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Toxic Substances

Stakeholders Mull Need for Strategy To Address Emerging Chemical Issues

European regulations, U.S. state laws and purchasing policies, and increased attention to chemicals are spurring the need for a national or international strategy to address emerging issues related to chemicals, officials from a range of industries, nongovernmental organizations, and academia told BNA in interviews over the past two months.

Some senior chemical industry officials, however, said they are not convinced a national strategy is needed or viable. Further, it is not clear what types of programs or actions would be included in a national strategy to address emerging chemical issues, nor is it clear what problem such a strategy is meant to solve, they said.

Industry is getting nickeled and dimed with bans.

MICHAEL KIRSCHNER, CONSULTANT FOR ELECTRONICS MANUFACTURERS

''Waste and recycling regulations from other nations hit U.S. manufacturing like tsunamis,'' said Michael Taubitz, who works on health, safety, and environmental issues with the Automotive Industry Action Group, an organization that aims to resolve issues critical to the automotive supply chain. Taubitz also works with the American National Standards Institute's (ANSI) Company Member Forum.

International Initiatives Affecting Product Design. He and Michael Kirschner, president of San Francisco-based Design Chain Associates, a consulting firm for electronics manufacturers, referred to product redesigns that have resulted from European Union directives such as:

- the End-of-Life Vehicle (ELV) Directive that required automotive companies to limit the use of hazardous substances and increase the quantity of recycled material used in the manufacture of their vehicles;
- the Restriction of Hazardous Substances (RoHS) Directive, which limits the amount of lead, cadmium, mercury, hexavalent chromium, and polybrominated biphenyl and polybrominated diphenyl ether flame retardants that can be in electrical and electronic equipment;
- the registration, evaluation, and authorization of chemicals (REACH) legislation;
- the Waste Electrical and Electronic Equipment (WEEE) Directive, which in tandem with RoHS is designed to restrict the use of certain hazardous substances in electrical and electronic equipment and encourage the recycling of such equipment to limit the total quantity of waste being disposed; and
- the Energy-using Products (EuP) Directive, which is designed to spur the design of electrical and other equipment to reduce their harmful impacts on the environment.

Taubitz and Kirschner also cited the effects of two U.N.-endorsed measures, the Globally Harmonized System of Classification and Labeling of Chemicals (GHS) and the Strategic Approach to International Chemicals Management (SAICM).

Domestic Action Also Prompting Change. Richard Liroff, founder of the Investor Environmental Health Network, pointed to additional domestic actions driving companies to rethink the chemicals in their products, including:

- the California Safe Cosmetics Act of 2005, which went into effect in January and requires cosmetic manufacturers to report the use of potentially hazardous ingredients to the state Department of Health Services (DHS), which in turn will alert consumers;
- California's biomonitoring law, which creates the nation's first statewide program to track human exposure to toxic chemicals. Under the law, a nine-member panel is to be formed by Sept. 1, 2007, to guide development and implementation of the biomonitoring program;
- bans on cosmetic lawn pesticides issued by many of Canada's major cities;
- a growing number of state policies requiring the purchase of cleaning and other products that pose fewer health or environmental concerns than the products they replace; and
- Wal-Mart's Preferred Chemical Principles, under which the retailer will announce 20 chemicals it will urge its suppliers to phase out of their products (30 CRR 1180, 11/13/06).

According to Kirschner, ''Industry is getting nickeled and dimed with bans.''

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RoHS Exposed 'Very Serious Problems.' The EU's RoHS Directive, which went into effect July 1, 2006, ''exposed some very serious problems in the electronics industry,'' Kirschner said, referring to information the industry realized it did not have about the chemicals in its products.

''The supply chain that has developed over the last century as industry developed mass production techniques focused on getting information to understand the functional properties of chemicals,'' Kirschner said.

The failure to think about the environmental impact of materials—from when their raw materials are extracted from the Earth through the energy used to make them through disposal—has resulted in the absence of information to truly understand the environmental impacts a firm's products have, Kirschner said.

Taubitz said a formal process, or a proactive approach to ''lean and green'' design, is needed to address emerging chemical issues and support sustainable development.

During a Sept. 26-27 workshop, Innovation and Competitiveness: A Strategic Approach to Emerging Chemical Issues, held by the National Institute of Standards and Technology, Taubitz listed the common elements in the EU laws and U.N.-backed initiatives. They include concerns about chemicals and product design, the huge costs the measures cause for U.S. manufacturers, and the absence of input from downstream chemicals users as the policies were being developed.

Strategy to Deal With What Comes Next. ''As ugly as it will be, industry will muddle through REACH and deal with GHS,'' Taubitz said. But he added that he wants some kind of process or strategy in place to deal with ''what the heck comes next in 2010'' before that date.

Taubitz and Kirschner said a process is needed that brings together different types of companies and other interested parties not only to exchange information but to understand how to balance trade-offs.

If a firm is looking to substitute a chemical of concern, it could face a situation in which alternative chemicals had certain benefits, such as being less likely to cause allergic responses, but were more harmful to the aquatic environment, Kirschner said.

''In most industries, we have no idea how to do trade-offs,'' Kirschner said.

Also lacking is an effective mechanism to electronically transfer information that needs to flow through the supply chain, he said. Instead of having access to a continuing flow of information, manufacturers must scramble to get data they need once a chemical or use of a chemical is regulated.

Both men hope a workshop ANSI will hold in August and a ''sustainability center'' established in February by the Synthetic Organic Chemical Manufacturers Association (SOCMA) will help firms exchange information and learn how to identify substitutes for chemicals they must—or decide to—stop using.

ANSI's meeting, Action and Reaction: Developing a Sustainable Approach to Emerging Chemical Issues, is designed to address the economic and regulatory impact that foreign chemical controls and regulations are having on U.S. industries. ANSI's conference is a follow-up to the 2006 NIST workshop where Taubitz spoke.

SOCMA Partnership With EPA. SOCMA's International Center for Sustainable Chemistry will support a variety of initiatives, including developing and evaluating strategies to help companies determine what makes one particular chemical better for the environment, or ''greener,'' than another and identify chemicals that may substitute for a problematic substance, according to Jim Cooper, the association's regulatory and government affairs manager.

The center was formed through a partnership between SOCMA and the Environmental Protection Agency, Cooper said.

SOCMA wants to use an approach for comparing chemicals that EPA developed in 2004 when it helped furniture manufacturers identify chemicals they could substitute for pentabrominated diphenyl ether (penta-BDE), which was phased out of production at the end of 2004 due to concerns about its persistence in the environment.

EPA developed a table that listed a wide variety of hazards that potential substitutes could pose; whether the alternatives ranked low, medium, or high in each hazard; and whether that conclusion was based on actual data from a test or estimated from available information.

The concept of comparing chemicals based on functional information as well as hazard appealed to all of the industry representatives BNA interviewed.

Too often companies find themselves seeking an alternative for a chemical that has been put on a list of ''chemicals of concern,'' Taubitz said. A list-based approach, however, does not acknowledge that a substitute chemical may require more energy in its manufacture or use or have other harmful effects, he said.

Elements of a Strategy. Some tools that could be part of a national strategy include chemical leasing and chemical management services, Michael P. Wilson, an assistant research scientist at the University of California at Berkeley's Center for Occupational and Environmental Health, said.

Chemical leasing refers to a contractual relationship between a chemical manufacturer and its customers. Instead of being paid based on the volume of chemicals purchased, the chemical manufacturer leases the chemical to its customer and gets paid based on agreed terms, such as the number of automobiles painted (28 CRR 497, 5/3/04).

The Dow Chemical Co. has developed a chemical leasing program called SAFECHEM, which provides chemical products, services, and expertise. That program is helping customers use solvents with maximum efficiency and ensure that appropriate risk management policies are in place, said John Phillips, director of the company's global chemicals management policy. The program can be a risk management tool to support REACH implementation, he said.

Chemical management services refer to companies such as chemical manufacturers, waste haulers, or environmental engineering firms that purchase and deliver chemicals for another firm, maintain that firm's inventory, track material safety data sheets, implement process efficiency improvements, collect data for environmental monitoring and reporting, and manage waste collection and disposal operations.

The Department of Defense is considering using chemical management service providers at some of its

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facilities, according to information the Defense Supply Center Richmond, in Virginia, posted on its website in March.

Jill Kauffmann Johnson, executive director of Chemical Strategies Partnership, said it costs companies on average $1 to $3, sometimes as much as $8, to manage every dollar's worth of a chemical they purchase. The partnership is a nonprofit organization that seeks to reduce chemical use, waste, and risk by working on supply chain issues.

Reducing the use of chemicals that generate hazardous waste, improving applications of chemicals, and other strategies fostered by chemical management services reduce the cost of managing chemicals 30 percent to 60 percent over five years, she said. ''It's really significant.''

While useful, both chemical leasing and chemical management services can only be used by certain types or sizes of companies, meaning their use does not replace more fundamental reforms that are needed in U.S. chemical policies, Wilson said.

Standardized Approaches Said Needed. Another key element is to have standardized methods that companies can use to identify alternative chemicals, Kirschner said.

Joel Tickner, a professor who helps run the Lowell Center for Sustainable Production at the University of Massachusetts, agreed that standardized tools and approaches are needed.

Members of a business-to-business council created by the center about 18 months ago are frustrated because products they design to be environmentally preferable have to be examined by up to six labeling programs before receiving labels indicating they have certain environmentally protective characteristics, he said.

Greater acceptance of labels offered through some partnerships managed by the Environmental Protection Agency's Design for the Environment Program could help reduce the number of ''eco-labels'' that firms must get to qualify for certain state or other environmentally preferable purchasing policies, Tickner said. Eco-labels show that a product has gone through some kind of independent review that determined the item has environmentally desirable characteristics such as being organic, having no volatile organic compounds, or being phosphate free.

EPA's program also needs more support, he said, referring to a letter council members such as SC Johnson & Son and the Hewlett-Packard Co., along with environmental organizations, signed in February. The letter to EPA Administrator Stephen Johnson urged increased support for EPA's Design for the Environment Program. Copies of the letter were sent to more than a dozen senators and representatives.

That program, the Feb. 1 letter said, ''is uniquely suited to help accelerate progress in sustainability by working with industry sectors including chemical manufacturers, formulators, and chemical users—a huge segment of industry.''

Yet another part of the idea of a national strategy on emerging chemical issues, said Kirschner, is to bring together disparate groups before legislation or other policies are on the table because once legislation has been introduced, these groups will be focused on their own agendas.

Idea Called Intriguing, but Concerns Voiced. William Greggs, associate director of product safety and regulatory affairs at the Procter & Gamble Co., said the idea of a national strategy to address emerging chemical issues is intriguing. ''It would be great to have a thoughtful forum for discussion,'' he said.

''But who would lead a forum like that, and who would follow through'' on the ideas discussed at such a forum, he asked.

He also questioned whether a national strategy could prevent the emergence of municipal, county, and state chemical policies. While sharing some of the concerns voiced by Kirschner and Taubitz, Ernie Rosenberg, president of the Soap and Detergent Association, was skeptical that a national strategy on emerging chemical issues would solve manufacturers' problems.

It may not be possible to figure out which chemicals will be targeted by environmental organizations, he said.

Further, companies selling and buying chemicals will always be reluctant to tell each other too much about what they are making, Rosenberg said.

''If I tell my supplier what is in my product, what's to stop him from making it?'' he said. ''There are valid reasons for protecting information—including toxicity information—which has value.''

Each type of downstream user has different needs, making it difficult for a single strategy to address everyone's concerns, Rosenberg said, voicing a perspective shared by Michael Walls, managing director for regulatory and technical affairs at the American Chemistry Council, which represents major U.S. chemical manufacturers.

Unclear What Problem Is Being Solved. While sympathetic to manufacturers feeling that their uses of chemicals are under assault, Walls said, ''It seems clear to me that there is no consensus on what problem such a national strategy would be designed to solve.''

The American Chemistry Council has analyzed the Toxic Substances Control Act and found no fundamental problems with the law, he said.

To the extent people want more information about chemicals, they should be pleased by the results of the High Production Volume (HPV) Chemical Challenge program, he said.

Under the HPV program, chemical manufacturers have volunteered to submit test plans to EPA that describe data they already have on chemicals they produce in large volumes and data they plan to generate (31 CRR 269, 3/19/07).

EPA is receiving information on about 1,400 industrial chemicals made in volumes of 1 million pounds or more, and the same information also is being provided for about 900 additional high production volume chemicals through an initiative under the Organization for Economic Cooperation and Development (30 CRR 1303, 12/18/06).

Walls said all of the information, which covers 95 percent of the chemicals in commerce by volume, is being made publicly available.

Walls agreed with Kirschner and Taubitz that chemical manufacturers and their customers need to improve the flow of information.

However, the ways divergent industries may use the same chemical means so many different questions may

need to be addressed that a single national strategy may not be the most effective approach, he said.

Regarding their desire for a standard approach to selecting chemicals that could substitute for one being eliminated in a product, Walls said: ''There is no standard approach to identify alternatives.''

''You can't just substitute one chemical for another without understanding the [product-specific] impact of that substitution,'' Walls said. The idea of substitution is imbedded in the EU's REACH legislation but will be far more difficult to accomplish than people realize, he said.

''I'm not convinced, at this point, that a national strategy is the way to go, but the concept hasn't been fully defined,'' Walls said.

Nike Says Firms Need Multinational Policies. John Frazier, director of considered chemistry, environment, safety, and health at Nike, said the idea of a national strategy on emerging chemical issues has merit.

But, ''given the nature of global supply chains, a more comprehensive multinational approach may be much more valuable,'' he said.

Frazier stressed how important it is for manufacturers to have their own multinational policies addressing the chemicals they use and the health and environmental implications of those substances.

''That would mean companies could spend less time tracking various legislation and spend more time communicating a single strategy to their supply team,'' Frazier said.

Nike has developed its considered chemistry program, which works on waste reduction, toxics reduction, and environmentally preferred materials and design, he said. As part of the program, Frazier said Nike has developed a list of chemicals that cannot be used in its products, and it guarantees that prohibition through contracts with suppliers.

The hazardous properties of chemicals are simply not valued on an equal footing with function, price, and performance in the market.

MICHAEL P. WILSON, UNIVERSITY OF CALIFORNIA AT BERKELEY'S CENTER FOR OCCUPATIONAL AND ENVIRONMENTAL HEALTH

''In addition, we also work with select suppliers to improve their current formulations,'' Frazier said, citing a new type of rubber developed for Nike that he said contains 96 percent fewer hazardous chemicals by weight.

Companies like Nike and firms in California's Silicon Valley are spending a lot of time and money to address chemical issues, said Wilson of Berkeley's Center for Occupational and Environmental Health. Wilson is the chief author of the 2006 University of California chemicals policy report to the California Legislature (30 CRR 1304, 12/18/06).

In the wake of RoHS, some electronics firms have hired their own chemists to identify and screen the chemicals they use in their products, he added.

The central message coming from large manufacturers, state and municipal agencies, and even the local auto repair shop is that there is inadequate information about the toxicity and ecotoxicity of chemicals they buy, he said.

Market Demanding More Information. Efforts by leading companies like Kaiser Permanente and others illustrate that the market is beginning to demand better information about chemicals, Wilson said.

States, too, are beginning to translate their needs into legislation, he said, pointing to legislation that committees in California's Senate and Assembly have passed that would require the disclosure of hazard and other information on chemicals produced in high volumes and the reduction in the use of chemicals deemed to be toxic.

The data gap on chemicals that companies and state agencies face has resulted from long-standing weaknesses in U.S. chemical policies, he said.

The Toxic Substances Control Act makes it difficult for EPA to obtain basic information about chemicals or to control those of greatest concern, Wilson continued.

In addition, the law's presumption that ''existing chemicals'' (those in commercial use in the United States in 1979) are ''safe until proven otherwise'' by EPA encourages their continued use and discourages the development of new chemicals that could be designed to be less harmful to the environment and people, Wilson said.

According to ACC's Walls, the problem is not a lack of innovation by the U.S. chemical industry. ''We have three times more new chemical applications being reviewed by EPA than any other country in the world'' has under review by their authorities, Walls said, adding that one out of every eight U.S. patents relates to chemistry.

But those innovations are mostly focused on improvements in the function, price, or performance of chemicals, not on their human health or environmental effects, Wilson said.

The hazardous properties of chemicals are simply not valued on an equal footing with function, price, and performance in the market, Wilson added. ''[T]his explains why you can earn a Ph.D. in chemistry in universities across the U.S. without demonstrating even a rudimentary understanding of toxicology; we are training our chemists to work in the current market.''

Of the 200,000 chemists working in the United States, only a few hundred have been required to study toxicology, according to a documentary, ''Nontoxic Business,'' released by Dolphin Safe Source in March. Headquartered in Lake Oswego, Ore., Dolphin Safe Source is a company that helps Fortune 500 firms better manage their diverse chemical inventories.

''If we get the market signals right by crafting policies that have the effect of placing the hazardous properties of chemicals on an equal footing with their function, price, and performance, the chemical industry will begin to employ its talent and resources in a core way to safer chemicals as a core function, not simply as an 'add-on,' '' Wilson said. ''In a properly functioning market, the industry would move continually toward innovating safer chemical substances,'' he said.

U.S. Becoming Dumping Ground. A new strategy also must address a growing problem occurring in the United States as other countries adopt new chemicals

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Resources

- For more information about ANSI's August meeting, contact Stacy Leistner by e-mail: sleistne@ansi.org;
- Information about SOCMA's Sustainability Center is available at http://www.socma.com/PDFfiles/NewsReleases/Intl_Center_for_Sustainable_Chem.pdf;
- Information about EPA's Design for the Environment Program can be found at http://www.epa.gov/dfe;
- Information about the Green Chemistry and Commerce Council is available at http://www.chemicalspolicy.org/downloads/GC3factsheet022707.pdf;
- The Green Screen for Safer Chemicals database can be downloaded at http://www.cleanproduction.org/Home.php;
- The CleanGredients database is available at http://www.cleangredients.org/home; and
- Information about Dolphin Safe Source's chemical management software is available at http://www.dolphinsafesource.com.

policies, according to Wilson and Stacy Malkan, director of Health Care Without Harm's U.S. and Canadian press outreach.

As Europe and even China pass laws banning certain chemicals from products, America is becoming a dumping ground for products that are no longer permitted for sale in those regions, they said.

For example, they both pointed to emissions standards adopted by the European Union, Japan, and China to reduce the amount of formaldehyde released by pressed wood products used in homes and office cabinets and furniture. Formaldehyde is classified by the National Toxicology Program as a reasonably anticipated human carcinogen.

The allowable emissions in these regions are so low that formaldehyde-based materials cannot be sold there, Malkan said. However, these materials continue to be sold in the United States, she said.

Bans Said to Be Without Cause. Responding to claims that chemical policies in the United States are less-protective than those in other countries because it has not banned certain chemicals or uses of chemicals, Cooper and Rosenberg said substances are being banned even though they are not causing any harmful effects.

In many cases the United States has not banned a chemical, or a particular use of a chemical, because risk analyses showed it would not cause harm at the exposure level people would experience, Cooper said.

Rosenberg said the question should not be whether a chemical potentially poses a risk, but whether harm is likely from this chemical in this product.

''If the answer is no, go after a chemical where the answer is yes,'' he said.

Public Disclosure Up, Down Supply Chains. According to Wilson, the most important aspect of any national strategy on emerging chemical issues would be policies that require and encourage the sharing and public disclosure of chemical information up and down the supply chains, along with incentives for firms to use safer chemicals, thereby increasing the market demand for them.

To some extent, such incentives already exist, Wilson said, pointing to research on the costs of managing chemicals. ''[B]ut firms are mostly unable to act on these incentives because chemical information, including on safer alternatives, is so sparse,'' he said.

Role of Investors. Investors also would play an important role in a national strategy on emerging chemical issues, said the Investor Environmental Health Network's Liroff.

A growing number of reports from investment groups including his network are calling attention to the financial risks companies face in terms of markets lost when they use toxic chemicals, he said.

''We are rapidly approaching a tipping point where conventional chemical manufacturers have to move beyond a knee-jerk defense of existing chemicals and their market share to a demonstrated large-scale commitment to greener chemistries that both governments and major private sector players are increasingly requiring,'' Liroff said.

Wilson agreed. The United States is approaching a point that will motivate change in the country's chemical policies, he said. Such a shift has already occurred on climate change, which is now being taken more seriously by companies as well as the general public, he said.

''It's a short step from developing a climate change policy to developing a new chemicals policy,'' he said. ''Both provide opportunities to address a worsening set of problems in ways that could open new opportunities for investment, employment, and innovation in the economy, all of which resonates with smart policymakers and business leaders.''

SOCMA's Cooper agreed that market demand has spurred his association to develop the sustainability center, which will strive to encourage the use of greener chemicals. But he stressed that firms should select chemicals based on their ability to perform needed functions and not solely on the basis of concerns about hazards they may pose.

The potential for a chemical—at some dose—to cause harm should not prevent its use at a far lower dose if that chemical has an important function, he said.

Tools to Identify Greener Chemicals. Lauren Heine, director of GreenBlue, an organization that seeks to spur the redesign of products to promote sustainability, hoped a variety of tools nongovernmental organizations are developing may be a step to aid that goal.

These include the Green Screen for Safer Chemicals developed by an organization called Clean Production, Green Product Selector™ software designed by Dolphin Safe Source, and the CleanGredients database her organization developed to help chemical formulators—companies that mix chemicals into products such as soap—identify better ingredients.

Procter & Gamble's Greggs said such tools can help small companies in particular, but the key message for companies is that they must have an internal process to make sure any product they sell is safe before it hits the market—independent of whatever the local regulations or laws are.

The Soap and Detergent Association's Rosenberg noted, ''We're not dealing with a system that has a pre-

dictable set of assumptions. When you don't know where the next challenge is coming from, it's hard to be prepared.

''This is a maze we have not yet figured out,'' he said.

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