's programs. However in most cases, states have developed a patchwork of uncoordinated and often conflicting chemicals policies that create burdens for both industry and government. There is an increasing trend for coordination on chemicals policy reforms over the past five years, with advocacy and legislative organizations, such as the National Caucus of Environmental Legislators, sharing information and model policies with legislators in states. Further, state agency experts are increasingly discussing coordination in the implementation phases of policies as they recognize the limits of resources and the urgent need for consistent approaches—for example, prioritizing chemicals of higher or lower concern in the state.

- **Defining safer chemicals.** Given the resource challenges of conducting risk assessments on chemicals and the need to act in a more efficient manner on a greater number of problem chemicals, several states have begun to draft or pass legislation requiring the substitution of a range of chemicals of high concern with safer alternatives. This is a new approach for most agencies that have traditionally focused chemical assessment activities on determining "safe" levels of exposure to problem chemicals and not identifying safer alternatives. Defining what is "safer" and establishing methods for performing alternatives assessments is a critical foundation for the pursuit of these policies. Defensible science-based criteria developed through a transparent process are needed to begin defining "safer alternatives." Currently, there is no broadly accepted method for determining the attributes of a safer alternative chemical, process, or product, although some screening devices, for example the Clean Production Action Green Screen²¹, are beginning to be developed. This lack of a framework for conducting alternatives assessment limits the implementation of these types of policies.
- **Pressure from the regulated community.** In many instances, states developing new chemicals regulations have faced significant lobbying from the regulated community both inside and outside of the states, which have raised concerns about the impacts of policies on industry and that policies may cause industry to move to lower cost regions. State

²¹ Clean Production Action, Green Screen, <http://www.cleanproduction.org/Greenscreen.php>.

legislatures, which often have minimal scientific capacity, and agencies providing support to legislative initiatives, are frequently required to spend significant resources in responding to these concerns, which can divert resources from policy implementation.

(5) Opportunities for the future

Despite barriers, several states are moving forward to reform chemicals policies in a more solutions-oriented, broader, and innovative manner. These innovative efforts demonstrate the influence of the numerous drivers outlined above and the desire of many state governments to be proactive in establishing ground rules for safer products. Three particular areas of future opportunities for states include: increased collaboration and coordination within and between states; increased public and private engagement in chemicals policy efforts; and chemicals policy reform efforts focused on the positive vision of safer alternatives.

- **Increased collaboration and coordination within and between states.** Chemicals policy efforts at the state and local levels have been most effective when there is collaboration and communication within and between states. Multiple levels of collaboration and communication are necessary for states and localities to most effectively and successfully formulate and implement chemicals policy reforms. In order to formulate the most effective policies as well as gain broad-based support for policies, a collective and inclusive process involving all the stakeholders in the development and early discussions of policies is necessary.

As toxic issues are cross-media in nature and because these issues tend to fall somewhere between environment and health agency missions, intra-agency and interagency communication and collaborative efforts within and between environment and public health agencies (and even economic development agencies as the focus of reforms increases to safer alternatives) are necessary during policy formation, policy enactment, and policy implementation. This sort of coordination within states has not been typical in the past. Some states have created new government agencies and new legislative committees to facilitate collaboration between environmental and health experts and to better understand these complex policy issues. For example, Washington, as a result of the complexities faced during the campaign to restrict the use of decaBDE, a brominated flame retardant, created a select committee on environmental health issues in order to deal with these complex issues in the future. Another example is the creation of the Department of Public Health in California in order to facilitate collaboration between environment and health experts. In the state of Maine, environment, public health, and economic development agencies have collaborated on the development of green chemistry models based on the use of potato waste for the manufacture of bio-based plastics. States are increasingly realizing that coordination and sharing resources at the state level is critical to successful policy implementation.

Further, while states have long realized the importance of collaboration in areas such as pollution prevention, the need for collaboration and sharing of information and experience is becoming increasingly evident as states advance broader chemicals policy reforms. Interstate efforts in developing model policy, data gathering, and information sharing have also been shown to be effective at supporting passage of policies in many states as well as promulgating good models of chemicals policy implementation. For example, in restricting PBDE flame retardants, the fact that states had identified alternatives or conducted studies on hazards or environmental fate provided sufficient evidence for restrictions in other states. An example of successful state coordination and collaboration on the implementation of chemicals policies is the Interstate Mercury Education & Reduction Clearinghouse (IMERC).²² IMERC provides ongoing technical and programmatic assistance to states that have enacted mercury education and reduction legislation. Through IMERC, states coordinate on enforcement, help each other to understand changes in technology, and gather and share data to set priorities and take action.

Given the sheer number of chemicals requiring alternatives assessment and the consistent data needs, several states have come together with environmental advocates to establish an Interstate Chemicals Clearinghouse (IC2). The IC2 will serve as a repository of information on chemical toxicity, chemical prioritization, and alternatives to problem chemicals as well as convene discussions to effectively determine how alternatives assessments should be conducted (to ensure consistency across states) and how safer materials should be defined. By unifying the efforts of several states, the IC2 will also be able to coordinate with European efforts under REACH, including possible access to data developed in its implementation. Several proposed or enacted state legislative reforms provide either authorization to join the IC2 and in some cases funding for the Clearinghouse.

- **Increased public and private engagement in chemicals policy efforts.** Over the past several years, there has been heightened public interest in the health risks posed by industrial chemicals. Scientific studies and advocacy campaigns on chemicals in cord blood, dust in homes, dangerous chemicals in toys and children's products, coupled with increasing scientific evidence of links between chemical exposures and adverse health outcomes have significantly raised public concerns about the regulation of chemicals and the need for safer alternatives. State level advocates have been able to engage non-traditional allies in their efforts to effect legislative or executive branch action on chemicals, including health professionals, workers, Parent Teachers Associations, and religious leaders. While five years ago, the general public may have not been informed about chemicals in everyday products (indeed, surveys indicate that the public believes chemicals are well-tested and demonstrated safe before being introduced into products),

²² Northeast Waste Management Officials' Association (NEWMOA), Interstate Mercury Education & Reduction Clearinghouse (IMERC), <http://www.newmoa.org/prevention/mercury/imerc.cfm>.

this perception is rapidly changing. Thus, a significant barrier to chemicals reform may be rapidly changing. Broad public coalitions are pressuring policy makers (or in absence of rapid policy developments, manufacturers) to take action to protect health from chemical exposures. Nonetheless, in many states, policy concerns about climate have often been prioritized over those on chemicals.

There are many opportunities for states and advocates to continue to raise awareness about chemical hazards and safer alternatives. One example is a dry cleaning rating system that is being developed by local government officials in San Francisco. It consists of a numeric rating system for garment cleaners based on the process and the chemical agents utilized in the process. The ratings would be posted in the windows of businesses. This would educate consumers about choices and serve to change consumer use patterns away from the most hazardous dry cleaning processes until harmful chemical agents can be phased out. Another example, used by a non-governmental organization in Oregon, is an ecohealthy childcare program. This program consists of a checklist of actions that childcare facilities can undertake to make the facility less chemically threatening. If the facility completes a large proportion of these actions, it can be certified as "ecohealthy." The program operates as both an educational tool for childcare providers and parents and a marketing tool for the childcare providers.

Several states have used body-burden data or other health studies as an opportunity to prioritize chemicals, to educate the general public on chemicals issues, to make chemicals issues seem more tangible to the general public, and to establish sufficient evidence of exposure. Finally, some states have attempted to frame chemical concerns for the general public in state-specific or population-specific issues, such as protecting Puget Sound in Washington or protecting children in Maine.

- **Chemicals policy reform efforts focused on a positive vision of safer alternatives.** The "positive" focus on safer alternatives to problem chemicals has been a particularly important transitional shift in state-level activities on chemicals policy reform. In part due to concerns about negative economic impacts of policies, policy makers want to be assured that feasible, cost-effective alternatives exist for chemicals that may be subject to restrictive actions. Advocates and others have recognized that a focus on safer alternatives places those advocating for reforms in a position of advocating for positive changes – they are not against a particular chemical or industry or company, they are for safer alternatives. Further, such a focus helps to ensure that the transition to alternatives occurs in a way that does not create new problems, which could harm efforts to take action at a future time.

There are increasing efforts in several states (Maine, Massachusetts, and Washington) to harness the opportunity for state and local governments to develop the "green economy," promote innovation, and encourage economic development through the use of chemicals

policy. This also provides the opportunity to involve industry in the development of chemicals policy. This acknowledges that sometimes the best solutions to problematic chemicals come from those who develop chemicals and those who develop products and processes that use chemicals. Additionally, the promotion of greener solutions helps ensure that, in the development of chemicals policy, innovative businesses gain market opportunities that they otherwise may not have had. For example, formaldehyde legislation in California was supported by an innovative private sector firm that created formaldehyde-free products and wanted to gain a market advantage over other companies that were still using formaldehyde in their products.

As such, advocates in several states are making the business case for chemicals policy reform – examining both the costs of not taking action and the benefits that could be derived by acting on chemicals of concern.

CONCLUSION

This analysis has shown that states and local governments have and continue to be leaders and innovators in developing a broad range of chemicals policies and instruments, serving as laboratories for experimentation. This has been particularly true in the past five years, given the lack of federal initiative to reform the 30-year-old Toxic Substances Control Act, the passage of broad chemicals reform legislation in Europe, and growing public concern about the dangers of chemicals in every day products. It is often easier to enact and implement policies at the state and local levels as opposed to the federal level, due to the smaller size, homogeneity in many states, and well-coordinated advocacy coalitions. States and localities are closer to the source of the chemicals and can often address these issues more effectively. Ultimately, the development of a variety of programs and approaches to chemicals regulation at the state and local levels will serve, as has historically been the case, as building blocks for developing a comprehensive approach to chemicals policy at the federal level.

States have an ability to be more innovative than the federal government, using policies that cross traditional jurisdictional boundaries, apply to multiple media, and focus on both problems and solutions. This innovation is showing in some of the more recent policy developments in states such as Maine, Washington, Massachusetts, California, New York, Oregon, and Michigan, where policy makers have passed or are discussing policies that encompass multiple chemicals (both industrial, pesticides, and cosmetics), focus on both rapid chemical prioritization and safer alternatives, and provide incentives for green chemistry—the design of chemicals that are inherently less hazardous throughout their lifecycles. It is also showing in the heightened desire of state agencies to collaborate on sharing data on chemical uses, hazards, and in particular, alternatives.

The focus of chemicals policy at the state level is changing from one based on chemical wastes from manufacturing facilities to one focused on chemicals in products and their impacts throughout

the product lifecycle. It is further moving from a reactive approach of restricting a few chemicals of concern without considering alternatives to one that stimulates application of safer alternatives to problem chemicals. Additionally, several states are discussing the infrastructure necessary to assist industry and other stakeholders in this transition, such as institutes modeled after the New York Pollution Prevention Institute and the Massachusetts Toxics Use Reduction Institute. In essence, several states are moving from “toxics” policy towards comprehensive chemicals policy, recognizing the health, efficiency, and economic benefits of a broader approach to chemicals regulation.

States have a long way to go, however, in this transition of focus within chemicals policy. Traditional approaches to chemicals regulation involving restrictions of a few single chemicals are generally easier from an administrative perspective. Collecting information on chemicals in products, undertaking safer alternatives assessments, and assisting the transition to such alternatives requires new skills, infrastructure, and institutional structures that may be hard to establish in difficult economic climates currently faced in many states. Further, certain elements of chemicals policy reform, such as toxicity testing and development of tools and approaches for alternatives assessment and green chemistry, may be more effective at a federal level, while other elements, such as data on chemical uses or alternatives implementation would be more effective at the state level.

Despite the challenges ahead, state initiatives are likely to continue to set the context for federal policy reforms. The recent amendments to the Consumer Product Safety Act prohibiting certain phthalates and federal efforts on alternatives to polybrominated diphenyl ethers are examples of federal chemicals policies driven by activities at the state level. The current federal discussions on legislation to reform the Toxic Substances Control Act, called the Kid Safe Chemicals Act, is in large part developing from state level innovation and advocacy. However, the federal chemicals policy reform discussion has not reached the level of maturity and innovation that has occurred in several states. It is therefore incumbent on the states to continue their critical role in influencing the development of integrated, solutions-oriented chemicals policy at the state level into the future.

APPENDIX A: POLICY CATEGORIES IDENTIFIED AT THE STATE AND LOCAL LEVEL

Policy Category	Definition	Policy Landscape at State/Local Levels	Examples ²³
Pollution Prevention/ Toxics Use Reduction	Multi-pollutant, multi-media strategies that shift the focus from end-of-pipe regulation to reduction of pollution at the source and/or encourage changes in production processes, product, or raw materials to reduce, avoid, or eliminate the use of toxic or hazardous substances or the generation of hazardous byproducts.	Following federal pollution prevention legislation in 1990, many states enacted similar pollution prevention laws. Although the majority of states have set pollution prevention goals, there is a wide variety of programs and policies set up to achieve these goals at the state level. Some states simply have aspirational goals for pollution prevention, while others have voluntary pollution prevention programs that provide technical assistance to businesses. Only a small number of these regulations/programs actively require, facilitate, or encourage the use of least toxic alternative chemicals. Additionally, most of these programs focus exclusively on reducing toxics in industrial settings, but some states are trying to extend these policies and programs to small businesses and households. Further, elements of pollution prevention and toxics use reduction are incorporated into other state policies, especially policies that focus on procurement and policies that focus on greening government management and operations.	<ul style="list-style-type: none"> • Enacted—Massachusetts Toxic Use Reduction Act (TURA); Oregon Toxics Use Reduction and Hazardous Waste Reduction Act; New Jersey Pollution Prevention Act • Proposed—New York (A348, S2256); California (AB558)
Single Chemical Restrictions	Policies that ban or severely restrict specific chemicals or uses of chemicals.	This type of policy is most prominent at the state and local levels. A number of chemicals have been banned or restricted in some states and localities. In addition, there is proposed legislation in a number of states and localities to ban or restrict single chemicals. The chemicals targeted by these policies include: PBDEs, lead, mercury, chromated copper arsenate, chlorinated solvents, dioxin, formaldehyde, perchloroethylene, phthalates, bisphenol A, and diacetyl.	<ul style="list-style-type: none"> • Enacted—Washington PBDE Ban (Wash. Rev. Code Ann. § 70.76.005); Maine PBDE Ban (Me. Rev. Stat. Ann. tit. 38, § 1609); Rhode Island Mercury Reduction and Education Act • Proposed—Illinois Bisphenol A Products Act (HB4744); New York (various bills on restriction of lead-A1745, S782)

²³ Although instructive examples are listed for each policy category, it is important to note that in many cases, the policies listed span multiple policy categories. More than one policy category is denoted in the State Chemicals Policy Database for policies that contain elements of more than one policy category. More information about the policies listed as examples can be found in the State Chemicals Policy Database, accessible at <http://www.chemicalspolicy.org/uslegislationsearch.php>.

Policy Category	Definition	Policy Landscape at State/Local Levels	Examples
Multiple Chemical Policies	Policies that regulate groups/classes of chemicals, rather than just one chemical.	Most of the legislation that has been enacted at the state and local levels to regulate groups of chemicals focuses on persistent, bioaccumulative, and toxic chemicals (PBTs). Enacted and proposed legislation in a number of states focuses on “chemicals of concern” or “priority chemicals.”	<ul style="list-style-type: none"> • Enacted—Executive Orders to reduce PBTs (WA, OR); Local resolutions to reduce PBTs (Seattle, WA; Buffalo, NY; Erie County, NY); Priority Chemicals (CA, CT, ME, WA) • Proposed—An Act Providing for Safer Alternatives to Toxic Chemicals (MA S2481); Toxic Chemicals in Children’s Products (RI H7098)
Regulation of Product Categories	Policies that regulate categories of consumer products. These types of policies include regulating chemical use in products, encouraging the purchase/use of less toxic products, and labeling/disclosing chemicals in products.	Instead of regulating single chemicals, some states and localities are beginning to regulate and propose legislation that would place restrictions on chemicals in categories of products, encourage the purchase and use of less toxic products, and require the labeling/disclosure of chemicals in products. To date, states and localities have enacted or proposed legislation for a number of product categories, including cosmetics/personal care products, cleaning products, children’s toys/child care products, and product packaging.	<ul style="list-style-type: none"> • Enacted—California Safe Cosmetics Act; New York School Green Cleaning Law; Connecticut Toxics in Packaging Law; California Phthalates in Products for Young Children (AB1108); An Act Concerning Child Product Safety (CT HB5650) • Proposed—Illinois Safe Cosmetics Act; Massachusetts Safer Cleaning Products Act (H2246); Children’s Product Safety Act (IL HB4351); Maryland Phthalates and Bisphenol A Prohibitions-Toys, Child Care Articles and Cosmetics (HB833)
Biomonitoring/ Environmental Health Tracking and Surveillance Systems	Policies that support assessment of human biologic specimens (blood, urine, breast milk, fat tissue) to characterize the levels of human chemical exposure. Policies that require tracking and monitoring of the links between exposures to chemical/environmental hazards and adverse human health effects.	The establishment of biomonitoring programs and environmental health tracking systems is increasingly seen as a way to understand the general population’s exposure to chemicals as well as a powerful advocacy tool. Since the exposure and disease profile varies geographically, state and local biomonitoring programs are needed to collect this type of information. California, a leader in this area, enacted a state-wide biomonitoring program in 2006. Other states have enacted and proposed these types of initiatives, but lack the necessary resources to implement this type of legislation.	<ul style="list-style-type: none"> • Enacted—California Environmental Contaminant and Biomonitoring Program; Illinois Biomonitoring Feasibility Study Act • Proposed—New York Environmental Health Tracking System (A5343, S5298); Tennessee Environmental Contaminant Biomonitoring Program (HB757, SB878)

Policy Category	Definition	Policy Landscape at State/Local Levels	Examples
Data Collection	Policies that encourage the gathering and dissemination of information about the presence, toxicity, and/or use of chemicals in products and processes. These types of policies may require further research and testing of specific chemicals to assess potential health and environmental impacts, the establishment of monitoring programs to detect the presence of contaminants in the environment, or the manufacturer's or distributor's submission of chemical production and use information.	There is increasing recognition of the data gaps that exist with respect to the properties of chemicals as well as chemical use and exposure data. California is a leader on enacting and proposing these types of policies. Other states recognize the importance of gathering this information, but lack the necessary resources to enact legislation that establishes data collection programs at the state level. However, some recently enacted and pending legislation in a number of states contains provisions that permit the state to collect chemical use and production information about priority chemicals.	<ul style="list-style-type: none"> • Enacted—California Chemical Testing Methods (AB289); Maine Act to Protect Children's Health and the Environment from Toxic Chemicals in Toys and Children's Products (Me. Rev. Stat. Ann. tit. 38, § 1691) • Proposed—California High Production Volume Chemical Data Collection (AB578); Illinois Child Safe Chemical Act (HB5705, SB2868)
Right-to-Know	Policies that require or encourage the provision of information or disclosures about exposures and health risks associated with chemicals to the general public.	Some right-to-know policies at the state and local level build on existing federal legislation (Emergency Planning and Community Right-to-Know Act) and require users of hazardous substances to publicly report those uses. Other state right-to-know legislation focuses on the labeling of consumer products to inform the general public of the chemical content of these products. Some of the enacted and proposed mercury products and cosmetics legislation has included provisions that require labeling of these products. Some of this legislation also includes public education programs.	<ul style="list-style-type: none"> • Enacted—California Safe Drinking Water and Toxic Enforcement Act (Prop. 65); California Toxics Information Clearinghouse (SB509); City of Eugene Oregon Toxics Right-to-Know Charter Amendment; New Jersey Worker and Community Right-to-Know Act • Proposed—An Act Concerning Toxic Substances in the Workplace (CT SB1022)

Policy Category	Definition	Policy Landscape at State/Local Levels	Examples
Prioritization	Policies that establish a framework for assessing and prioritizing chemicals.	Although prioritization of chemicals is widely seen as a necessary step for chemicals policy, states are just beginning to develop and implement frameworks to achieve this goal.	<ul style="list-style-type: none"> • Enacted—California AB1879; Maine Act to Protect Children’s Health and the Environment from Toxic Chemicals in Toys and Children’s Products (Me. Rev. Stat. Ann. tit. 38, § 1691); An Act Concerning Child Product Safety (CT HB5650); Washington Children’s Safe Products Act (HB2647) • Proposed—Establishing the Toxic Substances Identification Program (VT S292); Chemicals in Children’s Products (WI AB968)
Alternatives Assessment	Policies that encourage research to support or establish requirements to replace the use of toxic chemicals with the use of alternatives that have been carefully and methodically evaluated for safety (i.e. substitution).	Some states have enacted or proposed policies to establish research institutions solely to conduct alternatives assessment and encourage the substitution of toxic chemicals with safer alternatives. In addition, other policies enacted at the state and local level encourage alternatives assessment. For example, some policies that ban or restrict single chemicals also contain provisions that require the assessment of alternative chemicals to choose an appropriate substitute for the banned/restricted chemical.	<ul style="list-style-type: none"> • Enacted—Massachusetts Toxic Use Reduction Institute; New York Pollution Prevention Institute; Maine Executive Order Promoting Safer Chemicals in Consumer Products and Services • Proposed—Connecticut Innovation Institute (HB7020)
Green Chemistry/ Design for the Environment	Policies that encourage the redesign of chemicals, products, and processes from the outset to reduce or eliminate the use and generation of hazardous substances.	There has been executive branch action to encourage research and investment in green chemistry in a few states. In addition, these principles are beginning to be incorporated into legislative initiatives.	<ul style="list-style-type: none"> • Enacted—Michigan Green Chemistry Executive Directive; California Green Chemistry Initiative • Proposed—California Design for the Environment (SB291)

Policy Category	Definition	Policy Landscape at State/Local Levels	Examples
Product Stewardship	Policies that establish an environmental management strategy for minimizing a product's environmental impact throughout all stages of a product's life cycle.	Managing a product from cradle to grave has become an increasing concern at the state and local levels, especially as more chemicals are banned. There are a number of product stewardship schemes that are being proposed, although many of the policies focus on producer responsibility for managing products throughout their life cycle. Most of the legislative action (enacted and proposed) to date on product stewardship has focused on electronics equipment. Additionally, some of the mercury laws include collection and recycling provisions for products containing mercury.	<ul style="list-style-type: none"> • Enacted—Oregon Producer Responsibility System for the Management of Obsolete Electronics • Proposed—North Carolina Manufacturer Responsibility and Consumer Convenience Information Technology Equipment Collection and Recovery Act (SB1525); Pennsylvania Used Electronic Device Recycling Act (HB7)
Environmentally Preferable Purchasing	Policies that require or encourage the purchase of products based on particular environmentally sensitive attributes (i.e. less toxic chemicals, recycled material content, energy efficiency, etc.).	There are myriad environmentally preferable purchasing policies at the state, and especially local level. Both legislative and executive branch initiatives at the state and local level require or encourage more environmentally preferable state and local government purchasing decisions for a wide range of products. Some of these policies are more aspirational, while others lay out a decision-making process for choosing products.	<ul style="list-style-type: none"> • Enacted—San Francisco, CA Precautionary Purchasing Law; California State Agency Environmentally Preferable Purchasing; Vermont Clean State Program • Proposed—Colorado Act Concerning a Preference for the Purchase of Environmentally Preferable Products by Government Entities (HB1220); New York State Safe and Green Procurement Act (A7038, S1158)
Precautionary Principle	Policies that define and develop approaches for applying the precautionary principle in practice for chemicals.	One state has enacted a senate resolution that incorporates the precautionary principle into state department and agency decision-making processes. A number of localities have also enacted precautionary principle resolutions that incorporate the principle into decision-making processes.	<ul style="list-style-type: none"> • Enacted—Hawaii Precautionary Resolutions (HCR49, SR86); Local Precautionary Principle Resolutions (Seattle, WA; San Francisco, CA; Berkeley, CA; Marin County, CA; Multnomah County, OR) • Proposed—New York State Public Health Protection Act (A3420, S862)

APPENDIX B: A SUMMARY OF THE DATABASE FINDINGS FOR THE THIRTEEN IDENTIFIED POLICY CATEGORIES

POLICY CATEGORY ²⁴	DETAILED OVERVIEW OF POLICIES AT THE STATE AND LOCAL LEVEL ²⁵
Pollution Prevention/Toxic Use Reduction	<ul style="list-style-type: none"> • 39 states have enacted or proposed pollution prevention and/or toxic use reduction policies. • Two counties and two cities have enacted pollution prevention policies.
Single Chemical Restrictions	<ul style="list-style-type: none"> • <u>Mercury</u>—32 states, four counties, and 21 cities have enacted or proposed legislation that bans or significantly restricts the use of mercury. • <u>PBDEs</u>—17 states (AK, CA, CT, HI, IL, ME, MD, MI, MN, MO, MT, NC, NY, OR, RI, VT, WA) have enacted or proposed legislation restricting the use of certain PBDEs, including pentaBDE, octaBDE and decaBDE. • <u>Lead</u>—14 states (CA, CT, DE, IL, IN, LA, ME, MD, MA, MI, MN, NH, VT, WA), one county (Vilas County, WI), and one city (Baltimore, MD) have enacted legislation prohibiting the use of lead in certain consumer products, including pipes, wheel weights, fishing tackle, tableware and housewares, cosmetics, children's and adult jewelry, children's products, children's toys, candy, lunch boxes and other novelty consumer products. 19 states (AL, CA, IA, IL, IN, KY, MA, MD, ME, MI, MN, MS, NE, NJ, NY, PA, SC, TN, WA) have proposed this type of legislation or executive branch policy. • <u>Phthalates</u>—Three states (CA, VT, WA) and one city (San Francisco, CA) have enacted and 19 states (AL, CT, HI, IL, IN, ME, MD, MA, MN, MO, MS, NJ, NM, NY, OR, PA, RI, SC, WV) have proposed legislation banning phthalates. Hawaii has enacted legislation to further investigate the use of phthalates in children's products and Minneapolis, MN has enacted legislation urging the state of Minnesota to phase out phthalates in children's products. • <u>Bisphenol A</u>—Two states (CT, MN), one county (Suffolk County, NY) and two cities (Chicago, Illinois and San Francisco, CA) have enacted and 21 states (CA, CT, HI, IL, ME, MD, MA, MI, MN, MO, MS, MT, NJ, NM, NY, OR, PA, RI, TX, VT, WA) and two counties (Schnectady County, NY and Albany County, New York) have proposed legislation restricting the use of bisphenol A in children's toys, child care products, and packaging. Hawaii has enacted legislation to further investigate the use of bisphenol A in children's products, Pennsylvania has enacted a resolution urging Congress and the FDA to reduce the levels of bisphenol A in plastic food containers, plastic bottles, and the lining of cans, Chicago, IL has enacted a resolution urging the FDA to expedite its current review of the safety of bisphenol A and take appropriate action based on its findings, and Minneapolis, MN has enacted legislation urging the state of Minnesota to phase out bisphenol A in children's products. • <u>Perchloroethylene</u>—One state (CA) and two counties (Orange County, CA and Los Angeles County, CA) have enacted and four states (MA, NJ, NY, VT) have proposed legislation regulating perchloroethylene. • <u>Formaldehyde</u>—One state (CA) has enacted legislation regulating formaldehyde emissions from toxic wood products. One state (MA) has declared formaldehyde a hazardous substance and has declared urea-formaldehyde foamed in-place insulation to be a banned hazardous substance. One state (NH) prohibits the manufacture or sale of urea-formaldehyde foam insulation and prohibits the sale of any particle board or fiber board containing urea-formaldehyde resin without a written cautionary statement to the purchaser.

²⁴ For definitions and instructive examples of the policy categories listed here, see http://www.chemicalspolicy.org/downloads/PolicyChart_000.pdf.

²⁵ For more details on individual policies, see the US State Level Chemicals Policy Database, <http://www.chemicalspolicy.org/uslegislationsearch.php>.

POLICY CATEGORY	DETAILED OVERVIEW OF POLICIES AT THE STATE AND LOCAL LEVEL
Multiple Chemical Policies	<ul style="list-style-type: none"> • <u>PBTs</u>—Two states (ME, OR) have executive orders that advance a commitment to phase out PBTs. One state (WA) has passed an executive order and enacted legislation that requires the development of chemical action plans for PBTs. One state (OR) has enacted legislation to prioritize and study persistent pollutants discharged in the state. One state (AK) has proposed legislation to develop a list of PBTs. One county (Erie County, NY) and four cities (Buffalo, NY, Bellingham, WA, Olympia, WA, Seattle, WA) have passed resolutions to encourage the reduction of pollution from PBTs, encourage the purchase of products that do not contain PBTs, and stimulate the development of alternatives to PBTs. • <u>Priority Toxic Substances</u>—One state (CA) has enacted legislation to create a process for identifying and prioritizing chemicals of concern. Five states (CA, CT, MA, NY, VT) have proposed legislation that focuses on identifying and prioritizing toxic substances. Four states (CT, ME, MN, WA) have enacted and nine states (AL, IL, IN, MI, OR, PA, RI, SC, WI) have proposed legislation that seeks to identify and regulate priority chemicals in children's products. • <u>High Production Volume Chemicals</u>—proposed in one state (CA). • <u>Xenoestrogens</u>—proposed in one state (PA). • <u>Toxic Substances in Children's Products</u>—proposed in one state (MI). • <u>Carcinogens, Teratogens, Reproductive Toxicants, and Developmental Toxicants in Children's Products</u>—proposed in one state (TX). • <u>Hazardous Substances</u>—enacted in 17 states (CA, CO, CT, IL, IN, MA, MD, MI, MT, OR, OH, NH, ND, SC, TN, TX, WI).
Regulation of Product Categories	<ul style="list-style-type: none"> • <u>Toxics in Packaging</u>—19 states have enacted toxics in packaging laws. • <u>Cleaning Products</u>—Three states (CT, NJ, NY) have executive orders that require state agencies to purchase and use environmentally preferable cleaning products. One state (WI) has an executive order requiring the establishment of sustainable building operation guidelines for state facilities, including green cleaning. Three states (FL, IL, WA) have proposed legislation that requires state agencies to purchase and use environmentally preferable cleaning products. Two counties (Nassau County, NY, Multnomah County, WA) have enacted policies that require county facilities to purchase and use environmentally preferable cleaning products. Four cities (Chicago, IL, Boston, MA, Minneapolis, MN, New York City, NY) have enacted policies that require city facilities to purchase and use environmentally preferable cleaning products. Four states (IL, ME, MO, NY) have enacted and twelve states (CA, CT, HI, IA, MD, MN, MS, NV, OR, RI, VA, VT) have proposed legislation that requires schools to purchase and use environmentally preferable cleaning products. One state (NJ) has proposed legislation that would regulate the purchase and use of cleaning products in hospitals, one state (MA) has proposed legislation that would regulate the purchase and use of cleaning products in schools, hospitals, healthcare facilities, daycare centers, public buildings and public housing, and one state (CA) has proposed legislation that would require the evaluation of cleaning products used to clean supermarkets. • <u>Children's Products or Toys</u>—Ten states (CA, CT, DE, HI, IL, ME, MD, MN, VT, WA), two counties (Suffolk County, NY and Albany County, NY), and two cities (San Francisco, CA, Minneapolis, MN) have enacted legislation that regulates children's products or toys. 31 states and one county have proposed legislation that would regulate children's products or toys. • <u>Cosmetics and Personal Care Products</u>—Three states (CA, OR, WA) have enacted and ten states (CA, CT, IL, MD, MN, ND, NJ, NY, OR, WA) have proposed legislation that regulates cosmetics and personal care products.

POLICY CATEGORY	DETAILED OVERVIEW OF POLICIES AT THE STATE AND LOCAL LEVEL
Biomonitoring/Environmental Health Tracking and Surveillance Systems	<ul style="list-style-type: none"> • Three states (CA, IL, MN) have enacted and three states (IN, TN, WA) have proposed biomonitoring legislation. • One state (NY) has proposed legislation that would establish an environmental health tracking system.
Data Collection	<ul style="list-style-type: none"> • Seven states (CA, HI, IL, ME, MN, OR, WA) and one city (Berkeley, CA) have enacted legislation containing data collection mechanisms. • Nine states (Connecticut, Louisiana, Maine, Massachusetts, New Hampshire, New York, North Carolina, Rhode Island, and Vermont) have enacted mercury products legislation that includes provisions requiring notification for mercury-added products. • Seventeen states (AL, CA, HI, IL, IN, MA, MI, MN, ND, NY, OR, PA, SC, VA, VT, WA, WI) have proposed legislation containing data collection mechanisms.
Right-to-Know	<ul style="list-style-type: none"> • One state (CA) has enacted two pieces of legislation and passed a referendum that achieve broad right-to-know goals. • Many other states have enacted legislation that includes right-to-know elements, such as <u>labeling</u> [labeling requirements for mercury-added products (10 states), products containing lead (two states), labeling requirements for lighting containing mercury (three states, one county, two cities), labeling of bisphenol A free products (one city), labeling of wood treated with chromated copper arsenate (one state), labeling of products containing banned hazardous substances (seventeen states)] and <u>education programs</u> [dioxin education program (one state), mercury education program (one state), consumer education regarding chemicals in consumer products (one state)].
Prioritization	<ul style="list-style-type: none"> • Six states (CA, CT, ME, MN, OR, WA) have enacted legislation that establishes a framework for assessing and prioritizing chemicals. • Fourteen states (AL, CT, IL, IN, MA, MI, MN, NY, OR, RI, PA, SC, VT, WI) have proposed legislation that establishes a framework for assessing and prioritizing chemicals.
Alternatives Assessment	<ul style="list-style-type: none"> • One state (CA) has enacted legislation that mandates the creation of methods for analyzing alternatives to existing hazardous chemicals. One state (CT) has proposed legislation to establish a research institution to conduct alternatives assessment and encourage the substitution of toxic chemicals with safer alternatives. One state (WA) has proposed legislation that requires the development of a safer chemical alternatives research and development program. One state (MA) has incorporated alternatives assessment as a key element of Toxic Use Reduction program and pending legislation would require alternatives assessments for high concern chemicals. One state (ME) has issued an executive order promoting safer chemicals in consumer products and services. • Three states have enacted and eight states have proposed legislation that would enhance current alternative assessment efforts through the establishment of a framework for prioritizing chemicals, identifying safer alternatives and encouraging substitution where safer alternatives exist. • Many pieces of enacted and proposed legislation that bans or restricts single chemicals also contain provisions that require the assessment of alternative chemicals to choose an appropriate substitute for the banned or restricted chemical. Such provisions can be found in legislation that bans or restricts: perchloroethylene (two states, two counties); phthalates and bisphenol A (twelve states); PBDEs (eleven states); chlorinated solvents (one state); and chromated copper arsenate (one state, one city).

POLICY CATEGORY	DETAILED OVERVIEW OF POLICIES AT THE STATE AND LOCAL LEVEL
Green Chemistry/Design for the Environment	<ul style="list-style-type: none"> • One state (MI) has issued a Green Chemistry executive directive and one state (CA) has commenced a green chemistry initiative. • One state (MI) has proposed legislation that would provide tax and financial incentives for green chemistry research. • One state (MN) has enacted legislation that requires a report with recommendations on incentives for product design that uses green chemistry and has proposed legislation that requires the development of a comprehensive framework for promoting chemistry and chemical engineering involved in the design of products that reduce or eliminate risks to health or the environment.
Product Stewardship	<ul style="list-style-type: none"> • <u>Framework Legislation</u>—5 states have proposed legislation that establishes extended producer responsibility as policy and gives state government agencies the authority, through regulation, to address multiple products over time. • <u>Electronic Waste</u>—38 states and three cities have enacted or proposed legislation providing for the management of obsolete electronics. • <u>Mercury-Added Products</u>—31 states, two counties, and seven cities have enacted or proposed legislation providing for the collection and recycling of mercury-added products. • <u>Wood Containing Chromated Copper Arsenate</u>—One state has proposed and one city has enacted legislation that provides for the end-of-life management of wood containing chromated copper arsenate.
Environmentally Preferable Purchasing	<ul style="list-style-type: none"> • 18 states, 15 counties, and 25 cities have enacted environmentally preferable purchasing policies.
Precautionary Principle	<ul style="list-style-type: none"> • One state (HI), two counties (Marin County, CA and Multnomah County, OR), and four cities (San Francisco, CA, Berkeley, CA, Portland, OR, and Seattle, WA) have enacted precautionary principle policies. • Two states (NY, WA) and one city (Ann Arbor, MI) have proposed precautionary principle policies.

State Leadership in Formulating and Reforming Chemicals Policy

ACTIONS TAKEN AND LESSONS LEARNED

In the United States, states have historically taken a leadership role in innovations in environmental and health policies. Chemicals policy is no exception. This report examines states' efforts in reforming the way chemicals in commerce are managed and analyzes chemicals policies that have been proposed or implemented at the state level.

This document is available at
www.chemicalspolicy.org/publications.shtml
and www.sustainableproduction.org.



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