



Green Chemistry Initiative Update

SF Bay Water Board In-House Training on Emerging Contaminants

Sara Hoover, OEHHA

Stan Phillippe, DTSC

January 17, 2008

Introduction to the Green Chemistry Initiative

Develop a coordinated, comprehensive strategy to:

- Foster the development of information on the hazards posed by chemicals
- Reduce exposure to dangerous substances
- Encourage cleaner and less polluting industrial processes
- Encourage manufacturers to take greater responsibility for the products they produce

The strategy must be governed by sound science.

From Secretary Adams' memorandum, April 20th 2007

Timeline

April 2007: Green Chemistry Initiative announced

June 2007: Kick off for interagency workgroups

June – December 2007:

- Workshops, symposia, stakeholder meetings held

- Comments collected via blog and mail

- Options distilled/synthesized by workgroups

December 2007:

- Cal/EPA draft report on “menu of options” prepared

January – June 2008:

- Selected options will be analyzed in detail

June 2008: Recommendations will be delivered to Governor

Blog Participation

As of November 16, extensive comments were contributed via the web site



Visits (Web Hits)	
May	160
June	7,170
July	4,307
August	4,450
September	7,054
October	12,162
November	21,839
Total Hits	57,142

Results

800 “emerging options” were distilled from the comments by the workgroups in four categories:

- Moving toward a cradle to cradle framework
- Stimulating green chemistry
- Addressing toxics in products by design
- Addressing toxics in products by accident

Example Options: Cradle to Cradle

- 1-4 Develop and establish mandatory criteria that must be addressed for all substances used in commerce. Take into account toxicity, effectiveness, volume used/reduction in use, long and short term health and environmental impacts (life cycle).
- 1-11 Mandate a surcharge on chemicals/products to support fund to address long term environmental impacts.
- 1-34 Design with awareness of end of life: 1) Take back 2) Producer responsibility 3) Design to be biodegradable 4) Design to last
- 1-160 Should there be industry specific cradle to cradle standards?
- 1-217 Our continued embrace of plastic needs to be looked at with a cradle-to-cradle perspective, which requires a close look at what is happening overseas.

Example Options: Green Chemistry

- 2-17 Establish regulatory framework that drives green chemistry through prohibitions, cost structures, etc. (i.e. disincentives for using practices that are not in agreement with green chemistry principles).
- 2-23 Partner with UC to create an institute for sustainable manufacturing and green chemistry research.
- 2-44 Support research, development, technical assistance, entrepreneurial activity, and education in green chemistry science and technology
- 2-71 Enable the public to drive green chemistry by providing them with information, such as through a database with green information
- 2-93 Companies and industry associations should be encouraged to share best practices in regards to green chemistry and sustainability including incentives and barriers. Large companies can mentor small companies.
- 2-174 Establish a Green Chemistry Coordination Council to collect and promote the sharing of information, highlight businesses with green practices, provide assistance to businesses lacking resources, and educate consumers.

Example Options: Toxics by Design

- 3-1 Develop science-based criteria for determining whether a particular product is greener or safer than alternatives.
- 3-36 California could require elimination of certain compounds known to be hazardous from products, such as carcinogens, mutagens, reproductive toxicants, developmental toxicants, and chemicals that are persistent and bioaccumulative.
- 3-43 California should develop clear criteria for prioritizing chemicals by toxicity, including aquatic toxicity.
- 3-59 Require disclosure of chemicals in consumer products, focusing initially on high concern chemicals
- 3-79 The Office of Environmental Health Hazard Assessment should be given more funding to evaluate alternative chemicals to determine whether alternatives pose an unacceptable risk.
- 3-129 California should impose appropriate use-restrictions for chemical ingredients when scientific safety-based assessments indicate they cannot be used safely in consumer product or use application.

Example Options: Toxics by Accident

- 4-2 Improve import standards for products manufactured offshore.
- 4-17 Expand and randomize government testing of food and products
- 4-31 Scrutinize who is liable for a toxic product in the chain from manufacturing to sale and ensure there are consequences for the responsible party
- 4-56 Develop a process for rapid removal of products found to be toxic by new studies that is fair to industry—State subsidized transformations
- 4-143 California should fund and improve research in new analytical methods for detection and quantification. Support for key process-related research could yield important new means to reduce the presence of unwanted toxics due to synthesis.
- 4-144 In assessing toxics in products, cumulative risks associated with multiple exposures (through using or being in proximity to multiple products) should be considered.

The Report

The emerging options (many of which overlapped) were further distilled into “synthesized options” under several topic areas, including:

- Data collection
- Education
- Regulatory
- Technical assistance

Themes from Comments Relevant to Emerging Contaminants

- Establish regulatory/statutory requirements to:
 - Develop and report toxicity and exposure data
 - Conduct safety assessments (including lifecycle analyses)
 - Take follow up actions on chemicals, products and processes
- Use CEPA or REACH as a model program

Themes from Comments Relevant to Emerging Contaminants (cont.)

- Develop a “chemical map” of California to track the chemicals that flow into and out of the state
- Increase monitoring, testing, and enforcement
- Improve education on green chemistry/sustainability
- Use incentives to move toward greener chemicals, products and processes

Themes from Comments Relevant to Water Issues

- Implement immediate measures to address known issues in the waste stream (e.g., pharmaceuticals and emerging contaminants)
- Expand regulatory authority and funding for existing state programs and coordinate efforts
- Include potential impacts on water quality and the ecosystem in evaluating chemicals, products and processes
- Require extended producer responsibility

Themes from Comments Relevant to Water Issues (cont.)

- Address sewage treatment, mandate use of ozonation
- Provide incentives for water providers to use green technologies
- Reduce the amount of polystyrene and other non-biodegradable polymeric substances that enter the waste stream, storm drains, watershed and coastal environment.

Green Chemistry

Green chemistry – original definition:

The design of chemical products and processes that reduce or eliminate the use and generation of hazardous substances.

Green chemistry – broader meaning:

Use regulatory and market drivers to:

- Generate the required data, information, technology; and
- Facilitate the ability of key actors to identify and take action on hazardous substances and move toward greener chemicals, products and processes

Opportunities

- Implement green chemistry principles
- Shift the paradigm for chemical regulation
- Collaborate across agencies (including international)
- Invigorate a “green economy” in California
- Improve education on green chemistry and chemicals policy for scientists and the general public

Challenges

- Input so far is generally idealistic and not nuts and bolts
- Significant data, technology and education gaps
- Funding for government activities
- Costs to industry
- Momentum to maintain the regulatory and industry status quo

Current Activities

- Meetings of:
 - Green Chemistry Initiative Science Advisory Panel
 - Green Chemistry Initiative Leadership Council
- Analysis of selected options
 - Additional opportunity for input
- New green chemistry bills likely in legislature

Resources

- California Green Chemistry Initiative:
 - Key documents and general green chemistry resources
<http://www.dtsc.ca.gov/PollutionPrevention/GreenChemistryInitiative/index.cfm>
- OEHHA-COEH Workshop on Practical Decision-Making Tools for Identifying Safer Alternatives materials:
<http://www.oehha.ca.gov/multimedia/green/coeh100107.html>
- UC Berkeley Center for Occupational and Environmental Health Green Chemistry & Chemicals Policy Program:
 - UC report to the legislature and other resources
<http://coeh.berkeley.edu/greenchemistry/>
- Environmental Defense chemicals policy reports:
 - Not That Innocent:
http://www.environmentaldefense.org/documents/6149_NotThatInnocent_Fullreport.pdf
 - High Hopes, Low Marks:
http://www.environmentaldefense.org/documents/6653_HighHopesLowMarks.pdf