

DEPARTMENT OF TOXIC SUBSTANCES CONTROL
CALIFORNIA GREEN CHEMISTRY INITIATIVE
PHASE 2 – KEY ELEMENT TEAMS

EMPOWER CONSUMERS TO MAKE INFORMED CHOICES
DISSEMINATE INFORMATION ON TOXIC CHEMICALS
STRATEGIC INTERNATIONAL PARTNERSHIPS

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California's leadership position in information technology should be leveraged to develop new ways to communicate chemicals and toxicity to the public. Information about toxicity in products should appear proximate to the products as an information label or notice. Public awareness campaigns similar to the Flex Your Power program could also help close information gaps and increase public demand for green products. California can also leverage its position as the United States' largest consumer market by entering into memoranda of understanding with the European Union and Canada to share information about toxic chemicals. Such information is already being collected under the 2007 Registration, Evaluation and Authorization of Chemicals initiative (EU REACH) in Europe and the "domestic substances list" generated under the *Canadian Environmental Protection Act* (CEPA) of 1999. California's participation would help harmonize these international efforts.

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EXECUTIVE SUMMARY

The three interconnected aspects of this key element focus on developing consumer outreach methods and information, information technology options for collecting and distributing information, and international cooperation and collaboration partnerships to share information. Conveying information about both toxic substances and the absence of toxic substances in products to consumers, retailers and manufacturers is key to

stimulating demand for green products and “greening” the marketplace. It is important to recognize, however, that different target audiences require different messages and different means of delivering it. While convenience is important to consumers for whom outreach and proximate chemical information will be needed, completeness and comprehensiveness will be important to other stakeholders, such as producers or researchers, for whom methods to manage and distribute large amount of complex chemical information must be developed.

Not only is developing and implementing an appropriate and effective system of information delivery essential to this key element, but the data itself is also critical. Methods to acquire, assemble, compile and generate this information will be enhanced by a collaborative relationship with other governments at all levels, including international, national, state and local governments, to share the data collected by all chemicals policy programs. Because data and information are often considered a valuable commodity and typically a limiting factor in an efficient marketplace, all parties will benefit from a true partnership with reciprocal data exchange.

To successfully disseminate information about chemicals in products and empower consumers to make informed choices the key element team recommends that California concurrently pursue a number of activities. Namely, the state should design and implement an outreach, marketing and communication plan that takes into consideration the target audience, message, and information to be conveyed, as well as the most appropriate means for delivering those messages and methods for monitoring outcomes and adjusting the approach. The state should also facilitate development of a management and technology infrastructure for chemicals and product information by determining the types, amounts and quality of available information and needs for translating, as well as determining the best methods for managing chemical information and making it accessible to stakeholders by teaming with public and private information management and technology partners, such as Google, to create an innovative solution. Finally, the state should establish contacts with and open negotiations for MOU-type agreements with Canada, the EU, Massachusetts, Maine and other western states to share product and chemical information.

INTRODUCTION

This chapter addresses three distinct, but related, aspects of the first key element (disseminate information on toxic chemicals and empower consumers to make informed choices):

- methods for disseminating information about toxic chemicals for consumers;
- the information technology options available for cost-effectively transmitting information; and
- the means for leveraging relationships with other nations, states and private organizations to maximize the types and amount of information that can be made available.

The overarching goal of these three components is to enhance and facilitate public consumer, retailer and producer demand for more sustainable chemicals and products containing safer ingredients, by increasing awareness and knowledge of the safety and toxicity of various chemicals. Through this increased awareness and knowledge,

communities will be mobilized to prefer and “demand” greener chemicals and products and support public policy approaches that help make them safer, more common and easily identified.

To evaluate and develop the steps for implementing this key element, an interagency team comprised of participants with expertise, experience and interest in information collection and dissemination was joined by external stakeholders with the same expertise and experience to discuss potential options and suggest milestone tasks for the implementation plan. This chapter presents the findings of the key element team, addressing the three components of the key element separately to distinguish the issues and strategies of each.

Marketing and Outreach

Stakeholders identified consumer and public outreach as a cornerstone to California’s Green Chemistry Initiative. Successful marketing and outreach will educate the public, consumers and retailers about chemicals and products in a meaningful and useful way to empower everyone, including manufacturers, to make better, more informed choices, create demand for safer solutions and shift product development to “benign by design” options. Essential elements of a marketing and outreach campaign include:

- Creating a coherent message directed at and appropriate for the targeted audiences
- Embracing a wide variety of creative approaches for communicating information
- Making additional, more detailed chemical information available to the public, when possible (such as through websites or hot lines)
- Evaluating outcomes to adjust the message or methods and influence policy decisions

Information Technology (IT)

As manufacturers, retailers, consumers, workers and the general public begin to seek more, and better, information about chemicals and products, the methods for collecting that information and making it available will become increasingly complex and require innovative IT approaches. The Green Chemistry Initiative should use tools that will provide access to the widest audience possible and accelerate the flow of relevant information. At a minimum, the system established to compile available information should be able to:

- Organize the collection and dissemination of existing and new information, such as summarize new studies, and disseminate essential concepts through electronic newsletters, model policies and educational materials;
- Identify, prioritize and research existing limitations or uncertainties with chemical information;
- List safer alternatives for high hazard chemicals;
- Maintain registry of producers and users of high hazard chemicals;
- Provide a forum for requesting exchange and/or sharing additional information (e.g., blogs, peer-to-peer technical assistance networks)
- Create and organize a decentralized database for chemicals information;
- Develop web-based training and education, including podcasts, videos, presentations, references, and peer-to-peer information exchanges among experts

Forging Strategic Partnerships

To maximize existing and future resources and fully tap all information sources, California must collaborate with international, national and state governments and organizations to collect data as it becomes available. As other green chemistry policies are enacted nationally and internationally, the amount of information gathered about chemicals and products will begin to expand and California should capitalize on the other programs in foreign governments, the United States and private organizations as sources of data and models for information collection and use. This cooperative approach will provide reciprocal benefits to the other governments as information from California's green chemistry efforts are added to the global chemical database.

THE CHALLENGE

The collective challenge for this key element is two-pronged. That is, the state must determine both what useful and meaningful information to disseminate and the most effective means of collecting, protecting (if needed) and delivering it. The information that various stakeholders need to act upon their concerns is widely dispersed among a variety of sources, if it exists at all. Not only is the information about chemical and product safety, or danger, often not available to the public, retailers, consumers, workers or manufacturers, but comprehensive, verifiable, accessible chemical and product information is also not available from a single source.

Furthermore, the information in existing chemical databases typically require a further "translational" or "synthesis" step in order to be useful to a lay person or average consumer or retailer. Information translation may be needed because conclusions about product safety may be difficult for the average person to determine using only information about the chemicals they contain. This challenge is compounded by the ongoing problem of not knowing what chemicals the products contain. In addition, while the emphasis on human toxicity is understandable, other data also would be helpful for advancing a more sustainable future. For example, data regarding life cycle impacts could help consumers make more informed decisions when considering the purchase of one product over another.

The lack of available information about chemicals and their uses remains one of the major issues in the management of chemicals. The extent of this "data gap" is sizeable and has been described at length in other reports and the first phase of the Green Chemistry Initiative¹. While several thousand chemicals used in commerce today have some evidence of toxicity, including carcinogens and reproductive toxins, tens of thousands of additional chemicals in commerce do not yet have widely available information. This lack of information not only stymies efforts to identify which chemicals may pose harm, but also makes decisions about specific chemical alternatives or substitutes difficult to determine; in some instances the best alternative for consumers is to seek to avoid products containing chemicals with missing information. This situation will improve over time, as the data gap is addressed through other chemicals policy programs and this Green Chemistry Initiative.

¹ Wilson, et al. *Green Chemistry in California: A Framework for Leadership in Chemicals Policy and Innovation*. California Policy Research Center: University of California. 2006.

In addition, while personal health concerns can motivate some consumers' purchasing behavior, many people are also concerned about buying products that contribute to ecological and environmental degradation. Toxic chemical pollution is on all lists of factors that are contributing to global environmental degradation today, and this degradation is not just a moral or ethical issue but one that affects people and their health: degradation of our oceans, lands and waters is threatening their ability to support life, both human and natural. When information about ecological and environmental impacts exists or emerges, it should also be made available to consumers.

The need for information about chemicals and products is a well-documented foundation for chemicals policy programs in general and was reiterated by stakeholder participants in the first phase of the Green Chemistry Initiative. Different chemicals policy approaches, however, will require various types and forms of information and will use the data in different ways. The amount of information that ultimately becomes available through California's Green Chemistry Initiative potentially could be quite large once the hurdles are overcome, and the data will likely need explanation, organization, protection and communication. Each of the three components of this key element will seek to address aspects of this challenge.

Marketing and Outreach

In the face of frequent product recalls and questions about the safety of ingredients in products, consumers are confused about which products are safe to use and how to distinguish safe products from those that could potentially pose a hazard. Many consumers mistakenly assume that control over the safety of products is more extensive than current authority allows, and that a product's presence on a store shelf indicates that it must be safe to use. Retailers and consumers need accurate, reliable and useful information about the ingredients in products to make informed choices.

At the same time, many companies are capitalizing on the general public's concern about product safety and interest in environmental impacts by promoting products as green, safe or wholesome. The public is frequently confused by these claims and some studies have found that many green claims are false or misleading, resulting in accusations of "greenwashing." Retailers and consumers need information resources that will provide consistent, systematic and meaningful definitions to compare and select green products.

Ultimately, as consumers and retailers realize the importance of greener, safer products, manufacturers will respond to changes in market demand and develop products or substitutes that are "benign by design." Yet manufacturers themselves may need additional information about the chemicals and other product ingredients to effectively improve products.

Information Technology

Although it is clear the Green Chemistry Initiative will need information and data to advance its goals, often the information and data required are either not available or are widely dispersed among a variety of sources. Further, because multiple international, national, federal and state agencies administer separate programs, each with its own distinct goals, the data that each collects and the ways that the data is organized may not be compatible or amenable to integration with other data sources. Although there

are numerous databases that currently contain chemical information the data is typically:

- not well organized or readily accessible;
- not compatible;
- limited to media-specific criteria;
- incomplete;
- not unique with regard to CAS# and/or name-indexing; and
- limited in its accessibility to full database content.

The information management system for this key element will need to address database limitations as well as the challenges associated with distributing information in a format useful to the public, retailers and manufacturers. Since information about product safety is typically not available to consumers, and is often not comprehensive or verifiable, new and expanded data collection efforts should include the following elements:

- An inventory of chemical production, distribution, applications and/or use;
- Collection of toxicity, persistence and bioaccumulation potential data;
- Data on types of, efficacy, life cycle and cost of alternative technologies.

Because the traditional approach to IT infrastructure development may not provide the flexibility needed to adapt and adjust to rapidly changing needs and demands, the information management system for the Green Chemistry Initiative will need to rely on creative applications of information technologies to communicate meaningful and reliable information.

Forging Strategic Partnerships

Although numerous international, national and state and local programs have pollution prevention programs in place to address green chemistry principles, many of these programs are not well-coordinated to address environmental issues on a broader scale. As a result, different governmental programs pursue like-minded projects with limited awareness of what others are doing.

California can leverage its position as the largest consumer market in the U.S. by entering into memoranda of understanding with the EU and Canada to share information about chemicals. Such information is already being or soon to be collected under the EU's REACH regulation and Canada's chemicals management plan developed under CEPA. California's participation would help harmonize these international efforts by expanding the information exchange and transparency of other programs, as well as adding data and information collected in California to the global information base.

With one of the top ten economies in the world, California can play a pivotal role in advancing an effective exchange of technology and information. Through partnerships with other international, national and state governments, California can establish an international and interstate clearinghouse of data on priority chemicals in commerce and safer and more sustainable alternatives.

Collaborative efforts to enhance information exchange among international, national, state, and local partners provides the groundwork and relationship building needed to facilitate and accelerate global dissemination of strategies to minimize the health impact

of chemicals used in consumer products. California's Green Chemistry Initiative must be crafted and implemented in the context of a global economy since many chemicals and consumer products that enter the state are manufactured in states or countries other than California.

International, national and state and local government policies play an important role in the development and implementation of environmental programs. To harness the collective knowledge of these entities and advance green chemistry principles California must lead the way through strategic relationships between international, national, federal, state and local governments and private organizations.

BACKGROUND

A number of existing programs both within the state and at the national and international levels can serve as examples for effectively communicating information to the general public through various methods.

Marketing and Outreach

Some existing state programs provide models for designing and structuring a marketing and outreach program for the Green Chemistry Initiative. California's Tobacco Control Program and the Flex Your Power program² are two examples of successful and effective ongoing consumer outreach and education campaigns administered by state agencies and public/private partnerships. Both programs incorporate multi-media campaigns, including providing detailed information through information technology services, to convey a clear, focused message and achieve specific outcomes. Additionally, the California Tobacco Control Program includes a robust community education program which includes funding to local health departments and community-based organizations that facilitate development of local policies that support the Program's overall goals to de-normalize tobacco use.

Beginning in 2008, the "Spare the Air Campaign," the program known for providing air quality alerts in the summertime, will expand its program to emphasize healthier lifestyles year-round. The new focus of the program will motivate the public to consider everyday actions that can improve air quality, not just those taken during the summer when air quality is at its worst. The goal associated with this effort is likely to be similar to the goals of the Green Chemistry Initiative.

Other existing state programs focus on protecting consumers from certain dangerous products and include elements that provide consumer information. For example, although the Proposition 65 warning is not necessarily specific, it does alert consumers to potential carcinogens and reproductive toxicants in products. Similarly, pesticides used in California must contain specific use information and warnings on its packaging, which helps provide consumer information. Experience from these programs can help to inform techniques for providing consumer information.

² See <http://www.fypower.org> and <http://ww2.cdph.ca.gov/programs/Tobacco/Pages/default.aspx>

Information Technology

Multiple international, national, federal and state agencies administer programs that collect chemical data and information to protect consumers from exposure to hazardous products and/or pollution. These information sources are examples of the types of existing data that may be considered useful to a decentralized database. A partial list of these includes:

- Health-related chemical data - The California Department of Public Health (DPH) collects or monitors certain chemical data and human health information for various health-related programs, including childhood lead, occupational health, indoor air, and other programs.
- Pesticide data - The California Department of Pesticide Regulation (DPR) maintains the most extensive pesticide use reporting system in the United States. Recent data show a decline in the use of high-toxicity pesticides.
- Cancer and reproductive harm chemical data - The Office of Environmental Health Hazard Assessment (OEHHA) administers the Proposition 65 program and maintains data used in reviewing chemicals for possible listing as known to cause cancer or reproductive harm.
- Public health goals for drinking water contaminants: OEHHA develops health-protective values known as "public health goals" that are used by DPH in setting primary drinking water standards, or maximum contaminant levels.
- Child-specific reference doses for contaminants at school sites: OEHHA develops numeric health guidance values for contaminants commonly found at school sites, intended for use in the assessment of risk at proposed or existing school sites. Currently, OEHHA focuses its evaluation on non-cancer effects.
- Toxicity criteria database: OEHHA maintains a database of cancer potency values, acute and chronic exposure levels, and other toxicity values.
- Fish advisory chemical data - OEHHA issues site-specific fish consumption guidelines for sports fish in California, based on its assessment of the health effects associated with contaminant levels found in the fish.
- Water and sediment quality chemical data - The State Water Resources Control Board (SWRCB) and the nine Regional Water Quality Control Boards collect discharge and receiving water data to assess water quality and sediment quality.
- Air quality and toxic air contaminants data - The State Air Resources Board (ARB), along with the local air districts, gathers chemical concentration data for ambient air and emissions for certain criteria air pollutant and toxic air contaminant chemicals. OEHHA conducts health risk assessments of air contaminants.
- Bio-monitoring chemical data - A multi-agency program (DPH, DTSC, and OEHHA) that is being initiated to identify and track data on chemicals of concern in humans,
- Hazardous waste data - Pursuant to the *Hazardous Waste Source Reduction and Management Review Act of 1989* DTSC collects data on hazardous waste generation, transportation, treatment and disposal.
- Pollution prevention chemical data - Local governments are beginning to collect data on green business and pollution prevention programs. The data will measure the progress of small businesses in reducing waste.

In addition to the state databases numerous international, national, and federal databases exist or are under development. Although not an exhaustive list, these include:

- OECD HPV – The Organization for Economic Cooperation and Development is developing and making accessible screening-level hazard data and initial assessments on high production volume (HPV) chemicals. The work is being carried out by both member countries and individual companies or consortia organized through the International Council of Chemical Associations (ICCA).
- US HPV - The U.S. high production volume (HPV) chemicals are those which are manufactured in or imported into the United States at levels \geq one million pounds per year. The U.S. HPV Challenge, launched in 1998 as a companion to the OECD program, is developing screening-level information on chemicals produced at the HPV level in the U.S. EPA is also beginning to assess data developed under the program.
- CEPA - The Canadian government, through the 1999 amendments to its Canadian Environmental Protection Act, used existing information to categorize chemicals in its national inventory, identifying more than 4,000 chemicals that possessed hazard or exposure characteristics of potential concern. Further assessments of these chemicals are now underway, focused on about 200 high-priority chemicals for which the government has mandated the submission by manufacturers and importers of information on their production and uses.
- EU REACH – This new regulation, Registration, Evaluation, Authorization and Restriction of Chemicals (REACH) went into effect on 1 June 2007. The aim of REACH is to improve the protection of human health and the environment through better and earlier identification of the intrinsic hazards of chemical substances, while enhancing the innovative capability and competitiveness of the EU chemicals industry. For chemicals already in commerce, REACH's provisions will be phased-in over 11 years. Most information developed under REACH will be made publicly available.
- E-Chem Portal – The eChemPortal offers free public access to information on properties of chemicals; and allows for simultaneous search of multiple databases. The eChemPortal gives access to data submitted to government chemical review programs at national, regional, and international levels. Users can search multiple sources of information simultaneously using a chemical substance name or CAS Registry Number and obtain direct links to the retrieved data within each site.
- TOXNET – An online searchable cluster of databases maintained by the National Library of Medicine and covering toxicology, hazardous chemicals, environmental health and related areas, including the Hazardous Substances Data Bank (HSDB) and U.S. EPA's Integrated Risk Information System (IRIS)
- HSDB - A factual database focusing on the toxicology of over 5,000 potentially hazardous chemicals. In addition to toxicity data, HSDB provides information in the areas of emergency handling procedures, industrial hygiene, environmental fate, human exposure, detection methods, and regulatory requirements. The data are fully referenced and peer-reviewed by a Scientific Review Panel composed of expert scientists.
- IRIS - A database from the U.S. Environmental Protection Agency (U.S. EPA) containing carcinogenic and non-carcinogenic health risk information on over 500

chemicals. IRIS risk assessment data has been scientifically reviewed by EPA scientists and represents EPA consensus

Forging Strategic Partnerships

Both Canada and the EU are undertaking information development programs that are much broader than those undertaken to date in the US, and will generate considerable information on many chemicals that are likely to be produced in, imported into, and used in California. Access to such information will be extremely useful to the State in understanding actual and potential uses and risks of chemicals that enter and are used in California, and in setting priorities for activities to be undertaken pursuant to the Green Chemistry Initiative. During the first phase of the Green Chemistry Initiative, representatives of these programs and other experts regarding their implementation delivered presentations at the green chemistry workshops and these contacts with California will help facilitate our international relationships.

Brief descriptions of these two programs follow.

Canada's Chemicals Management Plan

The Canadian Environmental Protection Act (CEPA 1999) required that every chemical substance made in Canada or imported from other countries be assessed using existing information against specific criteria to identify those posing high hazard or exposure potential. In 2006, Canada completed the major task of systematically sorting through the approximately 23,000 existing substances that had not been previously assessed. This exercise was called "categorization." Categorization was the first step in determining which of these chemical substances required further assessment, testing and/or measures to control their use or release. This effort was divided between Environment Canada and Health Canada.

Based on existing data and modeling, Canada identified 4,300 substances meeting the categorization criteria. These were further prioritized into high, medium and low priority groups. For roughly 200 of the top 500 chemical substances that were found to pose the greatest potential to harm human health or the environment, Canada has stated its intention to impose controls over their production or use, and has begun a process to challenge industry to provide additional information that might later that conclusion. The challenges are being published in batches of 15-30 substances. Where risk assessments of these chemicals indicate they meet the "CEPA-toxic" criteria, the government intends to impose appropriate risk management measures.

Registration, Evaluation, Authorization, and Restriction of Chemical Substances (REACH)

REACH is the European Community's regulation for chemicals and their use. REACH gives greater responsibility to industry to identify and manage the risks from chemicals they produce and use, and to provide safety information for the substances. Manufacturers and importers of a chemical in amounts of one metric ton or more are required to register the chemical with the newly established European Chemicals Agency (ECHA), identify and assess all of its uses, and provide safety information to any downstream users. ECHA will make non-confidential information available to the public. ECHA or public agencies in the EU's member countries can substances of very high concern, and require that they be subject to use-specific authorization. Use authorization will be granted only if any risks are demonstrated to be adequately controlled or, for chemicals for which such a showing cannot be made, if social/economic benefits are shown to outweigh the risks and there are no suitable substitutes. The burden of proof in such cases is on the applicant for authorization, not the government.

THE OPPORTUNITY

Sharing, organizing and managing information to benefit the public, retailers, manufacturers and other governmental entities are activities that the state can initiate using existing authorities. Making outreach and information management a cornerstone of the Green Chemistry Initiative will help lay the groundwork for and enhance implementation of framework activities.

Marketing and Outreach

Because a marketing and outreach campaign primarily informs and typically does not impose mandates or requirements, it does not need specific statutory or regulatory authority. It represents an opportunity to leverage existing resources to provide a highly visible and clearly useful program for a variety of audiences, ultimately benefiting the overall goals of the Green Chemistry Initiative, from the strength of the consumer base, resonating up through a product's supply and production chain. However, based on the experiences of the Tobacco Control Program and the Flex Your Power program, an effective campaign requires clear messages related to the goals of the program, additional information resources to augment the program's message, and a budgetary commitment commensurate with the campaign's media focus.

In the very near term Cal/EPA can introduce a Green Chemistry Retailers and Consumer Marketing and Outreach program containing information to be determine during the implementation phase using current outreach approaches, such as press releases, workshops and existing websites and new website links. Many of the essential considerations for a marketing and outreach plan can be addressed through existing infrastructure.

Information Technology

Although the boards, departments and organizations within Cal/EPA currently work towards more collaborative environmental solutions, many of the existing IT resources are managed independently, creating multiple discrete databases with multiple fields

that are not necessarily designed with the intention of being compatible with others. The goal of this aspect of the key element is to align IT services and organization to gather and disseminate the information needed by consumers, retailers and manufacturers.

Further, databases maintained by U.S. EPA, the European Union, Canada and others are not always compatible with each other and may not address all of the data needs requested by the stakeholders or identified by agencies. This aspect of the key element requires further planning integrated with the business needs of each BDO to establish the protocols needed to collect the data and provide a foundation for the framework elements.

Because many uncertainties regarding the needs for a comprehensive information management system remain, options for maximizing public/private partnerships and optimizing the IT infrastructure of Cal/EPA and its BDOs' will be developed and considered as the information needs are further refined. Cal/EPA and its BDOs can establish a task force to evaluate programs and capabilities, especially information management and technology activities related to the Green Chemistry Initiative. During this evaluation phase, serious consideration should be given to using an iterative IT design process rather than the traditional process used in state government since the rapidly evolving field of green chemistry requires a more flexible adaptive process.

The task force will also be asked to devise strategies to ensure that long-term data collection efforts will access all readily available sources. The task force would consist of representatives from each of the BDOs that will be involved in the planning and identification of the most suitable IT infrastructure as well as identifying and refining data collection needs simultaneously. Because of the uncertainties in identifying all actual needs until the work has progressed to a strategic point, this aspect of the key element proposes to use the existing IT infrastructure within Cal/EPA and its BDOs to both refine the business needs in advancing the green chemistry principles, and solicit further input on the final framework.

In addition, partnerships with private organizations and industry to make web-based information available may advance green chemistry goals and objectives by increasing the accessibility of this information.

At a minimum, in the short-term, each BDO has the capacity to:

- Verify existing information regarding programs and human and IT resources within its jurisdiction, as well as authorities that are related to or that can be linked to green chemistry efforts.
- Provide web links on their websites directing stakeholders to other websites for additional information on chemical hazards.
- Prepare and make available fact sheets that address stakeholder needs related to green chemistry.
- Prepare focused surveys soliciting input on usefulness of existing databases and other data needs.
- Include a "Wiki"-type forum within Cal/EPA and its BDOs to maximize the ability of collecting information. Because volunteers can contribute to the content on the Wikipedia, measures would need to be put in place to advise users. The data

that is compiled could include chemicals in commerce, their uses, and toxicity, and emerging green chemistry technologies.

- Use on-line general interest notification devices, such as Craigslist, to distribute public notices, solicit input on surveys, and inform the public of on going developments in Green Chemistry. On-line classifieds and forum sites are widely accessible and can notify millions of people efficiently and economically.
- Enter a partnership with Google, similar to the partnerships between Google and top universities, to scan and digitize select collections and information to make it publicly available and searchable. Google is a leader in providing the public with access to billions of web pages through a search engine that processes requests in less than half a second, and responds to more than 150 million search queries per day. Google and the University of California have entered into such an agreement because of their mutual interest in making information available to the public. An agreement between the BDOs and Google would specify the standards and automated methods for organizing and indexing web-based and digitized work, and would refine standard requirements for repositories of digital content.

Some advantages associated with the listed options include:

- Modifying existing web links on each BDO's website requires minimal effort for a potentially large impact.
- Would not have to purchase, develop or maintain a database system.
- Allows BDOs the opportunity to inventory green chemistry resources and gauge the needs of stakeholders.
- Allows for thorough evaluation of each BDO's database systems for compatibility with others.
- Refines business needs.

In the short-term, re-aligning and re-directing existing BDO resources would allow the Green Chemistry Initiative to begin implementing many aspects of a consumer marketing and outreach program such as:

- Conduct consumer opinion research and surveys.
- Research key issues and chemicals of concern.
- Identify goals, outcomes and the essential message to convey.
- Identify, gather and define information resources for consumers.
- Develop a process to evaluate program impacts and refine implementation

In addition the realignment and redirection of existing BDO resources would provide the following advantages:

- Minimal and absorbable to modify existing web links on each BDO's website.
- Would not have to purchase, develop or maintain a database system.
- Allows BDOs opportunity to inventory GC resources and gauge the needs of stakeholders.
- Allows for thorough evaluation of each BDO's data base systems for compatibility with others.
- Refinement of business needs.

For example, BDOs can form partnerships within Cal/EPA, with other state agencies and with other stakeholders to maximize efficiency, expertise, available information and existing resources. In this way data needs can be refined to better serve the needs of all stakeholders. Long term goals for the IT infrastructure may include:

- Web based Clearinghouse to collect, store and disseminate chemical data
- Exposure simulation models
- Expanded Toxicity data
- Technical Assistance/ Substitution Clearinghouse
- Life cycle analysis/ carbon foot print
- Iterative Data Updates
- Access to web-based training

Forging Strategic Partnerships

To harness the collective knowledge at the international, national and state level California could enter into memoranda of understanding or other cooperative agreements with international, national, state and local governments, or with private organizations. Under these agreements, governments and organizations will agree to work collaboratively to develop policies that would leverage existing knowledge and share data. Such collaboration could establish data gap priorities where information on chemical properties, toxicity, and information that is not publicly available or data claimed as confidential business information could be exchanged.

By negotiating Memoranda of Understanding with the European Union and Canada, California will gain access to chemical information being submitted to those governments that would be germane to advancing the Green Chemistry Initiative. In recent years, both governments have undertaken or initiated efforts to significantly expand the scope and amount of information on industrial chemicals to be developed and submitted by companies that produce and use such chemicals, a portion of which is expected to be designated by the submitter as confidential business information (CBI).

The Canadian Environmental Protection Act (CEPA) and the EU's REACH Regulation contain specific provisions for agreements to be reached that allow CBI obtained under those authorities to be shared with other governments. The requirements for such agreements require that the recipient governments have in place mechanisms to ensure that such information remains confidential, and that it is intended for use in administration or enforcement of that government's legal obligations and authorities under relevant law, and/or cooperation on implementation or management of legislation governing industrial chemicals. (Section 316 of CEPA and Article 120 of REACH)

Because companies typically claim CBI status for information relating to how chemicals are used – which is important to understanding the potential for releases of and exposure to those chemicals – gaining access to CBI information submitted under the EU and Canadian programs will help to advance the goals of identifying both chemicals of concern and potentially safer alternatives.

More generally, gaining access to all available information that will already be organized within the sophisticated relational database being developed by the EU for its REACH program will give the state an opportunity to build upon the work already done by the EU and Canada. The ability of the state to use such information and to share the non-

confidential portion of it with stakeholders will be greatly facilitated if portions of “reinventing the wheel” can be avoided.

IMPLEMENTATION PLAN

The effort to communicate information about chemicals and products to empower consumers to make informed choices may best be undertaken in phases since certain critical steps, such as characterizing the target audiences, lay the foundation for following activities, such as surveys and outreach.

Major strategies (actions)

Marketing and Outreach

The goals, outcomes and messages conveyed are the essential elements for a successful consumer marketing and outreach program. The desired outcome of a consumer outreach or education campaign is to change consumer behavior or community norms. One of the goals of this key element is to increase consumer awareness and knowledge regarding chemicals and products. A proposed marketing and outreach campaign, modeled after other state information campaigns would include the following steps and considerations:

Step One: Define clear objectives and desired outcomes

- Identify short-term objectives and outcomes
- Identify long-term objectives and outcomes

Step Two: Develop strategies based on valid and agreed assumptions

- The need for outreach and priorities
- The action (e.g., supply side or demand (consumer) side)
- Public’s attention (existing and necessary)
- Need to educate
- Public opinion, concerns, motivations etc.
- The “teachable moments” (e.g., when in the market to purchase?)

Step Three: Characterize the four T’s and identify resources

- Targeting
 - Each audience is different, programs, measures, messages should be targeted. For instance, communicate differently to businesses than general public.
 - Target the market segments campaign intends to reach: commercial, industrial, government (all levels), agriculture, residential, etc.
 - Target the best messengers to reach each audience
 - Target best communications channels to reach each (TV, industry leaders, targeted events, etc.)
- Tools
 - There is no single best approach - government should use all the tools at its disposal, and coordinate them.
 - Examples of the tools government has, and each benefits from good communications:

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- Mandates
- Prohibitions
- Incentives
- Disincentives
- Public Education
- Technical assistance
- Public/private partnerships
- Investments
- Timing
 - Marketing campaigns have a rhythm, a progression.
 - Early messages...building to later messages, etc.
 - Perhaps start with education, incentives...then move to more mandates and prohibitions as they are developed.
- Tone (messages and delivery)
 - Warning/crisis/danger?
 - Educational in nature?
 - Social marketing techniques?
 - Government here to help, or a “people’s” campaign?
- Budget
 - Comprehensive campaign needs the objectives and information in place (which chemicals, etc.)...probably down the line. Comprehensive budget is expensive in a state as big as California (e.g., broadcast communications to reach the general public.)
 - Prioritize and phase campaign based on best use of available budget

Target Audiences:

Because retailers and consumers are a heterogeneous mix of individuals from the “advocates” who demand action at one extreme to the uninterested at the other extreme, the desired outcomes of the marketing and outreach efforts should reflect the intended changes in behavior in a given segment. For instance, for the “disinterested,” a desired outcome would be to raise awareness about the issue of product safety/greenness. For the “aware,” the desired change would be to provide them with clear, easily accessible information that’s useful in making buying choices. For the “concerned,” we want to provide them with information that would mobilize them to take action to demand safer, greener products. As an extension the key element should also define “consumer” broadly, based on sectors such as commercial, industrial, governmental, agricultural and residential and define desired outcomes of an outreach effort to each of these segments.

Consumer		Desired Outcome and Message
Residential	Disinterested	Raise awareness about product safety – media campaign
	Aware	Clear info for making buying choices – website info
	Concerned	Mobilize action to demand safer choices – agency assistance
Commercial		What’s hazardous and why
Industrial		What do consumers want
Agricultural		
Governmental		Environmentally preferred purchasing

Since the outreach message must be tailored both to the desired outcome and target audience, target audiences must be carefully defined before the messages can be formulated. As this key element is implemented, the key element implementation team should select one or two sectors to characterize and develop outcomes, messages and methods for measuring success.

Content, Messages and Informational resources:

The information that can and should be communicated varies with the sector and target audience and will need to be determined as part of this key element. The key element team identified the following questions as potential concerns for most residential consumers:

- What harmful chemicals are present in everyday household goods?
- What is a benchmark or standard for identifying what's good/safe?
- What do the label terminology or confusing green marketing terms mean?

Because this key element focuses on using existing available information as much as possible at the outset of this information campaign, the key element implementation team will identify the sources of available information and the consumer sectors that will benefit from them. A number of existing information sources include product lists compiled by credible groups include City of San Francisco and Environmental Defense; others will be identified as part of the implementation of this key element. As mentioned earlier, some consumer sectors will need technical chemical information to be interpreted and made accessible. The key element implementation team will need to determine the types of information best suited for each of the consumer sectors and the best methods for delivering this information. The key element team identified some methods for effectively communicating information to certain consumer sectors:

- Broadcast media campaign – residential consumers, disinterested and aware
- Product labels – all consumers except disinterested residential consumers
- Website and phone line - all consumers except disinterested residential consumers
- Government interventions - all consumers except disinterested residential consumers

To be effective the message and its method of distribution must be designed to engage the target audience and move them from knowledge to action. Again, these will depend upon the targeted consumer sector and desired outcomes. The key element team identified several key issues that must be considered as part of the outreach message:

- Frame issues around personal health effects & impacts to children in addition to long-range environmental or economic impacts
- Focus on alternatives as part of the message
- Identify top priority issues/chemicals, such as a “Dirty Dozen” approach
- Deliver bad news first, then follow up with positive actions the consumer can take
- Where possible, identify chemicals with positive attributes; ingredients with health benefits

Methods

Some of the strategies for accomplishing the steps in the proposed outreach and marketing plan include the following:

- Stakeholder input – solicit and obtain input from 3rd parties, other agencies with consumer outreach campaign experience, NGOs with residential consumer emphasis and other interested stakeholders, to help characterize and prioritize the following:
 - Short- and long-term objectives and outcomes
 - Assumptions for the outreach program
 - Consumer sectors, and needed information
 - Target audiences and appropriate and suitable messages
- Consumer survey – using stakeholder input regarding target audiences and other research, conduct consumer and business surveys to help define the following:
 - content of the outreach campaign
 - types and forms of informational resources to make available
 - baseline conditions to gauge and monitor public opinion before the outreach program begins
- Communication and outreach evaluation – using stakeholder input, agency experience and other research, identify and evaluate mechanisms for disseminating information (focus particular attention on mechanisms that can be implemented effectively with limited resources), including:
 - media campaigns: TV and radio, billboards, print, toll-free number)
 - IT and internet/online approaches
 - substantive public relations events
 - ongoing/continuous mechanisms
- Monitoring and feedback mechanisms – develop methods to measure progress and success of outreach approaches, including:
 - Consumer behavior and purchasing data
 - follow-up surveys to compare to baseline conditions

Information Technology

The strategy for planning and developing an information management system will reflect stakeholders' and governments' needs, vision, mission, and values. A chief Information Officer will convene the appropriate level of technical and programming staff to develop the most suitable alternatives in the interim and as a final product.

A report or summary identifying the strategic objectives, performance measures and targets will be developed and provided for review by stakeholders.

At a minimum the summary or report will contain the following.

- Relationship to overall strategy
 - Evaluation of alternatives to address the strategic needs; vision and mission of stakeholders.
 - Centralized Database System
 - Decentralized Web-based System
- Resource summary
 - Summary of resources dedicated to green chemistry/pollution prevention programs in the state
 - Staffing
 - Budget

- Summary of key business needs
- Internal capabilities
- External capabilities
 - Partnerships
- IT portfolio management - An inventory of current international National, federal state and local databases related to Green Chemistry.
 - Identification of compatibility between the databases contained in the inventory.
 - Identification of strengths and weaknesses of databases in the inventory.
- Identification of Internal and External stakeholders
 - Summary of needs driven by all stakeholders
 - Expectations of all users
- Threats
 - Description of disruptive forces that could cause the organization to become less functional
- Organizational structure and Governance
 - Organization roles and responsibilities
 - IT role description /Governance
- Milestones
 - List of monthly, quarterly or mid-year milestones and review dates to indicate if the strategy is on track
 - List milestone name, deliverables and metrics.

Audience

A technology strategy document must be designed to be read by non-technical stakeholders involved in the planning and organization of advancing green chemistry. To the extent practical the summary should be free of technical jargon and information technology acronyms.

The IT strategy should also be presented to or read by other internal IT staff members. Many organizations circulate prior year versions to internal IT staff members for feedback before new annual IT strategy plans are created.

Forging Strategic Partnerships

The approach for developing strategic relationships with international, national, state and private organizations will require direct communication with key contacts, participation in roundtables and one-on-one meetings.

Major milestones (timeline)

Marketing and Outreach

The overall time line will be governed by the other key elements, overall framework and Cal/EPAs BDOs business needs. In the near term this key element should be implemented in phases, beginning with stakeholder input to resolve the list of considerations. Given the uncertainty regarding available resources, the initial phases should also include those research, survey and communication elements that are less resource-intensive.

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<i>Consumer Outreach - Activity</i>	<i>Timeframe</i>
Reconvene task force (external) - refine goals & objectives of key element - finalize priorities (& associated criteria)	1 month
Establish executive steering committee (internal) - responsible for expediting decisions & contract issues	1 month
Develop approach to collect stakeholder input - develop comprehensive list of stakeholders and outreach efforts to ensure stakeholders have been reached - workshops - online surveys & message boards	ongoing
Develop a detailed plan and system to evaluate the consumer outreach key element to include the following: - develop list of key outcomes and indicators to evaluate the key element - prepare evaluation procurements (or enter into Interagency Agreement with universities) for telephone survey, observational retail survey, scanner data - award evaluation contracts - design baseline and follow-up survey instruments and protocols	2-3 months for planning; 6 months to prepare and award contracts
Develop a detailed plan to determine target audiences: - identify consumers, producers, etc - characterize audiences (demographics, location, opinions, special language needs, environmental justice concerns, etc) - consider how consumer information (at all levels of the supply chain) can be improved (could potentially lead to packaging regs)	3-6 months
Develop a detailed plan to determine appropriate messages for the target audiences: - identify interests and concerns - focus on specialized messages for environmental justice communities & non-native English-speaking communities - identify & prioritize information needs – focus on info needed to make informed consumer and production decisions - identify “green” manufacturers, products, approaches – also develop criteria to determine this	3-6 months
Design and develop an ongoing consumer awareness and information campaign to include the following: - review literature and studies on the relative effectiveness of various forms of media among specific target populations - identify and evaluate potential methods for delivering intended messages – include cost-effectiveness estimates - identify specialized methods to reach “under-served” communities (lower income consumers, non-native English-speakers, environmental justice communities) - prioritize methods - conceptualize and release consumer awareness media campaign procurement - award consumer media campaign contract	6-12 months
Launch consumer media campaign	3-6 months
Develop ongoing internal/external communication plan to keep upper mgt., internal and external stakeholders informed of implementation	1 month
Conduct baseline & consumer and retail observational Survey(s) - evaluate & interpret results - determine effectiveness of implemented options - provide feedback to consumer outreach plan & system	3-6 months
Develop policy tracking database	2-3 months
Develop resulting policy efforts: - identify rulemaking opportunities - develop proposals for implementing policies	ongoing

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<ul style="list-style-type: none"> - create on-line source (blog) for dialog and information - assess impact studies - develop a systematic approach for identifying components in products without violating confidential business information requirements (typically federal) 	
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Information Technology

The IT key element requires planning that is integrated with all of the business needs identified in the GCI and those identified by each BDO. This can only be accomplished by establishing a working task force that will reconvene at strategic points to refine the needs and design the final system. This key element will be completed in phases as follows:

<i>Information Technology - Activity</i>	<i>Timeframe</i>
Reconvene Task Force	July 2008
Develop a detailed plan and approach for identifying and evaluating IT needs and approaches	July 2008 - Aug. 2008
Identify inventories to help focus consumer outreach milestones <ul style="list-style-type: none"> - inventory of current labeling requirements that may exist (packaging requirements) - inventory of different purchase decisions - information needed to make purchase decisions (potentially from consumer surveys) - inventory of information available - compiled health warnings (related to goals & objectives) 	July 2008 - Aug. 2008
Analysis of IT needs and approaches: <ul style="list-style-type: none"> - develop criteria for evaluating databases – consider factors such as relevance, user-friendliness - develop methods for improving usefulness of databases - identify new databases & info needed to fill data gaps 	Sep 2008 - Oct.2008
Recommendations and design for IT information – specific strategies may include: <ul style="list-style-type: none"> - identify methods for placing green chemistry messages on desktops, such as RSS feeds, partnerships with news websites, podcasts, listservs, blogs, etc - centralize databases identified as relevant & useful through web-linkages - include links to websites that encourage sustainable practices, such as the DPR School Integrated Pest Management (IPM) Website and the UC IPM Website 	Nov 2008 – Dec 2008

Forging Strategic Partnerships

The overall strategic partnerships are crucial in harnessing collective knowledge to avoid duplication of efforts. The task force will be responsible for convening and having agreements in place.

<i>Strategic Partnerships - Activity</i>	<i>Timeframe</i>
Develop a detailed plan and approach for establishing international and national contacts: <ul style="list-style-type: none"> - research existing MOUs with Canada and the EU - maintain contacts already made with Environment Canada - determine what information used by Health Canada that is not publicly available is needed - continue to work with UC Berkeley, NGOs, others to develop contact in EU 	July 2008 - Aug. 2008
Identify CBI (confidential business information) limitations and methods for resolving potential issues	

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- research California's relevant CBI rules and identify needed modifications - research EU and Canada CBI requirements and identify conditions that must be met to obtain this information and assess whether California, as a state would be eligible to obtain CBI data	
Identify information needs including specific data, background information, and developmental/decision criteria - research available information to determine specific data needs not made publicly available	
Develop draft international agreements - depending on the EU requirements on sharing confidential business information with a State	Sep 2008 - Oct.2008
Finalize agreements	Nov 2008 – Dec 2008

Linkage to overall framework

Because this key element centers around the tasks of gathering and communicating information in support of sustainable decisionmaking, it is essential to any comprehensive effort to transition the consumers, retailers and manufacturers of California toward a “Cradle to Cradle” framework. Collectively, the three aspects of this key element incorporate the planning and communication that must take place to achieve the overall green chemistry goal of encouraging innovation, use and manufacture of safer more environmentally benign products and processes. Much of the success of green chemistry will hinge on an effective consumer outreach effort and on the collection and presentation of useful information about chemicals and products to everyone likely to use them, from the general public to product designers, and everyone in between.

Outreach and marketing is needed to raise awareness and impart enough valuable information about products and chemicals to enable everyone, including those who make, sell and purchase those items, to make more informed decisions. In addition to learning about products and their ingredients, the public needs to know why green chemistry is important and how it can seamlessly provide safer, more sustainable products along with a safer, more sustainable world.

Information management and technology development is needed to help manage the information gathered about products and chemicals, and make it available to the widest possible audience in a form that benefits the user . In particular, it helps make information readily accessible to stakeholders and as a result helps to protect consumers and the environment. It also helps to provide a means to more easily identify information gaps and hence to prioritize the need to address such gaps.

Forging strategic partnerships is needed to exchange information with other green chemistry partners and governments to maximize the amount and effectiveness of information available. Because the EU and Canada are the international communities with the most promising and potentially useful information, they will be the primary focus of international partnerships early on. However, as other international, national and state programs begin to take shape and indicate a willingness to collect and share data, this component can be expanded to include relationships with U.S. EPA, other states and other international communities.

Resource considerations

For an outreach and marketing campaign, much of the scoping, development and implementation planning can occur as collaborative efforts among Cal/EPA BDOs using existing resources, given the expertise of some agencies with outreach and surveying activities. In addition some aspects of information dissemination, especially through existing internal and external IT infrastructure such as the use of innovative notification approaches, are likely to consume minimal resources. Similarly, the meetings and negotiation required to establish information-sharing partnerships can occur using existing resources.

Depending on the size, extent, design and intended outcome of consumer surveys, costs can vary widely from \$50,000 for telephone surveys of around 2,000 individuals to nearly two million dollars for surveys of 28,000 households. Similarly, the costs associated with an outreach campaign depend largely upon the media outlets used and the format, design, and intended outcomes and messages of the campaign. A sixty second radio ad that is aired once may cost \$150.00, whereas a more comprehensive broadcast media campaign that includes creative development, production costs, placement costs and air-time, such as tobacco media campaigns, can range from \$12 to over \$20 million.

The cost to evaluate, summarize and recommend final information management alternatives, such as decentralized database system or centralized clearinghouse can be accomplished with existing funding levels. However, the resources required to develop the infrastructure to upload information from various data sources is not known and will need to be determined during scoping and evaluation. California can pursue collaborative partnerships to augment existing resources and avoid duplication of effort.

Institutional structure

The implementation of this key element will require a variety of expertise, particularly in the areas of marketing and outreach, and in organizing and presenting information management, presentation and technology options. The key element would benefit from collaboration with participants from public and private entities with prior experience and innovative ideas, especially for outreach and IT implementation.

It is anticipated that a number of the functions associated with the three aspects of this key element may be stimulated by governmental activities, but the implementation and activities may be most effectively conducted by private entities or non-governmental organizations (NGOs) with support from state agencies, or vice versa. For example, a decentralized database of chemicals and products could be maintained by an NGO or non-profit organization with financial support from the state, or the state could host such a database with technical assistance and support from private IT consultants. Similarly, the state may develop the objectives and requirements for a marketing and outreach campaign, which an NGO or non-profit could subsequently implement, or the state could implement an outreach campaign and help private organizations to measure the success of the outcome and respond to changes in product demands.

The structure of these aspects of this key element can, and likely will, be flexible, reflecting the detailed development of the tasks associated with phases and components of the elements.

Metrics

The overarching goal of the three aspects of the key element addressed in this report is to facilitate demand in the marketplace for greener products as a result of increased awareness and knowledge regarding the safety and toxicity of various chemicals used in consumer products. Given the cutting-edge nature of the Green Chemistry Initiative and the broad goal of designing products and processes to reduce or, ideally, eliminate substances hazardous to human health and the environment, it is important to evaluate and demonstrate the impact of the program and to sustain the program and facilitate its replication by other states and countries.

While a traditional randomized control study is not feasible, an evaluation can be designed to measure the impact of the Initiative and assure accountability for the use of public resources. However, attribution of changes in consumer attitudes, knowledge, and behaviors and ultimately changes to consumer product labeling or composition to the Green Chemistry Initiative will be challenging. Manufacturers and large retailers are already capitalizing on consumer interest in green products and filling the media environment with their own green-focused messages. The evaluation will have to be carefully planned and executed to separate the impact of the Green Chemistry Initiative.

Key to designing an appropriate evaluation will be development of key outcome indicators that are specific, observable, and measurable characteristics or changes that represent achievement of an outcome. For example, if a key outcome of the California Green Chemistry Initiative is, "increased knowledge of and preference for green products, and increased support for policies that promote the manufacturing, sale, and labeling of green products," then the following are examples of indicators that the evaluation might measure:

- Level of confirmed awareness of California Green Chemistry Initiative media messages.
- Level of receptivity towards green chemistry messages
- Proportion of the population that perceives the use of specific products in consumer products as harmful
- Attitudes about purchasing preference for consumer products that are lower in toxicity
- The proportion of household cleaning products within grocery stores labeled as to their safety and toxicity
- Proportion of window cleaning products sold that are considered low in toxicity
- Proportion of state and local governmental agencies that adopt policies that require the purchase of green products

The goal of the Green Chemistry Initiative is to lead producers and consumers in the state to the design, manufacture and use of products and processes that will reduce or even eliminate substances that are hazardous to human health and the environment. Given the broad goals, it is important that the metrics developed to assess and demonstrate the impact of the Initiative focus on the specific efforts that advance green chemistry. In addition, the metrics will help support new investments to sustain the green chemistry initiative and help expand its impacts beyond the borders of California to other states and countries.

Potential metrics include:

- Increase in awareness of green chemistry principles by consumers by 50% by 2010.
- Reduction in the purchase of consumer goods with hazardous substances by 25% by 2010.
- Close the information/data gap by 25% by 2015.
- International data-sharing agreements by ?

Methods used to evaluate the Initiative will include: 1) consumer surveys to assess the reach and impact of the consumer outreach campaign and its impact on attitudes, knowledge, intentions to change behaviors, and behavior change; 2) tracking consumer purchasing data; 3) store observation surveys, and 4) monitoring public policies at the state and local level related to green chemistry. The approach includes a process for evaluating program impacts and using the evaluation to refine the program implementation. Ideally, evaluation, tracking, and monitoring efforts will collect and analyze data in a manner that allows the program evaluation to attribute changes in consumer behavior and other outcomes to the efforts of the Green Chemistry Initiative.

RECOMMENDATIONS

To successfully disseminate information about chemicals in products and empower consumers to make informed choices the key element team recommends that California concurrently pursue the following activities:

- Design and implement an outreach, marketing and communication plan:
 - Determine the intended message(s), the target audience(s), the receptivity of the audience, and the information to be communicated
 - Identify and evaluate method(s) to deliver product and chemicals information
 - Monitor the results of the outreach campaign and make necessary adjustments
 - Convene an outreach team to advise design and implementation
- Facilitate an information management and technology infrastructure for chemicals and product information:
 - Determine types, amount and quality of available information and identify and evaluate data translation needs and options
 - Evaluate, summarize and recommend the best alternatives for managing chemical information and making it accessible to stakeholders
 - Establish contacts and begin discussions with potential public and private information management and technology partners, such as Google
 - Convene an information task force to advise on development, evaluation and implementation of available options
- Form strategic relationships with international, national, and state and local governments and private organizations to advance green chemistry:
 - Establish contacts with and open negotiations for MOU-type agreements with Canada, the EU, Massachusetts, Maine and other western states to share product and chemical information