SENATOR JOE SIMITIAN
CHAIR, CALIFORNIA SENATE COMMITTEE ON ENVIRONMENTAL QUALITY
HEARING ON THE UC GREEN CHEMISTRY REPORT: BUSINESS PERSPECTIVES
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TESTIMONY OF
MICHAEL P. WILSON, PHD, MPH
ASSISTANT RESEARCH SCIENTIST
CENTER FOR OCCUPATIONAL AND ENVIRONMENTAL HEALTH
UNIVERSITY OF CALIFORNIA, BERKELEY

Slide 1. Mr. Chairman, thank you very much for inviting me to the hearing today to address private sector concerns about chemicals policy in California. I would like to describe our findings in this area as contained in the UC report, *Green Chemistry in California: A Framework for Leadership in Chemicals Policy and Innovation.*

Slide 2. As you know, the report was engendered by interest on the part of Byron Sher and John Laird in developments in E.U. environmental policies and their implications for California, and…

Slide 3. …by the challenges they and other legislators faced in grappling with an array of chemically related bills facing the Legislature.

Slide 4. An Advisory Committee of UC faculty provided technical oversight for the report.

Slide 5. Our findings are similar to those of many other analyses that have been produced over the last 20 years.

Slide 6. During this period, we have seen an evolution in chemical management from disposal and dilution, to waste treatment and pollution control, to chemical-by-chemical toxics policy (as exemplified by the federal Toxic Substances Control Act) to chemicals policy approaches that focus on the design of chemicals and chemical systems. The UC report was informed by this fourth stage of development.

Slide 7. The report focuses primarily on the barriers and drivers of green chemistry, and proposes that California should reduce the barriers and take full advantage of the drivers.

Slide 8. I would like therefore like to briefly address three key questions: What is green chemistry, what are the barriers to green chemistry, and how can California address these barriers?

Slide 9. The first is "What is green chemistry?"

Slide 10. Green chemistry is the design of chemical products and processes to reduce and/or eliminate substances hazardous to human health and the environment.

Slide 11. Green chemistry links public and environmental health with new business and investment opportunities.

Slide 12. Like clean energy, green chemistry is truly the only alternative available to us that offers the possibility of a sustainable future. This is evident when we consider the scale and pace of U.S. chemical production and importation, which each day would fill over 600,000 tanker trucks stretching from San Francisco to Wash D.C. and back. Chemical consumer and commercial products sold in California alone in a single day would fill 2,700 tankers.

Slide 13. Much of this material enters the earth's ecosystems, and much of it comes in contact with people through various routes.

Slide 14. Moreover, global chemical production is doubling every 25 years.

Slide 15. By 2050, when California's population reaches 50 million, global chemical production will expand four-fold from what it is today. On the current trajectory, this will produce a deepening set of health and environmental problems. We can affect this trajectory by designing chemicals to be safer for biological systems; that is, through green chemistry practices.

Slide 16. The key question explored in the report therefore is, "what are the barriers to green chemistry?" Why hasn't green chemistry become more successful commercially?

Slide 17. The report illustrates that the answer to this question lies with weaknesses in chemicals policy in the U.S., specifically with the U.S. Toxic Substances Control Act, or TSCA, which has produced Data, Safety, and Technology Gaps in the U.S. chemicals market. These Gaps have undermined the commercial viability of green chemistry.

There is a Data Gap in the amount and quality of information in the U.S. market on the hazards of chemicals because TSCA does not require producers to generate and disclose this information to EPA and to downstream users.

There is a Safety Gap in government oversight because TSCA overly constrains the ability of government to assess and control chemical hazards.

There is an emerging Technology Gap in green chemistry technologies that stems from the Data and Safety Gaps and from the lack of U.S. public investment in green chemistry research and education.

Slide 18. For example, imagine you are running a vehicle repair shop and need to purchase chemicals such as an aerosol degreasing product for cleaning oil and grease off the vehicle.

Slide 19. In making your purchasing decision, you would take into account four things: the products intended **function**, its **price**, its **performance**, and its **hazardous properties**. In the case of chemicals, this refers to toxicity, ecotoxicity and other attributes.

Slide 20. As a result of the TSCA Data Gap, the hazard piece of your purchasing decision is largely unknown. The entire chemicals market functions with this same lack of information on chemical toxicity, from small vehicle repair shops to the largest multinational companies in the Silicon Valley. As a result, companies can't choose the safest chemicals, and they end up being responsible for handling hazardous chemicals. Companies spend $7-10 dollars handling every dollar's worth of chemicals they purchase.

Slide 21. If you are a scientist working at a state-level government agency to evaluate and prioritize chemical hazards in the state, you need at a minimum information on the **identity** of chemicals sold in the state, their **sales volume**, their **uses**, and their **hazardous properties**.

Slide 22. Due to the weaknesses of TSCA, this information is unavailable to state agencies.

Slide 23. The report describes five implications of the Data and Safety Gaps.

1)Businesses and consumers are unable to identify hazardous chemicals or choose safer ones.
2) The market thus "undervalues" the hazardous properties of chemicals compared to their function, price, & performance.
3) Hazardous chemicals have therefore remained competitive in the market.
4) This has impeded the market for green chemistry…
5) and has left businesses with the problems that result from using hazardous chemicals.

Slide 24. It is not surprising, therefore, that you can earn a PhD at U.S. universities without demonstrating even a rudimentary understanding of chemical hazards; how chemicals affect human health and ecosystems.
Our universities simply reflect what is demanded in the market. The report argues that this will lead to a green chemistry Technology Gap as other countries, particularly the E.U., invest in green chemistry research and development.

Slide 25. How can California address these barriers to green chemistry?

Slide 26. The report lists three overarching recommendations and describes a number of issues related to each of these. The report recommends that California close the three Gaps by improving the flow of information in the chemicals market, improving government capacity to know and to act, and implementing other incentives for green chemistry.

It lists elements of ideal policy mechanisms, which would leverage market forces, address the full chemical life cycle, place the least demands on government, motivate technology innovation and diffusion and so forth.

Slide 27. Will this happen overnight? Of course not. The chemical production system is enormously complicated and is integrated with nearly all facets of the economy. U.S. businesses purchased $288 billion in chemicals in 2003. In California, industries for which 10% or more of material inputs are derived from chemistry employed over 4 million people in 2004. As I noted earlier, California purchases over 600 million pounds of chemicals in consumer and commercial products alone, each day.

Slide 28. At the same time, it is likely that if California chooses not to pursue a modern, comprehensive chemicals policy, we can expect that our existing chemical problems will expand, the state could become a dumping ground for chemicals and materials no longer permitted for sale in the E.U., and we will cede leadership in green chemistry to other U.S. states.

Slide 29. California has demonstrated that we can exert enormous influence on economic systems, such as the way electricity is used. Per capita, California now uses 50% of the electricity compared to the rest of the U.S. This has resulted from a series of policy decisions over many years. It now saves the average household $1,000 a year; total savings have reached $56 billion; and it has greatly reduced our emissions of greenhouse gases. The recent climate change bill goes even further, of course. The UC report illustrates that we can provide this same kind of leadership in chemicals policy in a way that steadily shifts our chemical production system to one based on green chemistry and that in doing so, we will open an array of new business and investment opportunities in California that are likely to find an expanding global market.

Senator, thank you very much, and I would be happy to take questions now or later, at your discretion.

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