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BUSINESSES AND ADVOCACY GROUPS CREATE A ROAD MAP FOR SAFER CHEMICALS: THE BIZNGO PRINCIPLES FOR CHEMICALS POLICY

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ABSTRACT

This paper details how businesses and environmental organizations are collaborating to define and implement a visionary agenda for integrating safer chemicals into products, describing the challenges they confront and how they are overcoming those challenges. The framework for this assessment is the Principles for Chemicals Policy developed by the Business-NGO Working Group for Safer Chemicals and Sustainable Materials (BizNGO). The four principles—1) knowing and disclosing chemicals in products, 2) assessing and avoiding hazards, 3) committing to continuous improvement, and 4) supporting public policies and industry standards—while appearing to be straightforward, are, in fact, very complex to implement in practice. Together businesses and environmental organizations are charting a path to safer chemicals by sharing best practices, addressing technical aspects of safer chemicals substitution, and analyzing and supporting public policies that advance the rapid development and diffusion of greener chemicals in the economy.

Keywords: safer chemicals, chemicals policy principles, business, NGO, collaboration, innovation, green chemistry, toxics use reduction, pollution prevention, informed substitution, alternatives assessment

The 21st century is a time for innovative and sustainable solutions to global environmental threats, including the accumulation of hazardous chemicals in the ecosphere. Over the past four decades, chemicals and their impact on human health and the environment have been the focus of many advocacy campaigns. Media reports of toxic chemicals in products, food, our bodies, wildlife, and house dust continue to drive consumer demand for chemically safe products and government regulation [for example, see 1, 2]. In response, some businesses continue to react defensively, claiming that exposures do not cause harm, that voluntary regulation is sufficient, and that safer alternatives will cost jobs and create a competitive disadvantage. For example, the president of the American Chemistry Council, Calvin M. Dooley, recently testified before Congress that the proposed safety criterion in legislation to reform the Toxic Substances Control Act of 1976 would set "such an impossibly high hurdle for all chemicals in commerce that it would produce technical, bureaucratic, and commercial barriers that would stifle the manufacturing sector,'" [3]. This "economy versus environment" response assumes that we live in a zero-sum world where investments in clean production and healthy products come at the expense of economic development.

Proactive business leaders, however, realize that toxic chemicals are not necessary for, and often impede, economic success. They know that toxic chemicals in manufacturing and products present a business risk, and the long-term sustainability of their organizations depends on responding before consumer demand shifts and regulations emerge [4]. They are developing chemical management plans to reduce the use of highly hazardous chemicals and adopting tools and strategies to help them move to safer alternatives. In this economic model, investments in safer alternatives are necessary for sustainable economic growth.

This paper details how businesses and advocacy organizations are collaborating to define and implement a visionary agenda for integrating safer chemicals into products, the challenges they confront, and how they are overcoming those challenges. The frame for this assessment is the Principles for Chemicals Policy developed by the Business-NGO[1] Working Group for Safer Chemicals and Sustainable Materials (BizNGO) [5].

THE EVOLUTION OF BizNGO— THE BUSINESS-NGO WORKING GROUP FOR SAFER CHEMICALS AND SUSTAINABLE MATERIALS

that report, Greiner et al. extracted from six case studies a range of strategies employed by leading companies to manage chemicals and materials in their products. The study found that, while the companies' individual actions to address toxic chemicals vary, their best practices, when gathered together, define the terrain of healthy chemical strategies:

- identify all chemicals in products;
- eliminate high-hazard chemicals;
- strive to use only green chemicals;
- commit to product redesign;
- take responsibility for products cradle-to-cradle;
- adopt internal chemical policies, including the precautionary principle;
- work collaboratively with environmental advocates; and
- publicly support government reform of chemical policies [4, p. 52].

At the time of the release of *Healthy Business Strategies*, advocacy organizations were conducting market campaigns to transform chemical and material use in specific industry sectors. These market campaigns, which are still active today, engage the electronics, health care, personal care, and building sectors because of their power to transform markets through purchasing and end-of-life product management decisions [6]. For example, Health Care Without Harm, an international coalition striving for ecologically sound and healthy health care practices, has worked for 15 years with hospital systems and group purchasing organizations to change the chemical selection decisions of medical device manufacturers [6, p. 6].

Seeing the alignment between the best practices of business leaders and the vision and demands of the market campaigns, Clean Production Action convened 22 organizations in October 2006 to discuss opportunities for mutually promoting safer chemicals and sustainable materials. At the meeting, participants, which included HP (Hewlett-Packard), Dell, Kaiser Permanente, Nike, Whole Foods Market, Health Care Without Harm, the Healthy Building Network, the Breast Cancer Fund, the Ecology Center and the Electronics Take Back Coalition,[2] agreed to form BizNGO and penned its mission: To promote the creation and adoption of safer chemicals and sustainable materials in a way that supports market transitions to a healthy economy, healthy environment, and healthy people.

A UNIQUE COLLABORATION

participants from companies, environmental NGOs, government agencies, and universities. Businesses range from small, mission-driven companies like Method and Seventh Generation to very large, multinational corporations like HP and Staples, Inc. to major institutional purchasers like Kaiser Permanente, Catholic Healthcare West, Premier, and Novation. Advocacy organizations cover a similar range, from the Ecology Center in Michigan and the Environmental Health Strategy Center in Maine to national organizations like the Breast Cancer Fund and the Natural Resources Defense Council [7].

Business leaders greatly value dialogue with NGOs. As Michael Passoff, Senior Program Director for As You Sow stated, "NGOs such as Clean Production Action and the BizNGO group have been useful in working cooperatively with corporations to set benchmarks and policies that are more realistic based on both the current science and the risk to shareholders. . . . In fact, I would say that the NGOs are doing a better job of pointing companies to safer products than the industry trade associations are" [8].

NGOs are often at the forefront of identifying the next chemical of concern. The business-NGO dialogue helps companies understand public trends in human and environmental health concerns with chemicals, as well as the rationale for these concerns—providing manufacturers with an early warning process. The cross-sectoral representation of NGO groups allows business leaders to understand the priorities of the environmental health movement, which helps inform their work to advance safer chemicals and products within their companies. In return the NGO participants value the insights that companies have into the challenges and opportunities that businesses face in demanding more information from their supply chain and incorporating safer chemicals and materials into their products. This adds value and effectiveness to the work of both companies and the advocacy community.

BizNGO also facilitates rich business-to-business (B2B) conversations across industry sectors, with representation ranging from chemical formulators to original equipment manufacturers to institutional purchasers. Such B2B communication of chemical-level information down the supply chain to article manufacturers and institutional buyers is critical for making informed decisions on the health and environmental impacts of the products used by consumers. The synergy of having only companies that are downstream users of chemicals within BizNGO is strategic and intentional. These companies have unique needs, as compared to chemical manufacturers, in terms of both managing chemicals in products and promoting appropriate public policy initiatives.

Chemical manufacturers differ from downstream users because their chemicals

and cost, they can switch without increased costs and sales may increase due to substituting a safer alternative for a toxic chemical. Also, downstream users, being closer in the supply chain to final consumers, are held liable to a greater extent for product safety. Downstream users need information on chemical ingredients and their associated hazards to make wise product design decisions. Chemical manufacturers, on the other hand, often consider the composition of chemical products and their hazard characteristics as investments to be protected.

THE BizNGO PRINCIPLES FOR CHEMICALS POLICY

In 2008, after a year of discussions and many revisions, BizNGO released its Principles for Chemicals Policy [5]. The Principles are a set of aspirational goals designed to guide internal business decisions for advancing safer chemicals through product design, purchasing specifications and corporate decision making:

- Principle #1: Know and disclose chemical ingredients in products.
- Principle #2: Assess and avoid hazards.
- Principle #3: Commit to continuous improvement.
- Principle #4: Support public policies and industry standards that advance the first three principles.

The Principles were refined and agreed upon through a consensus-driven dialogue within BizNGO. The most challenging discussion centered on BizNGO Principle #1, to "disclose" product chemistry. In the end, BizNGO participants agreed with the ideal that chemical ingredients should be disclosed and that the current market trajectory is towards greater chemical and material transparency, but they recognized that this ideal may not be achievable or desirable in every instance. Thus the participants qualified "disclose" to state that manufacturers will "increase as appropriate the transparency of the chemical constituents in their products, including the public disclosure of chemicals of high concern" [5]. The category "chemicals of high concern" comprises substances that are any of the following: 1) persistent, bioaccumulative and toxic (PBT); 2) very persistent and very bioaccumulative (vPvB); 3) very persistent and toxic (vPT); 4) very bioaccumulative and toxic (vBT); 5) carcinogenic; 6) mutagenic; 7) reproductive or developmental toxicants; 8) endocrine-disrupting; or 9) neurotoxic. "Toxic" (T) includes both human toxicity and ecotoxicity.

The BizNGO Principles present a vision of where organizations should be, not necessarily where they are today. While a handful of leading companies

value" [4, p. 10]. Among the endorsers of the Principles are HP, Staples, Catholic Healthcare West, Construction Specialties, Kaiser Permanente, Method, Novation, Premier, Seventh Generation, Brooks Running, and Whole Foods Market [5]. BizNGO participants are now finalizing a how-to-guide to help companies chart success in implementing the Principles (discussed below under Principle #3).

Principle #1—Know and Disclose Product Chemistry

A significant barrier to implementing green chemistry at the user level is the lack of information on chemical constituents in products. Downstream users are often frustrated by their suppliers' use of confidential business information to block access to information on chemicals in products, and current regulations do not require this transfer of essential data [9]. Ingredient transparency in products is an essential element in implementing the principles of green chemistry [10]. While this is especially true of chemicals of high concern to human health or the environment, downstream users ultimately need to know the identity of all chemical ingredients in products. Increased transparency with regard to chemical ingredients in products is needed up and down the supply chain.

The statement of Principle #1 (see box) that "Manufacturers will identify substances used and associated with and used in a product across its lifecycle" is a medium-range goal that will emerge with advances in data gathering and knowledge. In the interim it commits companies to developing a deeper understanding of the chemistry of their products and the life cycle impacts of chemical production, use, and disposal.

The intent of Principle #1 is that formulators, manufacturers, and assemblers will know all the chemical constituents intentionally added to their product, as well as any residuals of high concern, and will commit to understanding the life cycle impacts of the chemicals in their products. A residual is a trace amount of a chemical or chemicals that are incidental to manufacturing. Residuals are not

BizNGO Principle #1:
Know and Disclose Product Chemistry

Manufacturers will identify the substances associated with and used

part of the intended chemical product, but are present because of factors such as the nature of the synthesis and engineering pathways used to produce the chemical.[3] Formulators, manufacturers, and assemblers will also commit to disclosing as much of this information as possible down the supply chain. The responsibility of product purchasers is to request these data from their suppliers, to reinforce this information flow.

Seventh Generation, for example, "believes full ingredient transparency is necessary for consumers to verify the health and safety of the cleaners they use. We fully disclose the ingredients in our products on the label, including explanations of each ingredient in a format guided by federal requirements for cosmetics. In addition, the ingredients and material safety data sheets (MSDSs) are available on our website, as are disclosures of trace materials that may be present when known" [11].

For more complicated products, such as consumer electronics, which involve hundreds of components from thousands of suppliers, the acquisition of full chemical ingredient disclosure from upstream suppliers is more complicated. Seagate Technology, the world's largest manufacturer of hard disk drives, is striving for full material disclosure from its suppliers. Hard disk drives comprise several hundred individual components that Seagate purchases from 250 to 300 suppliers. Seagate's implementation of an automated Compliance Assurance System requires its component suppliers to report on all substances present, regardless of whether or not the substance is "restricted" by Seagate [12].

As Dr. Patricia Beattie, formerly the Director of Chemical Risk Management—Environmental Services for General Motors, emphasizes, "Business-to-business communication of chemical-level information down the supply chain through to article and end-product manufacturers is critical for making informed decisions on the health and environmental impacts of the products used by Americans" [13].

Principle #2—Assess and Avoid Hazards

Knowing chemical ingredients in products is a prerequisite to implementing Principle #2—a company cannot assess the hazards of chemicals in a product without knowing the chemical ingredients. Assessing all the chemical ingredients in a product, in turn, is essential to avoid the surprise of learning that a product is suddenly under public scrutiny for its potential risks to human or environmental health. Often a "new" chemical becomes of concern to a company because its product contains the chemical, but the company did not include it among its

BizNGO Principle #2:
Assess and Avoid Hazards

Manufacturers will determine the hazard characteristics of chemical constituents and formulations in their products, use chemicals with inherently low hazard potential, prioritize chemicals of high concern for elimination, minimize exposure when hazards cannot be prevented, and redesign products and processes to avoid the use and/or generation of hazardous chemicals. Buyers will work with their suppliers to achieve this principle.

By understanding the hazardous properties of all chemicals used in their processes and products, companies are better informed to implement toxic use reduction measures. These actions, in turn, position a company to stay ahead of regulation, both government and retail, and position it favorably with respect to advocacy campaigns, avoiding negative publicity and damage to its brand.

For formulators, manufacturers, and assemblers, Principle #2 entails assessing the hazards of chemicals in products, prioritizing chemicals for reduction or elimination, and conducting alternative assessments (see box). The Toxics Substances Control Act, the principal statute regulating industrial chemicals in the United States, does not require chemical producers, either U.S. or foreign, to generate and disclose robust information on the toxicity of the vast majority of chemicals in commercial circulation. Given this lack of information about chemicals in products, businesses that use chemicals may find it difficult to identify and choose safer alternatives.

To avoid the myriad problems associated with the use of toxic chemicals, companies typically target a short list of "chemicals of high concern" for their products, such as persistent, bioaccumulative toxicants (PBTs), and then expand the list to a broader number of chemicals, such as those on California Proposition 65 list [14]. Companies may also use the popular ChemSec Substitute It Now (SIN) list of chemicals of very high concern [15].[4]

Kaiser Permanente, the largest managed health care organization in the United States, strives "to purchase products that do not contain PBTs such as mercury or polybrominated diphenyl ethers (PBDEs), carcinogens like formaldehyde or reproductive toxicants like di-2-ethylhexyl phthalate (DEHP) [16]." For an

Lists (RSLs) and their Implications for Green Chemistry and Design for Environment" [17].

Some businesses are moving beyond negative lists to positive lists, identifying the types of chemicals they prefer as opposed to what they want to avoid. For example, Construction Specialties, a mid-sized building products company, is seeking to meet the demands of building owners, architects, contractors, and building occupants who "increasingly are selecting products made with chemicals that have low to no toxicity" by "using chemicals that are inherently safer for humans and the environment" [18]. Nike released its report, *Nike Restricted Substances List (RSL) and Sustainable Chemistry Guidance*, in March 2010, which "encourages all suppliers to use the Principles of Green Chemistry [10] to inspire innovation. These principles are a part of an overall concept of sustainability. Designing and producing materials around these principles can be used at any stage in the supply chain to improve sustainability as well as protect the consumer, worker, and the environment" [19].

To assess chemical hazards and identify safer alternatives to chemicals of high concern, companies are increasingly turning to the Green Screen for Safer Chemicals. The Green Screen benchmarks chemicals into categories of low, moderate, or high concern [20]. One BizNGO participant, HP, is now the global leader in using the Green Screen [21, p. 73]. The Green Screen assesses chemicals and their degradation products against a suite of human health and environmental endpoints. Each chemical goes through a rigorous assessment and is assigned to one of the following:

- Benchmark 1: Avoid—Chemical of High Concern;
- Benchmark 2: Use but Search for Safer Substitutes;
- Benchmark 3: Use but Still Opportunity for Improvement; or
- Benchmark 4: Prefer—Safer Chemical.

HP has found the tool to be robust, replicable and workable for their suppliers. Other original equipment manufacturers and their suppliers, including chemical manufacturers, are now committed to piloting the Green Screen, and it is HP's goal to standardize the use of this tool within the global electronics sector.

Avoiding chemicals of high concern means specifying and selecting safer alternatives. Safer alternatives range from chemical, material, or product substitutions to systematic change that eliminates the need for the chemical. In their Alternatives Assessment Framework, Rossi, Tickner, and Geiser emphasized the nested relationship between chemical, material, and product substitutions (see Figure 1) as well as the opportunity for systematic change [22].

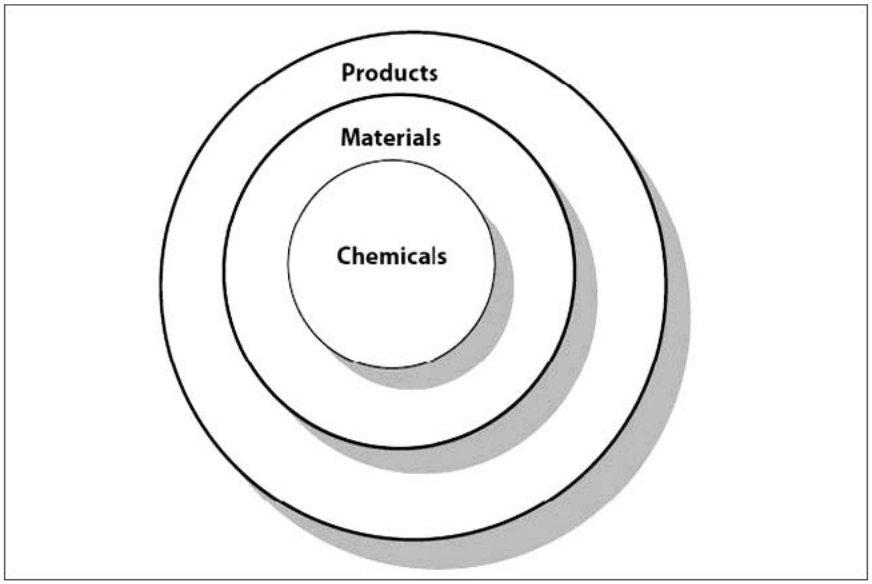

Figure 1. Nested relationship among chemicals, materials, and products. **Source**: Mark Rossi, Joel Tickner, and Ken Geiser, Lowell Center for Sustainable Production, *Alternatives Assessment Framework of the Lowell Center for Sustainable Production*, 2006, http://www.sustainableproduction.org/downloads/FinalAltsAssess06_000.pdf (accessed March 14, 2011).

may be developed by corporate leadership, then not fully implemented in all areas of the company. Alternatively, one individual may become the "chemicals expert," then leave the company, only to have chemical initiatives lag.

Establishing corporate policies, goals, and procedures is essential to the successful implementation of any corporate program. As Richard Liroff emphasized in his article on corporate benchmarking, "Foresighted corporations can engage in a systematic review of chemicals in products, work with their suppliers to reduce or eliminate product toxicity, and respond creatively to the growing demand for environmentally preferable goods" [23].

In writing Principle #3 (see box), BizNGO participants echoed Liroff's emphasis on the importance of systematic integration of the Principles into corporate policies and guidelines. For example, Catholic Healthcare West, the

BizNGO Principle #3:
Continuous Improvement

Establish corporate governance structures, policies and practices that create a framework for the regular review of product and process chemistry, and that promote the use of chemicals, processes, and products with inherently lower hazard potential.

alternatives identified through hazard analysis. We develop goals and metrics to measure our progress and evaluate our results, and share our successes and lessons learned with others" [24].

BizNGO participants are currently developing a guide that describes a series of benchmarks for implementing BizNGO's four principles in company policy and practice. The implementation guide will identify best (and better) practices that lead to the implementation of each of the four principles. The guide is designed as a resource for internal evaluations of progress toward achieving the principles as well as an external document for communicating progress toward increased use and promotion of safer chemicals. It will specify best practices for product manufacturers and purchasers and give clear benchmarks for charting progress over time.

Principle #4—Support Public Policies and Industry Standards

While companies may be diligent in their initiatives to reduce the use of chemicals of concern in their products and manufacturing processes, they may be reluctant to speak publicly about their efforts and to openly support policy change. Within companies, there may be a lack of understanding between government or public affairs staff and staff who are working to implement chemical or design changes. By announcing goals to reduce toxicity in some way, companies may open themselves to public criticism if they are unable to meet the goals in a stated timeframe. Companies may not wish to break rank with trade associations advocating that existing chemicals policy is sufficient. Companies may also simply see advocating for policy change as outside their mission.

Public policies and industry standards[5] must change to accelerate the development and use of safer alternatives to chemicals of high concern. Greiner et al.

BizNGO Principle #4:
Support Public Policies and Industry Standards that:

Advance the implementation of the above three principles, ensure that comprehensive hazard data are available for chemicals on the market, take action to eliminate or reduce known hazards and promote a greener economy, including support for green chemistry research and education.

commitment to implementing a safer chemicals program across the organization: from product design and manufacturing to purchasing to government affairs [4, p. 47]. Integrating support for authentic safer chemicals policy initiatives into corporate chemical policy programs represents a significant departure from the status quo of downstream users conceding the public policy domain to chemical manufacturers.

The participation of downstream users of chemicals in the policy debate is critical to creating policies that meet the unique needs of companies that use chemicals or manage chemicals through the products they purchase (see box for key elements of policy reform as expressed by BizNGO in Principle #4). As Bob Sussman, the U.S. Environmental Protection Agency's senior policy counsel, emphasized at a Washington, D.C., meeting of business and NGO leaders, downstream companies "occupy a unique position at the end of the value chain, where the rubber meets the road. . . . Your voice is critical. We want to encourage you to stay in the game and to help shape the end product" [25].

While each participant in BizNGO approaches public policy initiatives from its unique organizational position, their positions are informed by Principles #1 and #2. For example, the mid-sized specialty building products manufacturer and BizNGO participant, Construction Specialties, specified that chemicals policy reform will complement the green building movement if it:

- provides comprehensive hazard and toxicity data for all chemicals on the market;
- requires greater disclosure of chemicals of high concern in products;
- prioritizes chemicals of high concern such as PBTs for early action; and
- promotes safer alternatives [18].

consumers, employees, communities, and investors; and improve transparency throughout the supply chain. As Howard Williams of Construction Specialties testified on July 29, 2010 at the House Hearing on the HR 5820—Toxic Chemicals Safety Act of 2010: "Identifying the chemical composition of our products is a costly and time-consuming process. . . . [Although this is] a profitable and responsible thing to do," he explained, gathering ingredient information "needlessly delays product development and places an indirect cost burden on the consumer" [3]. BizNGO participants succeeded in integrating supply chain disclosure of chemical ingredients into HR 5820; however, subsequently that bill died in the 111th Congress [26].

CONCLUSION

The BizNGO Principles for Chemicals Policy offer businesses a clear roadmap for integrating greener and safer chemicals into their organizational policies, operating processes, and product designs. They are an organizational analogue—guiding organizational decision-making to safer chemicals—to the 12 Principles of Green Chemistry, which offer chemists a "benign by design" framework to synthesize more eco-compatible molecules.

The co-development of the Principles by BizNGO participants resulted in a framework for advancing best practices across industry sectors in managing chemicals in products. As downstream users of products, BizNGO participants are leading a transformation in the market for chemicals, materials, and products. They are generating broad change by acting through their own supply chains to demand information on: 1) the identity of chemicals in products; 2) the inherent hazards of those chemicals; and 3) whether safer alternatives are available for these chemicals of high concern.

At the same time, opposition to these demands is significant. Upstream chemical suppliers either do not have data on human and environmental health effects of the chemicals they sell or they refuse to share that information with their customers. Significant data gaps in hazard information exist for the great majority of chemicals, not just those suspected to be of high concern, which in turn stymies informed substitution to greener chemicals. U.S. chemicals policy reform to improve transparency and accountability in the chemicals market is now a campaign focus for environmental NGOs. The voice of downstream users of chemicals gives regulators and legislators a more balanced view of the business risk associated with incomplete information, and it helps correct the assumption that new regulation is bad for business. Without the voice

be those who learn quickly how to meet these demands, well ahead of policy reforms. In addition, the Principles incorporate corporation-wide decisions on public policy. This integration is intentional, in that it motivates both companies and advocacy organizations to clearly articulate how new chemicals policies and environmental regulations can most effectively meet the chemical information needs of companies and the public, to assess chemicals for their hazardous properties, and to promote the development and adoption of safer alternatives.

These Principles, while appearing to be very basic, are complex to implement in practice. This highlights the contribution of BizNGO and its collaborative working groups. Through this safe interactive space, participants exchange best practices, discuss technical aspects of safer chemicals substitution, and analyze and support policy options for the most expedient way to advance greener chemicals uptake in the economy.

Success in the movement to safer chemicals will require transformations in both business and public policies. The BizNGO Principles for Chemicals Policy contribute to this transformation by articulating the needs of both downstream business users of chemicals and the environmental health advocacy movement. The process of co-development of the BizNGO's four Principles and the collaborative ongoing work to advance the Principles provides a model for others working to address the human and environmental health concerns associated with chemicals and to support a market transition to a healthy economy, healthy environment, and healthy people.

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