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Assembly
California Legislature

ASSEMBLY COMMITTEE ON
ENVIRONMENTAL SAFETY AND TOXIC MATERIALS
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CALIFORNIA'S GREEN CHEMISTRY PROGRAM: ARE WE PROTECTING PEOPLE FROM TOXIC CHEMICALS IN PRODUCTS?

To:	Members of the Assembly Committee on Environmental Safety & Toxic Materials and Members of the Senate Committee on Environmental Quality
From:	Chairs, Assemblymember Bill Quirk and Senator Ben Allen
Subject:	California's Green Chemistry Program: Are We Protecting People from Toxic Chemicals in Products?
Date:	February 12, 2019

The Assembly Committee on Environmental Safety and Toxic Materials and the Senate Committee on Environmental Quality will hold a joint hearing on Tuesday, February 12, 2019, to investigate California's efforts at protecting people and the environment from toxic chemicals in consumer and commercial products. At the hearing, the Committees will explore the role of Green Chemistry in the state and assess California's Green Chemistry program, with a particular focus on the Department of Toxic Substances Control's (DTSC's) Safer Consumer Products regulations.

Background

Chemicals in Products.

Industrial chemicals have become a part of everyday life, contributing to improvements in medicine, technology, and infrastructure and touching just about everything people come into contact with. More than 84,000 chemicals have been registered for use in the United States, and over 700 new chemicals enter the marketplace each year. As more and more chemicals enter our homes and workplaces, the need to better understand and prevent the potential adverse effects these chemicals may have on human health and on the environment becomes even more critical.

According to a 2014 article in *the Journal of Environmental Studies and Sciences,* as a consequence of weaknesses in federal chemicals policy, chemicals suspected of being hazardous are found in numerous consumer and commercial products, including some to which children likely are exposed. Downstream businesses that purchase and use chemicals shoulder the burden of identifying and managing potentially hazardous chemicals in their supply chains. Additionally, the Centers for Disease Control and Prevention have detected hundreds of industrial chemicals in American children and adults. Many of these chemicals have been linked to adverse health effects, but for the majority, there is too little information to understand their potential for long-term harm. Experts estimate that the environmental contribution to disease may explain a quarter to a third of the global disease burden. In addition to human health effects, environmental contamination continues to erode biodiversity and ecosystem health worldwide.[1]

In California, chemical and pollution related diseases among children and workers cost the state's insurers, businesses, and families an estimated $2.6 billion in direct and indirect costs per year. In 2004, more than 200,000 California workers were diagnosed with deadly, chronic diseases - such as cancer or emphysema - attributable to chemical exposure in the workplace. Over that same year, 240,000 cases of preventable childhood diseases related to exposure to chemical substances were diagnosed.[2]

The Centers for Disease Control and Prevention and the Agency for Toxic Substances and Disease Registry, which noted that we lack critical information on the health effects of chemicals, states that government agencies should be encouraged to identify the data needed to fill gaps in the scientific understanding of health risks of chemicals and also to prioritize chemicals of concern for further assessment of exposures and safer alternatives[3].

Green Chemistry.

Green Chemistry, as defined in *Green Chemistry: Theory and Practice*, is "the utilization of a set of principles that reduces or eliminates the use or generation of hazardous substances in the design, manufacture and application of chemical products."[4] For the last century, environmental and public health protection has concentrated on capturing and storing hazardous waste. Green Chemistry is a fundamentally different approach to environmental and public health protection,

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[1] Caroline E. Scruggs, Leonard Ortolano, Megan R. Schwarzman, Michael P. Wilson. "The role of chemical policy in improving supply chain knowledge and product safety." *Journal of Environmental Studies and Sciences*. June 2014.

[2] UC Centers for Occupational and Environmental Health (COEH). *Green Chemistry: Cornerstone to a Sustainable California.* San Francisco: Regents of the University of California. 2008.

[3] CDC and ATSDR. *National Conversation on Public Health and Chemical Exposures*, 2009, https://www.atsdr.cdc.gov/nationalconversation/

[4] Paul Anastas and John Warner. *Green Chemistry: Theory and Practice* (Oxford University Press: New York, 1998).

transitioning away from managing hazardous chemicals to reducing or eliminating their use in the product or process altogether. Green Chemistry encourages cleaner and less-polluting industrial processes, while creating new economic opportunities in the design and use of chemicals, materials, products, and processes.

Green Chemistry in California.

In response to increasing concern about the impact of chemicals in consumer and commercial products, in January 2004, Assemblymember John Laird, chair of the Assembly Committee on Environmental Safety and Toxic Materials, and Senator Byron Sher, chair of the Senate Committee on Environmental Quality, requested technical expertise from the California Policy Research Center at the University of California in the area of chemicals policy. The request was prompted by the Committees' interest in a California chemicals policy that would address public and environmental health concerns while also building long-term capacity in the design, production, and use of chemicals that are safer for humans and the environment.

The resultant 2006 report, *Green Chemistry in California: A Framework for Leadership in Chemicals Policy and Innovation*, identified three primary weaknesses in federal chemicals policy that are affecting California: (1) The Data Gap: Current law does not require companies to prove that chemicals are safe prior to their sale in the marketplace; (2) The Safety Gap: Public agencies do not have sufficient authority to assess chemical hazards and impose controls to protect public health and the environment; and, (3) The Technology Gap: Together, the Data and Safety Gap have produced market conditions that have dampened the motivation of the private sector to invest in Green Chemistry. These three weaknesses must be addressed, the report concluded, if California is to comprehensively and effectively address the health, environmental, and economic damage inflicted by under-regulated chemicals and products.

In 2008, the California Legislature recognized the principle of Green Chemistry, and attempted to address these policy gaps, by enacting two landmark pieces of legislation, AB 1879 (Feuer and Huffman, Chapter 559, Statutes of 2008) and SB 509 (Simitian, Chapter 560, Statutes of 2008). These bills lay the statutory foundation for the state's Green Chemistry program and intend to establish a comprehensive approach to chemicals policy.

The structure for regulatory action required by this legislation is broad and general. Rather than specifying particular chemicals or explicit regulatory action on those chemicals, the statutes authorize state agencies, primarily DTSC, to set up a process to identify and evaluate chemicals of concern and the products in which they are found, and to impose appropriate regulatory action for those chemicals and products in order to protect people and the environment. This unique statutory approach anticipated state agencies playing a greater role in developing strategies and policies designed to meet the general objectives of the statute. Faced with significant agency discretion, the Legislature has an important oversight obligation to assure that state agencies have complied with both the letter, as well as the spirit, of the law.

This informational hearing is part of the California State Legislature's ongoing responsibility to ensure that broad agency authority is utilized effectively and efficiently to protect the public and the environment from toxic chemicals in products.

Statutory Requirements for the California Green Chemistry Regulations.

The bulk of the statutory requirements for establishing regulations governing the Green Chemistry program was included in AB 1879 in Health and Safety Code (HSC) Section 25252, et seq. Its companion bill, SB 509, in HSC Section 25251 and 25256, et seq, also includes provisions related to the regulations. AB 1879 requires DTSC to adopt regulations that fulfill two major requirements: 1) establish a process to *identify and prioritize* chemicals or chemical ingredients in consumer products that may be considered a chemical of concern; and, 2) establish a process for *evaluating* chemicals of concern in consumer products, and their potential alternatives, to determine how best to limit exposure or to reduce the level of hazard posed by the chemical.

Identifying and prioritizing chemicals. When identifying and prioritizing chemicals, pursuant to HSC 25252, DTSC must reference and use available information; establish evaluation criteria that include the traits, characteristics and endpoints of chemicals and their alternatives; and, consider, at a minimum, the following:

1) The volume of the chemical in commerce;

2) The potential for exposure to the chemical in a consumer product; and,

3) Potential effects on sensitive subpopulations, including infants and children.

Potential alternatives and life-cycle analysis. The statutory goal, per HSC Section 25253, of the regulations is to determine how best to limit exposure or to reduce the level of hazard posed by chemicals of concern. Additionally, statute dictates that the regulations must establish a process that includes an evaluation of the availability of potential alternatives and potential hazards posed by those alternatives, as well as an evaluation of critical exposure pathways. This process must include a life-cycle assessment that considers issues such as product function or performance; materials and resource consumption; water and air quality impacts; production, in-use, and transportation energy inputs; greenhouse gas emissions; waste and end-of-life disposal; and, public health, economic and environmental impacts.

Regulatory responses. HSC Section 25253 also requires that the regulations specify the range of regulatory responses that DTSC may take following the completion of the alternatives analysis. The regulatory responses include, but are not limited to, the following actions:

1) Not requiring any action;

2) Imposing requirements to provide additional information needed to assess a chemical of concern and its potential alternatives;

3) Imposing requirements on the labeling or other type of consumer product information;

4) Imposing a restriction on the use of the chemical of concern in the consumer product;

5) Prohibiting the use of the chemical of concern in the consumer product;

6) Imposing requirements that control access to or limit exposure to the chemical of concern in the consumer product;

7) Imposing requirements for the manufacturer to manage the product at the end of its useful life, including recycling or responsible disposal of the consumer product;

8) Imposing a requirement to fund Green Chemistry challenge grants where no feasible safer alternative exists; or,

9) Any other outcome DTSC determines accomplishes the requirements of this article.

Additional statutory requirements. Statute places additional requirements on DTSC while developing the Green Chemistry regulations, including that DTSC must establish a Green Ribbon Science Panel (GRSP) to be composed of members with specified areas of expertise. The GRSP is an advisory body that counsels DTSC on scientific and technical matters in support of the goals of significantly reducing adverse health and environmental impacts of chemicals used in commerce, as well as on the overall costs of those impacts to the state's society by encouraging the redesign of consumer products, manufacturing processes, and approaches.

Summary of the Safer Consumer Products Regulatory Process.

To implement the Green Chemistry statutes, DTSC created what it called a "four-step continuous, science-based, iterative" regulatory process, which it deemed the "Safer Consumer Products" (SCP) regulations, to identify safer consumer product alternatives. The SCP regulations were adopted October 2013. Per DTSC, the regulatory steps are listed below:

1) Candidate Chemicals – The regulations establish an immediate list of "Candidate Chemicals" (~1,200) based on the work already done by other authoritative organizations, and specify a process for DTSC to identify additional chemicals as Candidate Chemicals.

2) Priority Products – The regulations require DTSC to evaluate and prioritize product/Candidate Chemical combinations to develop a list of "Priority Products" for which Alternatives Analyses must be conducted. A Candidate Chemical that is the basis for a product being listed as a Priority Product is designated as a Chemical of Concern (COC) for that product and any alternative considered or selected to replace that product.

3) Alternatives Analysis – The regulations require responsible entities (manufacturers, importers, assemblers, and retailers) to notify DTSC when their product is listed as a Priority Product. DTSC will post this information on its web site. Manufacturers (or other responsible entities) of a product listed as a Priority Product must perform an Alternatives Analysis for the product and the COCs in the product to determine how best to limit exposures to, or the level of adverse public health and environmental impacts posed by the COCs in the product.

4) Regulatory Responses – The regulations require DTSC to identify and implement regulatory responses designed to protect public health and/or the environment, and maximize the use of acceptable and feasible alternatives of least concern. DTSC may require regulatory responses for a Priority Product (if the manufacturer decides to retain the Priority Product), or for an alternative product selected to replace the Priority Product.

Accomplishments To Date.

DTSC has made considerable progress in implementing the first two steps of the four step SCP process.

DTSC identified Candidate Chemicals (the Candidate Chemical list contains approximately 2,300 Candidate Chemicals) and developed a searchable Informational Candidate Chemical Database to assist regulated entities in understanding which chemicals may be subject to the SCP process.

DTSC conducted extensive research to identify the first three proposed Priority Products. The initial proposed Priority Products were announced in March 2014 and rulemaking listing these products as Priority Products commenced in summer 2016.

To date, the SCP has moved deliberatively, with three product-chemical combinations currently finalized and three more in various stages of Step 2. No products have yet undergone the alternatives analysis, which is a process for systematically identifying, comparing, and selecting safer alternatives to chemicals of concern on the basis of hazards, performance, and economic viability. In addition, no product has been subject to a regulatory response yet.

Chemicals and Products Identified by the Safer Consumer Products Program

CHEMICAL	PRODUCT	STATUS
Tris(1,3-dichloro-2-propyl)phosphate (TDCPP) and Tris(2-carboxyethyl) phosphine (TCEP)	Children's Foam Padded Sleeping Products	Regulation adopted 7/1/17
Methylene diphenyl diisocyanates (MDI)	Spray polyurethane foam systems	Regulation adopted 7/1/18
Methylene chloride	Paint or varnish strippers	Regulation adopted 1/1/19

Perfluoro/polyfluoro alkyl substances (PFAS)	Carpets and rugs	Pre-regulatory proposal
Nonylphenol ethoxylates (NPEs)	Laundry detergents	Pre-regulatory proposal
1-methyl-2-pyrrolidone (NMP)	Paint and varnish strippers and graffiti removers	Pre-regulatory proposal

Challenges with Implementation.

In October 2018, the Public Health Institute released a report, *California's Green Chemistry Initiative at Age 10: An Evaluation of its Progress and Promise*, evaluating the Green Chemistry program in California. The report noted that while the Green Chemistry program is an innovative program with the potential to drive the market for safer chemicals and products, and has many of the attributes of a successful chemicals policy, it has failed to achieve its full potential in several ways. According to the report, "the pace of implementation of the SCP Program has been slow and DTSC has unclear authority to collect necessary information on chemicals in products. California's overall efforts and investment have not been sufficient to foster robust research and development of safer product chemistry. The SCP's Candidate Chemical List needs to be updated over time to capture chemicals with Hazard Traits consistent with breast cancer-causing chemicals and other potential health threats. And, the Toxics Information Clearinghouse currently provides no useful information but could be repurposed for more effective use."

The report makes recommendations to improve the program to ensure greater success at making consumer products safer. It recommends the following policy enhancements:

1) The legislature should authorize DTSC to take expedited action when safer alternatives are already available.

2) The legislature should give DTSC clear authority to require manufacturers to disclose the function and use of chemicals in products, maintaining appropriate protections for confidential business information.

3) DTSC, in consultation with the Green Ribbon Science Panel, should evaluate the scientific and procedural foundation of its prioritization process to ensure it is as efficient as possible.

4) The legislature should provide some flexibility in the AB 1879 alternatives analysis criteria to allow DTSC to utilize existing high-quality alternatives analysis. DTSC also needs authority to recoup costs from manufacturers to review analyses or to conduct independent analyses if necessary.

The report also makes the following recommendations related to scientific enhancements:

1) The California Environmental Protection Agency should integrate environmental monitoring data across programs and environmental media, and seek increased support for new monitoring methods and broader biomonitoring of chemicals in people.

2) The legislature should authorize the Office of Environmental Health Hazard Assessment to maintain a watch list of emerging chemicals with hazard traits.

3) DTSC should restructure or repurpose the Toxics Information Clearinghouse.

The report offers the following Green Chemistry and safer product advancements:

1) DTSC should support academic centers for green chemistry. California's universities and colleges must train the next generation of chemists in multidisciplinary approaches that include health and environmental responsibility.

2) DTSC should partner with leading businesses to advance safer chemistry by funding challenge grants, awards, or other strategies to spark innovation.

Lastly, the report further encourages the California Environmental Protection Agency, in order to fully support California's commitment to a safer future, to develop a comprehensive proposal for sustainable and substantially increased funding for all aspects of California's Green Chemistry Initiative.

Where does that leave things?

When Assemblymembers Mike Feuer and Jared Huffman introduced AB 1879, their intent was to create a balanced, science-based, robust, and thoughtful approach to address the danger of hazardous chemicals in consumer products. They maintained that at the time, the regulatory authority of DTSC was limited by statute and only applied to certain classes of consumer products. They pointed to the examples of lead, which at the time could be regulated in jewelry and water faucets, but in few other products, and to hazardous heavy metals, such as cadmium or mercury, which at the time could be regulated in certain electronic or other devices, but in few other products. The intent of the bill was to remove the statutory impediments limiting DTSC's authority to regulate hazardous chemicals in some products, but not others.

Further, the authors intended for AB 1879 to provide for a more expansive, open, and transparent approach without "prejudging" what chemicals or products should be regulated, or what regulatory actions should be taken. They argued that AB 1879 was a multi-faceted approach to provide state regulators with the authority they needed to protect public health and limit Californians' exposure to hazardous chemicals.

In August 2008, the Assembly Environmental Safety and Toxic Materials Committee noted in its analysis of AB 1879, "While it is the intent of the authors to establish an effective, comprehensive chemical policy program and to authorize DTSC to effectively regulate chemicals in consumer products in order to protect public health and the environment, should these bills be signed into law, the Legislature may wish to consider follow-up legislation that includes: more clearly and explicitly defining DTSC's authority to regulate chemicals in consumer products and authority to enforce those regulations, conflict-of-interest provisions for the Green Ribbon Science Advisory Panel process, Legislative appointments to the Panel, trade secret provisions that ensure protection of public health and the environment, and ensuring expedient and efficient action on chemicals and products that may pose imminent public health or environmental hazards."

When California's Green Chemistry program was enacted, no other state had a comparable comprehensive chemicals policy in place. By setting the precedent, California was tasked with creating a new program based on rigorous science to evaluate tens of thousands of chemicals in tens of thousands of consumer product applications – all from scratch. DTSC had to develop ideas, collect reliable information, and implement new approaches, all without a dedicated funding source to support the program, and within existing resources.

It is timely, however, on its 10-year anniversary, to evaluate the state's accomplishments in chemicals policy, as well as its implementation of the spirit and the letter of the Green Chemistry laws.

Has our Green Chemistry program filled the data, safety, and technology gaps we were hoping it would fill 10 years ago? Have we reduced the risk that we all, and especially sensitive subpopulations, face from exposure to toxic chemicals in our homes and workplaces? Have we reduced environmental impacts from product production, use, and disposal? Are manufacturers eliminating unnecessary hazards and making products safer?

At this hearing, the Committees will consider how the state can and should move forward with the Green Chemistry program to ensure maximum protection for all Californians from toxic chemicals in products.