

California's Green Chemistry Initiative at Age 10: AN EVALUATION OF ITS PROGRESS AND PROMISE

SUPPLEMENTARY MATERIALS

METHODS

The qualitative study protocol included a scoping review of the literature, semi-structured interviews with experts in chemical policy representing a range of perspectives, qualitative data analysis of the interview transcripts, and review of draft findings by an Advisory Group and by additional experts who did not participate in the interviews. The research protocol was reviewed by the Institutional Review Board (IRB) at the Public Health Institute and was determined to be "Not Human Subjects Research" because all participants were interviewed in their professional capacity and no personal information was obtained other than names. All interviewees provided written informed consent and all data were analyzed without personal identifiers.

Potential experts were identified through searches of the published literature, membership on advisory committees, and by identifying lead commenters on the regulations. Experts also included senior government officials involved in passage or implementation of the law and regulations, or implementation of other chemical regulatory laws or programs including the federal Toxic Substances Control Act, the European Registration Evaluation, Authorization and Restriction of Chemicals (REACH), the Canadian Environmental Protection Act, and other state chemical laws. This list was reviewed, refined and expanded by other members of the project team and by a project Advisory Group of 9 chemical policy experts representing a range of disciplines and perspectives. The resulting list contained 128 potential interviewees. The experts were classified according to their area of expertise (science, law, policy), geographic location of focus (California, other state, federal, international), and perspective (government, business, non-profit, academia). Some people were coded to multiple perspectives.

Interviewees were selected through a purposeful sampling approach. The list was narrowed according to three criteria: (1) Does the candidate have direct and current expertise on chemical policy? (2) Does the candidate have a perspective that is unique or different from others already selected? and (3) Is the candidate a recognized influential figure in the field? We selected 4-6 people from each of the following categories: (1) California government, (2) California non-governmental organizations, (3) California business, (4) academic, and (5) other state, federal, and international leaders. The experts were contacted by email with a brief description of the study and a request to participate. One expert refused, and one failed to respond. Two additional experts were selected to address the resulting gaps, and both consented. Four experts were interviewed in pairs, resulting

in 20 semi-structured digitally recorded interviews with a total of 24 participants.

Interview questions were developed through the scoping review and input from the Advisory Group (see supplemental materials for the methods of the scoping review and the interview questions). All experts were given the interview questions and consent form in advance. Interviews were conducted in March and April 2018 by one interviewer (GS), in person whenever possible. The interviewer has 22 years of experience in chemical policy and has worked in the government, academia and non-profit sectors. She had access to study subjects and was able to facilitate the open expression of views and ask appropriate follow-up questions to clarify perspectives from the experts. Interviews were digitally recorded and the duration ranged from 46-102 minutes.

Audio files were professionally transcribed and transcriptions were checked against the audio files by the interviewer. Transcripts were uploaded to Dedoose® for coding (SocioCultural Research Consultants 2018). The dual interviews were coded and analyzed as single interviews. Transcripts were read iteratively and coded by two researchers (GS and AH). The coding structure was refined twice after consultation among members of the team, and transcripts were re-coded to the new terms. The coding generated 799 unique text excerpts with 2784 code applications for analysis. The number of coded excerpts per interview averaged 40 with a range from 25 to 75. The data analysis was performed using a combination of qualitative and quantitative content analysis.

Preliminary findings and recommendations were reviewed by all members of the project team and by the 8 member Advisory Group. Preliminary findings were also presented to 10 additional chemical policy experts representing all perspectives, from the initial list, for feedback and additional perspectives and to ensure that no important area was missed. The findings were synthesized with the literature review to create a ten-point framework for chemical policy. The performance of the California Green Chemistry Initiative was then evaluated against each element of the framework on a qualitative scale.

SCOPING REVIEW OF THE LITERATURE

The objective of the scoping review was to identify publications most relevant to an evaluation of the California Safer Consumer Products Program, the California Toxics Information Clearinghouse, and the California Green Chemistry Initiative. The review also included other relevant

publications with policy recommendations related to alternatives analysis, green chemistry, chemical safety and chemical policy. The goal was to use the scoping review to both inform and supplement the interviews and ultimately to inform a framework to define the components of an effective chemical policy.

Papers included in the scoping review were located by searching PubMed and WestLaw. Last searches on 15th May 2018. The full search strategy in PubMed included the MeSH-terms and text words listed below. The full search strategy in WestLaw utilized the Advanced Search page and the exact phrases and terms listed below.

Exclusion criteria included non-English language publication and publication prior to 2004. After review of the title or abstract, publications were also excluded if they focused only on any of the following categories: drugs, tobacco, firearms, pesticides, hazardous waste, air pollution, ecotoxicity, methods of toxicity testing or risk assessment.

The initial searches generated 517 English language publications since 2004. Deduplication and exclusions based on review of the title resulted in 112 publications. Review of the abstracts resulted in 38 additional exclusions. The remaining 74 publications were reviewed in full by one reviewer, and the full reference lists for the 10 most relevant papers were also reviewed to identify additional publications that might have been missed in the initial search. Each interviewee was also asked to recommend any papers that might not have been captured using the above search methods. Using these methods, an additional 23 publications were identified and included, resulting in a total of 97 publications for review.

Recommendations were identified from each publication. Where publications did not include specific recommendations, they were categorized as providing general background information. Recommendations were categorized according to topic and used to generate a framework of topic areas and subtopics relevant to chemical policy.

Search Terms:

“Safer Consumer Products”[All Fields] AND “California”[All Fields]

“Toxics Information Clearinghouse”[All Fields] AND “California”[All Fields]

“Green chemistry”[All Fields] AND “California”[All Fields]

“Hazardous substances”[MeSH Terms] AND “California”[All Fields]

“Alternatives analysis”[All Fields] OR “Alternatives assessment”[All Fields]

“Chemical policy”[All Fields]

“Chemical safety”[MeSH Terms]

“Confidential business information”[All Fields]

CALIFORNIA GREEN CHEMISTRY POLICY PROJECT INTERVIEW QUESTIONS

1. Reviewing the findings and recommendations of the Green Chemistry Initiative Scientific Advisory Panel, which of the findings and recommendations are being implemented effectively in California or elsewhere? In which areas does more need to be done?
2. Have you been following the implementation of AB 1879 (the Safer Consumer Products Program)? If yes: What do you see as the strengths of that law and of the program? In which areas does more need to be done?
3. Have you been following the implementation of SB 509 (the Toxics Information Clearinghouse)? If yes: What do you see as the strengths of that law and of the Clearinghouse? In which areas does more need to be done?
4. There are many laws and programs designed to protect the public from toxic chemicals. Some examples include: TSCA, REACH, Prop 65, other state laws, and corporate efforts. If you are familiar with any of these, what do you see as their main strengths or weaknesses relative to the California program?
5. Some people have criticized the Safer Consumer Products Program for being slow. At the same time, many people support a deliberative process. What are your thoughts on efficiency in the current process, as well as on whether it is appropriately deliberative and transparent?
6. Are there criteria that you think would be particularly helpful for selecting Priority Products?
7. What do you see as the role of government in promoting green chemistry, and what is the role of the private sector?
8. Do you have suggestions about how to deal with confidential business information (CBI) in a way that appropriately prioritizes the public right-to-know while also protecting information that truly needs to be protected?
9. The Safer Consumer Products Program does not have a dedicated source of funding. Do you have suggestions for a funding structure that would provide stable support for the program?
10. In the past, the legislature has sometimes taken action to ban or regulate a specific chemical or group of chemicals, sometimes specifically in one or more products. Are there situations where legislative action may still be advisable? If so, please describe when legislative action may make sense, instead of going through the regulatory process.
11. Is there anything more that you think could be done to accelerate the transition to greener chemistry?