

April 30, 2008

To: Department of Toxic Substance Control

From: The Thursday Group

RE: Green Chemistry Initiative Request for Comments on Specific Questions

The Thursday Group is a coalition of business interests who are committed to promoting public policies that strike a reasonable balance between economic growth and environmental protection. We believe that environmental protection is an integral component of doing business in today's world and can provide a company an additional selling point in garnering customers. California has some of the most stringent environmental laws in the country, which in most instances, go well beyond federal laws. The continued prosperity of the state's economy is dependent on leadership that utilizes these laws to protect the environment while leaving California's businesses the flexibility to implement innovative, cost-effective solutions that promote business objectives.

Industry remains hopeful that the Green Chemistry Initiative will deliver a framework for consideration of chemical issues that will ensure decisions based on the weight of scientific evidence; and one that is grounded in the realities of today's global marketplace. Unfortunately, California debate on chemicals has been preoccupied with "bans" and has seemingly indulged the simplistic notion that chemicals are somehow foisted on society with little or no regard for safety. That is simply not the case. These issues are complex, and the State needs to help industry and the larger society deal with that complexity. A number of the questions addressed to the stakeholder community seem at odds with that aim.

Environmental awareness has evolved dramatically over the past 50 years. So too, has our technical capacity in detection of chemicals and our scientific understanding of the nature of chemical hazard and risk. Industry – from primary chemical manufacturers down the value-chain to consumer product producers – are very actively adjusting to these realities and taking steps to further enhance the safe use of chemicals in our society. The challenge of green chemistry is not to "ban" or "tax" or somehow rid the World of hazard. Rather, it is to recognize that effectively managing chemical hazard remains the key to enable ongoing societal benefit from chemistry. The Green Chemistry Initiative should help catalyze and accelerate the adaptation already under way within industry, including more systematic application of the principles of Green Chemistry and Green Engineering. It is in that spirit that we offer the following as initial responses to your questions:

Question #1: How much should the tax be on hazardous chemicals produced, used, or distributed in California?

The Thursday Group members do not believe that a tax on the production of hazardous chemicals is a viable policy option for California. First, there are considerable political barriers to imposing a tax in the state of California because of the two-thirds supermajority required in the legislature. Second, we believe that a tax on production provides incentives for businesses to move production out of California and leaves California businesses at a disadvantage at a time when the economy is softening. Third, we believe that there are insurmountable problems with placing an equitable tax on hazardous chemicals and the possibility of creating adverse incentives is significant.

A tax on the production of chemicals in California would serve to stifle the development of newer and safer alternatives to chemicals that are currently on the market. If the goal of the Green Chemistry Initiative is to facilitate the development of safer alternatives to chemicals already in use, then a tax would be counterproductive.

There are hundreds of potentially toxic substances and no generally recognized metric to determine the toxicity of chemicals. There would be a significant regulatory burden in initially setting tax rates for hundreds of substances. In addition, there would be a regulatory burden associated with adjusting the rates as new toxicity information becomes available. In addition, most chemicals have multiple uses. A chemical may be benign in one application and create significant risks in a different application. A tax scheme cannot create the proper incentives in a situation where the risk in using a chemical depends, in many instances, on the particular application.

We fundamentally believe that any tax scheme would face insurmountable political problems, equity problems, and would serve to further stifle development of new and safer chemicals.

Question #2: What information would trigger a ban of a chemical by the state of California?

The Thursday Group members believe Green Chemistry is about the reduction of risks to health and the environment, and not simply substituting one hazard for another. A risk reduction policy that accounts for the economic, social, health and environmental dimensions of chemistry should be developed as a more rational alternative to the precautionary principle.

Stricter management controls, such as bans of existing chemicals, provide no guarantee of “greener” outcomes, although this has been implied by others. Green chemistry explicitly identifies materials or processes that reduce health and environmental impact while maintaining or improving cost-effective performance. A regulatory action taken against an existing chemical may or may not be supported by a careful analysis of the health and environmental impact of substitute products or processes; and those substitutes may or may not provide cost-effective performance to meet the specific societal need. Unless such an analysis occurs, it is not clear that regulatory action will actually improve health and environmental outcomes while meeting the needs of society.

While the toxicity of a substance is an important consideration in a risk based evaluation, the potential for toxicity *must be considered in the context of exposure* – including

exposure level, route, duration and timing. Every substance can produce toxicity under certain exposure conditions. Even common-place substances usually thought of as benign, such as water and table salt, can cause death when ingested at too high a dose over short periods of time. While this is obviously an extreme illustration of this point, the logic remains true. Any conversation over banning water due to toxicity would reasonably turn to the societal and health benefits of water and the fact that an appropriate amount of consumption would lead to no harm. This is, of course, a risk based evaluation that leads to the correct outcome.

DTSC has an important opportunity to consider how it can promote “green chemistry” by leveraging the significant work already done by many different organizations related to chemicals in commerce. In the vast majority of cases, information on particular chemicals, uses, or exposures is or can be readily available from a number of sources. Well-conceived options for additional regulatory authority should address how California can identify priority risks, appropriate information on manufacturing, import and use, and information on available risk reduction measures.

The question is not just, “How do we control toxic substances?” but also how do we successfully manage both toxicity and exposure--risk--while providing the solutions society needs? The answers to these questions are best provided through:

1. Risk assessment methods that integrate knowledge regarding potential hazards of chemicals with an understanding of their uses and exposures in their various applications.
2. A product stewardship and risk management programs that establish mechanisms to assure exposures remain in the safe region for typical uses and foreseeable misuses.
3. Laws and regulations that:
 - Are science-based
 - Balance potential risks with benefits
 - Factor in existing scientific knowledge as well as reasonable uncertainties
 - Consider the degree of risk to people and the environment.

California should not unwind the past century of technological advancement by creating a system of banning chemicals that is very likely to have vast societal and economic impacts, while potentially doing very little to improve health and environmental impacts. Risk based analysis must be the core of any system that determines when and how a chemical can and should be used.

Question #3: What incentives should the state of California provide to promote the development of safer alternatives?

The State could establish a center for conducting life cycle analysis, potentially using the resources of the university system. The Green Chemistry Initiative should not create a risk in the development of safer chemicals and product alternatives by constructing a system that will prematurely force chemicals and alternatives into the market. In the quest for cleaner air, MTBE was added to gasoline, only to find it could cause water contamination problems. Large scale use of ethanol in gasoline, as an alternative oxygenate, and with an intention to reduce CO2 production, now appears to be having

unintended consequences on land use, food supply and prices. This potential for unintended consequences shows why decisions on chemical bans and substitutions of key chemicals must be undertaken only after careful analysis. The safeguard is to conduct life cycle analysis of alternatives compared to existing chemicals and products.

In addition, Green Chemistry/Engineering could be added as a degree program within the university system. Such a curriculum could be integrated with the center conducting life cycle analysis. The university system, through its curriculum and through publications, could enhance and spread both Green Chemistry engineering and life cycle analysis techniques.

Industry is responsible for most of the development today of safer chemicals and alternative products. Development of new chemicals and products is fraught with risk. The State could minimize or assist with some of that risk. Those risks include financial loss, delayed entry into the marketplace, and liability. New products carry the risk of performing less well than expected or causing unexpected consequences. Limits on liabilities for those failures or adverse consequences could provide a climate more conducive to development.

Tax incentives could be provided for research and development with an additional incentive for the successful introduction of a safer chemical or product. Regulatory review and approval could be expedited in a manner that does not sacrifice quality of research, but does increase efficiency. Often, companies are precluded from launching new products nationally because only California has yet to conduct its review and grant approval.

The State should also recognize innovation as a way to provide positive feedback to companies that make substantial progress. As with any business, a positive public perception is necessary for true success. If the state of California is going to set innovation as a priority, the state should develop a program for public recognition of those companies who meet these new challenges.

California must determine if the development of safer alternatives to products currently on the market is simply a desire or a priority. The development of recognition programs, tax incentives, regulatory efficiency, and liability mitigation would be a declaration of California's priorities and willingness to be a partner in this process.

Question #4: What would be the appropriate response by the state of California for failure to use safer alternatives?

The Thursday Group members believe that this question is quite simply asked in the wrong way. If California develops an effective system for the development of safer alternatives then new and innovative products will be available on the market for use by manufacturers. The market will then determine who does and does not use an available alternative.

The same chemical may be used in many different applications by many different companies. This does not mean that an alternative that is developed will be able to perform the same function as the original chemical in all applications. Further, the "safer" alternative may only truly be "safer" in some applications. The substitution of one

chemical for a “safer” alternative will determine not just on the fact that it is “safer” in the eyes of a regulatory scheme.

Question #4 is posed in a way that invites a discussion of negative incentive, or punishment for not engaging in a behavior. It also presumes that the State has developed and applied a defensible, science-based process and developed related criteria for determining what is “safer,” recognizing also that such judgment must necessarily be made on an application-specific basis (see Q #2). Instead, we should recognize that the decision of manufacturers to use one chemical over another is far too complex and confidential to allow for a system that punishes choices. California should instead seek to provide an incentive for companies to use safer alternatives in their products, especially when a move to an alternative causes significant investment and risk on the part of the business.

Question #5: What would be the appropriate response by the state of California for failure to disclose product ingredients?

The Thursday Group members believe that there should not be a single type of response by the state of California for failure to disclose product ingredients. Current law already contains product-specific labeling requirements that provide varying degrees of product ingredient disclosure based on the type of product. These labeling and reporting requirements were designed specifically for the product categories to which they apply in order to meet the specific needs of those products. The Green Chemistry Initiative should not create a one-size-fits-all approach for the disclosure of product ingredient information when there are already well established and enforced guidelines that have been crafted to suit the needs of specific product categories.

There is also a significant concern about the state’s ability to guarantee the protection of confidential business information. Many California businesses succeed or fail based on their ability to protect their specific process or formula from competitors, many of whom are out of the country and for which no real legal remedy is available. More importantly, the whole notion of stimulating “Green Chemistry” and “Green Engineering” depends hugely on stimulating innovation. In the chemical industry, innovation can require enormous R&D investment. Failure to systematically protect confidential information would significantly undermine incentives to innovate. Any discussion related to disclosure of product ingredients must begin with a commitment by the state of California to protect confidential business information.

Question #6: By what date should the state of California require reusable or biodegradable non-petroleum based packaging?

This question assumes that a systematic, life-cycle analysis has been completed that demonstrates alternative packaging materials offer clear environmental benefits. Packaging materials are selected by businesses, retailers, and consumers for a variety of reasons including: performance requirements, packaging integrity, durability, and in some cases cost, especially for many small family-owned businesses.

It is important to understand that no packaging type is manufactured or used “in a vacuum” as each material type has its own unique environmental footprint. Any state policy governing packaging materials must take into consideration a variety of factors, including energy, water, and air emissions during manufacturing, transportation, and

use; contribution to waste minimization; contribution to reduction in greenhouse gas emissions; recyclability, etc.

It is important to note that switching to these “degradable” materials is not without environmental impacts. As one example, the production of corn for the raw material of PLA has substantial water quality impacts. Furthermore, many in the recycling industry have expressed concern over the widespread use of degradable beverage containers that are now emerging in the marketplace and the negative impact these containers could have on the current plastic bottle recycling stream. Bio-based packaging material degrades under appropriate composting conditions. However, bio-based packaging that is included in the regular municipal solid waste stream will likely find its way to a landfill where degradation will not occur.

Simply suggesting a date in which alternative packaging materials would be required glosses over the comprehensive nature of assessing environmental impacts associated with packaging. A complete analysis of a packaging material across its entire lifecycle is necessary to garner the most complete environmental impact assessment. These facts are important to consider when discussing potential policy options or recommendations. California should not set an arbitrary deadline mandating an alternative when the appropriate analysis has not been completed. Again, there is the risk of unintended consequences.

Question #7: How can industry use a multi-media standard, such as ISO 14000, to demonstrate they achieve performance above and beyond compliance with regulatory standards for product and processes?

Green Chemistry and Green Engineering have iterated a series of principles that should be prominent in approaching the challenge of new chemical product and process development across the breadth of industries involved with chemicals and chemical applications. Importantly, these will only be consistently and broadly applied across that range of institutions by systematic management practices. Such practices would be aimed at assuring that the aforementioned principles are routinely addressed and taken into account in product and process design. While such a system is not yet fully in place, elements are evolving in a number of voluntary standards taking shape within industry, such as under the Product Stewardship Code of the American Chemistry Council’s Responsible Care program, or under the 14000 series of the International Standards Organization (ISO). The notion of a management system approach to Green Chemistry and Green Engineering is simply that certification under such a system would, in essence, provide assurance that “this company applies practices that systematically minimize potential chemical-related environmental and health effects of products by applying principles of green chemistry and green engineering.”

We recommend that Cal-EPA evaluate and certify particular management systems which have a demonstrated track record of improving environmental performance in the manufacturing process and the final product. This should be an evergreen or iterative process in recognition of the fact that many management systems are still being developed or are in early stages of implementation and do not have an established track record. Companies would have the flexibility to choose the system(s) that best fit their needs. A certification requirement tied to each system and coupled with Cal-EPA certification of the overall system would allow participating companies to demonstrate to

the public their commitment to exceed all applicable regulatory standards, while accommodating (not stifling) process and product innovation.

Voluntary standard/certification programs have evolved to assume greater prominence in industry affairs over the past two decades. In a marketplace that transcends sovereign jurisdictions, "management system" standards and related certification have assumed an important role as a tool to inform the market place (and, in some cases, the regulatory community) that certain practices are systematically adhered to. In the instance of ISO 9000, for example, certification provides assurances that management systems are in place to drive a very high and predictable degree of quality control.

Such systems evolve to meet needs of a global market place pressured to achieve consistently high standards. Quality control demands of that marketplace yielded ISO 9000 as a globally recognized standard for ensuring certain performance standards that can be routinely achieved only by consistent application of management system practices. Third-party certification is developing as a common tool to assure customers and others that these practices are in place, without the necessity for each company to directly audit each of their suppliers.

In the area of enhanced environmental performance, ISO 14000 has the Environmental Management System as its cornerstone. This framework can help companies minimize various environmental impacts and comply with applicable laws and regulations, all of which are certified by a third party. A number of related management standards have evolved to deal with specific challenges in this arena, including:

- ISO 14004 provides guidance on the development and implementation of environmental management systems
- ISO 14010 provides general principles of environmental auditing (now superseded by ISO 19011)
- ISO 14011 provides specific guidance on audit an environmental management system (now superseded by ISO 19011)
- ISO 14012 provides guidance on qualification criteria for environmental auditors and lead auditors (now superseded by ISO 19011)
- ISO 14013/5 provides audit program review and assessment material.
- ISO 14020+ labeling issues
- ISO 14030+ provides guidance on performance targets and monitoring within an Environmental Management System
- ISO 14040+ covers life cycle issues

Question #8: What lines of scientific data (in vitro toxicity and other relevant properties) should the state of California consider and use for decision-making in the absence of traditional animal toxicity data?

The Thursday Group members believe that all lines of scientific data may potentially be useful, depending on the relevance and quality of the data as it relates to the specific decision being made. The data being considered to support replacing or substituting one substance with another should be sufficient to demonstrate that the replacement substance is "safer" than the substance being replaced. "Safer" includes not only its potential toxicity to humans and laboratory test animals, but also its potential

impact to the environment (air and water quality), ecological receptors, and global warming.

The lines of data that may be relevant and informative in a determination regarding toxicity include: *in vitro* toxicology (microbial and higher complex organisms), *in vivo* toxicology (animal and human), pharmacology, physiologically-based pharmacokinetic data, pharmacodynamics, structure-activity relationship modeling, mode of action, benchmark dose modeling, bioaccumulation and any other type of data typically used in the registration of products with chemicals and substances. Environmental data is also very relevant in a determination that an alternative is safer. Lines of environmental data include: ecological toxicity, environmental persistence and degradation, physical and chemical characteristics, environmental fate and transport, and human exposure potential.

It is important to recognize that, regardless of the tests or tools utilized, acquisition of scientifically valid data requires significant investment both to develop and use effectively. Data requirements should therefore be applied in a tiered process, with data demands tailored to the priority and characteristics of the substances in question.

Question #9 What criteria should the State of California require as part of alternatives assessment by industry in determining which products are safer/greener?

The Thursday Group members believe that California should use the same criteria for alternative assessment that is used for chemicals and applications that are currently in use. Creating a different standard for alternative assessment would lead to unintended consequences and undermine the goals of the Green Chemistry Initiative.

Question #10: How should the State of California use data (generated by others) in the chemical matrix for deciding which products are safe?

The question implies that a matrix can be developed that can encapsulate sufficient information to make decisions about “which products are safe.” That is not the case for two reasons. First, the judgment of whether a product is “safe” is necessarily a function of how it is to be used – it is application-specific (see Q#2). Second, the notion of a matrix seems to rest on the assumption that for any given chemical there can be a definitive data-point for each health or environmental endpoint of concern, with the matrix simply serving to indicate where those data-points have been determined. The reality is that characteristics for some endpoints (corrosiveness, for example) can be made with relative clarity under well established criteria. For others, however, judgments must be made considering the weight of competing scientific evidence. The matrix should not presume to reflect such judgments, as this would effectively “lock-in” conclusions. The often evolving character of science relevant to a specific chemical and specific endpoint argues instead that the “matrix” should be instead a vehicle for signaling whose endpoints for a given chemical for which there is relevant data, and potentially be a portal to link to the most current of that data to enable the most refined judgment at any given point in time.

California should use all available data when making decisions about which products are safe. Again, there is the underlying belief on the part of The Thursday Group members

that a risk based evaluation will provide the most appropriate guidance when deciding which products are safe. This does not preclude the inclusion of specific types of data or specific sources of data. What it does require is that data be considered in context that accounts for the economic, social, health and environmental dimensions of chemistry instead of taken and considered in isolation.

Question #11: If third party life cycle analyses are required for specific products or materials, what State Agency, e.g. Department of Consumer Affairs, should be responsible for certifying or authorizing individuals to perform them?

The decision about whether or not a firm is qualified to conduct a “certified” life cycle analysis is one which should be made by an entity within Cal EPA, not a bureaucratic agency which is used to simply issuing business licenses. Cal EPA must be integrally involved in this process to add credence to the certification. They need to establish standards for the personnel involved, specify the components required in the evaluation, and define how the various elements of the analysis will be weighed. Importantly, such judgments should be made with knowledge and consideration of the evolving state-of-the-art in life cycle assessment (for example, under the ISO 14040 series referenced in Q #7).

The Thursday Group members listed below are strong advocates of the philosophy that the marketplace should choose winners and losers when it comes to products. We hope that the information we have provided above will assist you in crafting a program that will achieve the goals of the Green Chemistry Initiative while avoiding a regulatory scheme that serves to stifle innovation, slow the economy, and negatively impact job growth in California.

While the Green Chemistry Initiative does provide an opportunity for rational and comprehensive consideration of the use of chemicals in products, we are concerned that the result will be a command and control regulatory scheme that serves more to impede innovation. It is vitally important to members of The Thursday Group that this program be developed in a manner consistent with risk based evaluation. Sound science should be the platform upon which this regulatory structure operates, but this process must also give due consideration to the economic and societal needs of all Californians.

The Thursday Group Members

Agricultural Council of California	California Business Properties Association
Alliance of Automobile Manufacturers	California Chamber of Commerce
American Chemistry Council	California Citrus Mutual
American Electronics Association	California Construction and Industrial Materials Association
American Forest and Paper Association	California Cotton Growers & Ginners Association
BIOCOM	California Farm Bureau Federation
Bromine Science and Environmental Forum	California Film Extruders and Converters Association
California Association of Wheat Growers	
California Building Industry Association	

California Forestry Association
California Grain and Feed Association
California Grocers Association
California Hotel & Lodging Association
California Independent Oil Marketers
Association
California Independent Petroleum
Association
California League of Food Processors
California Manufacturers & Technology
Association
California Motor Car Dealers
Association
California Natural Gas Producers
Association
California Paint Council
California Railroad Industry
California Restaurant Association
California Retailers Association
California Seed Association
California Space Authority
California Wood Industries Coalition
Carpet and Rug Institute
Caterpillar Inc.
Chemical Industry Council of California
Chlorine Chemistry Council
Consulting Engineers and Land
Surveyors of California
Composite Panel Association

Consumer Specialty Products
Association
CTIA-The Wireless Association
DuPont
Engine Manufacturers Association
Formaldehyde Council, Inc.
Grocery Manufacturers Association
Industrial Environmental Association
International Council of Cruise Lines
Lumber Association of California and
Nevada
Metal Finishing Association of Southern
California
Nisei Farmers League
Pacific Merchant Shipping Association
Personal Care Products Council
Plumbing Manufacturers Institute
Rubber Manufacturers Association
Soap and Detergent Association
Society of the Plastics Industry
Styrene Information and Research
Council
Surface Technology Association
Western Growers
Western Plant Health Association
Western States Petroleum Association
Western United Dairymen
Western Wood Preservers Institute
Wine Institute