



CALIFORNIA DEPARTMENT OF TOXIC SUBSTANCES CONTROL

---

# Status Report on the Implementation of the Green Chemistry Initiative

June 2009

## I. OVERVIEW

This status report is to provide an update summarizing the efforts of the Department of Toxic Substances Control (DTSC) to implement the Green Chemistry Initiative. The California Green Chemistry Initiative Final Report released in December 2008 included six policy recommendations for implementing this comprehensive program. Pursuing these landmark policy recommendations would continue California's environmental leadership and foster a new era in the design of a new consumer products economy – inventing, manufacturing and using toxic-free, sustainable products. The six policy recommendations build upon present environmental protection laws, to shift the focus from end of pipe to upfront design and prevention, foster innovation and prompt market changes. Together the six policy recommendations are intended to:

- 1) Build capacity,
- 2) Increase infrastructure, and
- 3) Create tools for better decisions.

### Six Policy Recommendations

1. **Expand Pollution Prevention** and product stewardship programs to more business sectors to focus on prevention rather than simple source reduction or waste controls.
2. **Develop Green Chemistry Workforce Education and Training, Research and Development and Technology Transfer** through new and existing educational programs and public/private partnerships.
3. **Create an Online Product Ingredient Network** to disclose chemical ingredients for products sold in California, while protecting trade secrets.
4. **Create an Online Toxics Clearinghouse**, an online database providing data on chemical toxicity and hazard traits to the market place and public.
5. **Accelerate the Quest for Safer Products**, creating a systematic, science-based process to evaluate chemicals of concern and identify safer alternatives to ensure product safety.
6. **Move Toward a Cradle-to-Cradle Economy** to leverage market forces to produce products that are “benign-by-design” in part by establishing a California Green Products Registry to develop green metrics and tools (e.g., environmental footprint calculators, sustainability indices) for a range of consumer products and encourage their use by businesses.

This report provides details of DTSC's efforts to date in implementing two of the report's six recommendations that were enacted into law in September 2008 and serve as the foundation for the program. This report also provides an overview of options, resources and authority that may be needed to pursue the other four recommendations

## **II. BACKGROUND**

Governor Arnold Schwarzenegger signed Assembly Bill 1879 (Feuer / Chapter 559, Statutes of 2008) and Senate Bill 509 (Simitian / Chapter 560, Statutes of 2008) on September 29, 2008, laying the critical foundation for the Green Chemistry program. These bills provide the authority to implement two of the six Green Chemistry recommendations and establish oversight and advisory panels for the program's implementation.

## **III. IMPLEMENTATION**

### ***RESOURCES:***

DTSC has redirected existing resources to begin the implementation of the enacted provisions including development of regulations, support for the Green Ribbon Science Panel, and development of the Online Toxics Clearinghouse. Teams of staff have been assigned to explore the implementation options for the other four Green Chemistry recommendations.

As DTSC develops the Safer Alternatives regulations and the online Toxics Information Clearinghouse, it continues to assess and incorporate features that define the scope of government responsibilities that will be involved in the various processes. The scope of government responsibilities will help define the resources that will be needed to implement these key provisions into the future.

DTSC is also scoping the resources that may be needed to fully implement the other four recommendations. Staff-led teams have been formed to develop project scoping and implementation plans for the remaining four recommendations. Due to resource constraints, state mandated furlough days, and other limitations, implementation plans have been impacted and are delayed for those recommendations not enacted by AB 1879 and SB 509. It is anticipated that implementation plans for all recommendation will be in place by late summer 2009.

### ***LEADERSHIP COUNCIL:***

At the end of 2008, DTSC expanded the California Green Chemistry Leadership Council, to include all state agencies boards and departments who would be impacted by a comprehensive implementation of Green Chemistry principles or whose wealth of information could be used to

advance green chemistry. Since January 2009 DTSC has met regularly with the following state agencies, boards and departments:

#### Green Chemistry Leadership Council

- Air Resources Board
- Assistant Vice Chancellor for Research Initiatives and Partnerships
- Board of Governors, Community College
- Business, Transportation & Housing Agency
- Cal/EPA Agency
- Community Colleges Economic & Workforce Development
- Council on Science and Technology
- Department of Conservation
- Department of Food and Agriculture
- Department of General Services
- Department of Industrial Relations
- Department of Pesticide Regulation
- Department of Public Health
- Department of Transportation-Caltrans
- Emergency Management Authority
- Employment Training Panel
- Health and Human Services Agency
- Integrated Waste Management Board
- Labor and Workforce Development Agency
- Ocean Protection Council
- Office of Environmental Health Hazard Assessment
- Office of Occupational Safety & Health
- Postsecondary Education Commission
- Resources Agency
- State and Consumer Services Agency
- State Board of Education
- State Water Resources Control Board
- Trustees of State Universities
- University of California, Board of Regents
- University of California, Office of the President

Through the Green Leadership Council meetings, DTSC has kept interested boards and departments informed on developments related to green chemistry; formed three sub-teams to address the goals and objectives of recommendation two (developing green workforce & education); and identified key staff from other Boards and Department that could assist DTSC in developing regulatory text for the safer alternatives regulations that would not duplicate existing programs. DTSC will continue meeting regularly with all stakeholders to exchange information on green chemistry and advance the other four recommendations.

#### **GREEN RIBBON SCIENCE PANEL:**

The enacted green chemistry laws call for DTSC to form a “Green Ribbon Science Panel” to provide advice on green chemistry scientific and technical matters, chemical policy recommendations and implementation strategies. The Panel will ensure that decisions are based on a strong scientific foundation. DTSC extended an open invitation to participate on the Green Science Panel using the news media, the DTSC website and word-of-mouth as the

communications vehicles. DTSC was pleased with the response and with the breadth of experience and knowledge represented by the applicants. Twenty-seven members were selected to serve on the Panel. Members do not represent their affiliated entities but rather provide expert advice in their area of expertise. Three members were selected as co-chairs. Following are the members of the Panel:

NAME	TITLE	AFFILIATION
Ann Blake, Ph.D.	Principal	Environmental & Public Health Consulting
<b>William F. Carroll, Ph. D. Co-chair</b>	<b>Vice President, Chlorovinyl Issues</b>	<b>Occidental Chemical Corporation</b>
Jae Choi, Ph.D.	Senior Manager	AVAYA
Bruce R. Cords, Ph.D.	Vice President, Environment, Food Safety & Public Health	Ecolab, Inc.
George P. Daston, Ph.D.	Victor Mills Society Research Fellow	The Procter & Gamble Company
Tod Delaney, Ph.D	President	First Environment, Inc.
Richard Denison, Ph.D.	Senior Scientist	Environmental Defense Fund
Arthur Fong, Ph.D.	Senior Scientist/Toxicologist	IBM Corporation
<b>Kenneth Geiser, Ph.D. Co-chair</b>	<b>Professor of Work Environment</b>	<b>University Massachusetts-Lowell Center for Sustainable Production</b>
Lauren Heine, Ph.D.	Principal	Lauren Heine Group LLC
Dale Johnson, Ph.D.	President and Chief Executive Officer	Emilium, Inc.
Michael Kirschner	President	Design Chain Associates, LLC
Richard Liroff, Ph.D.	Executive Director	Investor Environmental Health Network
Timothy F. Malloy, J.D.	Professor of Law	UCLA School of Law
Scott Matthews, Ph.D.	Assistant Professor	Carnegie Mellon University
Roger McFadden	Chief Science Office, Vice President Science and Technology	Corporate Express
Kelly D. Moran, Ph.D.	President	TDC Environmental, LLC
Oladele A. Ogunseitan,	Chair	UC Irvine Department of

NAME	TITLE	AFFILIATION
Ph.D.		Population Health & Disease Prevention
Robert Peoples, Ph.D.	Director	American Chemical Society Green Chemistry Institute
Julia Quint, Ph.D.	Chief (retired)	Dept of Health Services Hazard Evaluation System & Information Service
<b>Debbie Raphael, M.A. Co-chair</b>	<b>Senior Manager</b>	<b>San Francisco Department of the Environment</b>
Julie M. Schoenung, Ph.D.	Professor	UC Davis Department of Chemical Engineering and Materials Science
Megan R. Schwarzman, M.D.	Research Scientist and Physician	UC Berkeley Center for Occupational and Environmental Health and UCSF Medical School
Anne Wallin, Ph. D.	Director	The Dow Chemical Company Sustainable Chemistry
John Warner, Ph.D.	President and Chief Technology Officer	Warner Babcock Institute for Green Chemistry
Michael P. Wilson, Ph.D., M.P.H.	Environmental Health Scientist	UC Berkeley Center for Occupational and Environmental Health
Julie B. Zimmerman, Ph.D.	Assistant Professor	Yale University

The first Green Ribbon Science Panel meeting was held on April 29 and 30, 2009 in Sacramento, California. The purpose of the meeting was to receive advice on DTSC's approach to chemical identification and prioritization and alternatives assessment, key components of the regulations being developed. The public provided input to the Panel as well.

The Panel will meet as needed, but no less than twice a year. The next meeting is anticipated to be in the fall of 2009. DTSC plans to maximize the use of internet based resources for conducting meetings.

**Accelerate Quest for Safer Products – Safer Alternatives Regulations (Recommendation #5)**

AB 1879 requires DTSC to adopt **Safer Alternatives Regulations** by January 1, 2011 to create processes that identify and prioritize chemicals of concern, evaluate safer alternatives, and specify the appropriate regulatory responses when chemicals of concern are found in products.

***Public and Stakeholder Involvement***

DTSC's strategy has been to include all of its stakeholders throughout the development of the Safer Alternatives Regulations. Implementation activities for the Green Chemistry Initiative

have been consistent with DTSC's overall Strategic Plan principles of "transparency, accountability and responsibility."

DTSC is making every effort to provide access to all stakeholders in all aspects of the process, debate and deliberation of these efforts, through on-line collaboration, stakeholder forums, workshops and meetings. In January of 2009 DTSC launched a "wiki" forum on its website -- an innovative way of bringing transparency to the rule making process. This forum attempted to provide immediate and easy access for public comment from the start. Following this initial input, DTSC provided stakeholders a "straw proposal" of the regulations, a preliminary draft designed to engender additional comment and discussion.

### ***Wiki***

DTSC created a wiki to help develop the Safer Alternatives Regulations. The wiki was intended to bring transparency to the rule-making process and ensure the public has immediate and easy access to comment and provide suggested edits. It was also hoped to capture the input of Californians and experts worldwide and generate new ideas that are needed to play an integral role in the new Regulations. This approach has met with mixed success, and while it may not have realized what was fully envisioned, this effort has provided valuable insights into the future continuing regulation development efforts, as well as ideas for how to incorporate this tool into other regulation adoption efforts.

### ***Workshops***

DTSC also held the following public workshops throughout the state to interact directly with the public and interested stakeholders, and to solicit recommendations and advice on the content of the proposed regulations:

- [February 18, 2009 in Berkeley](#)
- [February 26, 2009 in Chatsworth](#)
- [March 17, 2009 in Sacramento](#)
- [April 1, 2009 in Sacramento](#)
- [April 21, 2009 in Berkeley](#)

For a complete list of attendees by date click on the appropriate date above or log on to <http://www.dtsc.ca.gov> for additional information.

### ***Industry Challenge***

To further encourage industry participation in the regulation development process, DTSC sent an "industry challenge" to various manufacturers and retailers of primarily baby products and plastic bottles, asking them to share their decision-making processes in for identifying safer product ingredients. This information was sought to assist the department in developing the alternative assessment decision-making tools and guidelines. These companies included:

**“Industry Challenge” Manufacturers and Retailers**

- |  |   |
|--|---|
| <ul style="list-style-type: none"> <li>• Arrowhead/Nestle Waters North America</li> <li>• Avalon Organics/The Hain Celestial Group Inc</li> <li>• Babylicious</li> <li>• Burt’s Bees, Inc</li> <li>• California Baby</li> <li>• Costco Wholesale Corporation</li> <li>• Dr. Brown’s/Handi-Craft Company</li> <li>• EvenFlo Company, Inc</li> <li>• Gerber/Nestle, S.A.</li> <li>• Johnson &amp; Johnson</li> <li>• Kimberly-Clark Corporation</li> <li>• Kirkland Baby Wipes</li> <li>• Learning Curbe Brands</li> </ul> | <ul style="list-style-type: none"> <li>• Little Twig</li> <li>• Luna Lullaby</li> <li>• PBG/Pepsi</li> <li>• Philips DAP-Avent</li> <li>• Playtex Products</li> <li>• Proctor &amp; Gamble’s Pampers</li> <li>• Richardson Bottling Company</li> <li>• Seventh Generation, Inc</li> <li>• The Coca Cola Company</li> <li>• The Nature Center</li> <li>• Touch for Life</li> <li>• Tutti Frutti</li> </ul> |
|--|---|

**Stakeholder Collaboration**

DTSC has met with industry and non-governmental organizations who have expressed interest in providing input on the regulatory framework. A partial list of stakeholders DTSC has met include:

**Industry**

- |   |   |
|---|---|
| <ul style="list-style-type: none"> <li>• Green Chemistry Alliance representing:             <ul style="list-style-type: none"> <li>○ Alliance for Automobile Manufacturers</li> <li>○ American Chemistry Council</li> <li>○ American Electronics Association</li> <li>○ American Forest &amp; Paper Association</li> <li>○ California Chamber of Commerce</li> <li>○ California League of Food Processors</li> <li>○ California Manufacturers &amp; Technology Assoc.</li> <li>○ California Paint Council</li> <li>○ California Restaurant Association</li> <li>○ California Retailers Association</li> <li>○ Can Manufacturers Institute</li> <li>○ Chemical Industry Council of California</li> <li>○ Citizens for Fire Safety Institute</li> <li>○ Consumer Specialty Products Association</li> <li>○ Grocery Manufacturer Association</li> <li>○ Industrial Environmental Association</li> <li>○ Metal Finishers Association</li> </ul> </li> </ul> | <ul style="list-style-type: none"> <li>○ National Paint and Coatings Association</li> <li>○ Personal Care Products Council</li> <li>○ Plumbing Manufacturers Association</li> <li>○ Soap &amp; Detergent Association</li> <li>○ Toy Industry Association</li> <li>○ Western Plant Health Association</li> <li>○ Western States Petroleum Association</li> <li>• Agilent Technologies</li> <li>• Apple</li> <li>• California Industrial Hygiene Council</li> <li>• Dow</li> <li>• Dupont</li> <li>• Good Guide</li> <li>• Johnson &amp; Johnson</li> <li>• Koch Industries</li> <li>• Mattel</li> <li>• Proctor &amp; Gamble</li> <li>• Technet</li> </ul> |
|---|---|



#### Non-Governmental Organizations

- CHANGE representing
  - *Physicals for Social Responsibility-Los Angeles*
  - *Breast Cancer Action*
  - *Breast Cancer Foundation*
  - *Breast Cancer Fund*
  - *California Interfaith Partnership for Children's Health and the Environment*
  - *Center for Environmental Health*
  - *Clean Water Action*
  - *Coalition for Clean Air*
  - *Commonweal*
- *Just Transition Alliance*
- *Science and Environmental Health Network*
- *Silicon Valley Toxics Coalition*
- *United Steelworkers, Local 675*
- *Worksafe*
- Environment Health Sciences
- Environmental Working Group
- International Chemical Secretariat
- Toxics Use Reduction Institute
- William McDonough & Partners

#### State Agency Collaboration

Beyond seeking input from external stakeholders, DTSC also convened a state agencies workshop on May 28, 2009 to seek input from the various Boards, Departments and Offices that may be affected by DTSC's Green Chemistry efforts. The following state agencies were represented at the workshop:

#### State Government Entities

- Air Resources Board
- State Water Resources Control Board
- Business, Transportation & Housing
- Department of General Services
- Integrated Waste Management Board
- Office of Environmental Health Hazard Assessment
- Department of Pesticide Regulations
- Department of Conservation
- Department of Public Health
- Emergency Management Authority
- Office of Occupational Safety & Health

In the workshop, DTSC solicited comments on the "straw proposal," invited collaboration and requested representatives to participate in the development of the *Multimedia Life Cycle Evaluation* - a comprehensive assessment of air, soil, water, human health and other anticipated impacts to the environment that must be taken into account as part of the rule development process for the Safer Alternatives Regulations.

#### Environmental Policy Council

The enacted Green Chemistry legislation expanded the role of the Environmental Policy Council, made up of the heads of Cal/EPA and its constituent boards and departments (Secretary, Air Resources Board, State Water Resources Control Board, Integrated Waste Management Board, Department of Pesticide Regulation, and Office of Environmental Health Hazard Assessment) to oversee critical activities, including:

- Reviewing the regulations to prioritize and identify chemicals of concern
- Reviewing the regulations to analyze alternatives for making decisions on chemicals of concern
- Evaluating any significant adverse impact on public health or the environment, including air, water or soil.

As part of the regulation adoption process, DTSC must prepare a multimedia lifecycle evaluation and submit it to the Environmental Policy Council for its review. The Environmental Policy Council is required to evaluate the proposed regulations and determine that the regulations will not have any significant adverse impact on public health or the environment, or that the regulations will cause a significant adverse impact on the public health or the environment, that alternatives exist that would be less adverse, and recommend those alternatives. In scoping the content of the multimedia lifecycle evaluation, DTSC is collaborating with Cal/EPA and each of the Environmental Policy Council member agencies to better understand their perspectives and how best to portray information to be included in the evaluation.

***External Scientific Peer Review***

According to state law, DTSC is also required to submit the scientific portions of its proposed regulations, along with a statement of the scientific findings, conclusions, and assumptions on which the scientific portions of the proposed regulations are based and the supporting scientific data, studies, and other materials, to an external scientific peer review entity for its evaluation. According to Cal/EPA policy, DTSC will be contracting with the University of California Office of the President to provide this review.

***Rule Development Timeline***

Please see the following timeline for anticipated future activities and milestones.

<b><u>MILESTONE/TASK</u></b>	<b><u>TARGET DATE</u></b>
Meet with state entities and stakeholders	May/June 2009
Green Chemistry Leadership Council Presentation	May 28, 2009
Multimedia Life Cycle Evaluation (for Environmental Policy Council)	July 30, 2009
Completed Proposed Regulations Available	August 4, 2009
Public Workshop on Complete Straw Proposal	Week of August 17, 2009
Draft Proposed Regulations Available	August 31, 2009

<b><u>MILESTONE/TASK</u></b>	<b><u>TARGET DATE</u></b>
Notice for Environmental Policy Committee Meeting	September 3, 2009
Environmental Policy Council Meeting	September 17, 2009
Request for External Scientific Peer Review	September 17, 2009
Presentation to Green Ribbon Science Panel	August & September 2009
External Scientific Peer Review Comments Due	November 1, 2009
Environmental Policy Council Decision	December 3, 2009
Official 45-day Public Comment Period Begins	October 30, 2009
Public Hearing to Complete Public Comment	December 14, 2009
Additional 15-45-day Public Comment Period; if needed	February 11, 2010
Earliest Anticipated Effective Date for Regulations	May 30, 2010

#### **Create an Online Toxics Clearinghouse (Recommendation #4)**

SB 509 authorizes DTSC to **create an online Toxics Information Clearinghouse** that includes science-based information on the hazard, environmental and toxicological end-points of chemical used in daily life. Under the bill:

- OEHHA is to specify the hazard traits, end points and other information about chemicals that is to be made available
- DTSC is to develop data quality and other information requirements for the Clearinghouse.
- DTSC and OEHHA are instructed to obtain Information about chemicals from existing data sources, including data from manufacturers, other states, the federal government, and other countries.

DTSC has been scoping the various alternatives to assemble and make accessible data on hazard traits and endpoints on a Toxics Clearinghouse and has been working collaboratively with the Office of Environmental Health Hazard Assessment on the development of this important informational resource. The Office of Environmental Health Hazard Assessment held a public workshop seeking input on the hazard traits and endpoints to be included in the Clearinghouse, as well as to discuss other critical aspects of data quality and availability.

#### **Data Sharing Agreements**

DTSC has consulted and coordinated with other states, the federal government and other countries to identify available data on hazard traits, environmental and toxicological end-points.

### ***Portal Development***

DTSC has partnered with the University of California, Davis to identify the infrastructure needs for the Online Toxics Clearinghouse. DTSC's goal is to provide the most user friendly and cost-effective access to chemical information. DTSC is developing the portal to provide access to existing information wherever it exists, rather than re-creating and maintaining an additional, duplicative, costly government maintained database.

DTSC has negotiated an interagency agreement with the University of California Toxic Substances Research and Teaching Program, Davis, to provide project planning and scoping services, as well as system and user needs analysis. Activities being coordinated with the University of California include:

1. Identification of stakeholders
2. Develop the business case
3. Functional requirements for:
  - a. User interface
  - b. Business functionality
4. Technical requirements
  - a. architecture
  - b. security

## **IV. PLANS FOR THE REMAINING GREEN CHEMISTRY RECOMMENDATIONS**

DTSC has formed staff-led teams to collaboratively develop workplans that include key deliverables, timelines and resource needs to advance the goals of the other four recommendations.

### **Expand Pollution Prevention (Recommendation #1)**

- DTSC established a team to explore key milestones and resources, implementation strategies and recommended goals and objectives.
- DTSC, working with its Pollution Prevention Program and key stakeholders, will identify options to promote the incorporation of life cycle thinking and green engineering principles into manufacturing processes.

### **Develop Green Chemistry Workforce Education and Training, Research and Development and Technology Transfer (Recommendation #2)**

- DTSC established a team to explore key milestones and resource needs, implementation strategies and recommended goals and objectives.

- Working with the Green Chemistry Leadership Council, DTSC has been focused on collaborative efforts to:
  - 1) Expand Education and training for existing and emerging workforce
  - 2) Incorporate Green Chemistry into existing curriculum for institutions of higher education
  - 3) Create incentives and foster research and development through academia and public/private partnerships.
- Work with private industry and the Employment Training Panel on training and creating a “green jobs” workforce

**Create an Online Product Ingredient Network (Recommendation #3)**

- DTSC established a team to explore key milestones and resource needs, implementation strategies and recommended goals and objectives.

**Move Toward a Cradle-to-Cradle Economy (Recommendation #6)**

- DTSC established a team to explore key milestones and resource needs, implementation strategies and recommended goals and objectives.
- Continue to work with the Department of General Services and Department of Conservation to develop metrics for measuring environmental footprint and improve California’s footprint.