FIDUCIARY GUIDE TO TOXIC CHEMICAL RISK

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Investor Environmental Health Network

The Investor Environmental Health Network (IEHN) is a collaborative partnership of institutional investors, advised by non-governmental organizations, concerned about the market and health risks associated with corporate toxics policies. It serves as an informational resource and secretariat for investors working to reduce portfolio risk related to toxics. **www.iehn.org**

Rose Foundation for Communities and the Environment

The Rose Foundation is a grantmaking public charity dedicated to nurturing positive intersections between the environment, the economy, and communities. Through its Environmental Fiduciary Project, the Foundation advocates the prudence of considering environmental and social factors in portfolio management. It serves as the fiscal sponsor of the IEHN. **www.rosefdn.org**

Table of Contents

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Executive Summary

Introduction and Overview

In July 2005, *The Wall Street Journal* published a front page story captioned "Common Industrial Chemicals in Tiny Doses Raise Health Issue"[1] and the next month *USA Today* published a lengthy feature story entitled "Are Our Products Our Enemy?"[2] These two articles represent the tip of an iceberg of growing scientific concern about the impact on human health of relatively small amounts of chemicals in everyday products.

Shareholders Speak, Companies Respond: Corporate Policy Initiatives Following the 2006 Proxy Season

- Whole Foods Markets announced that it would remove baby bottles and other products that contain certain toxics from its shelves as part of a new corporate policy initiative to reduce customers' exposure to hormone-disrupting chemicals.
- Wal-Mart announced a new "preferred substances policy" that incorporates a precautionary, hazards-based approach to chemicals management, initially focusing on persistent bioaccumulative toxics and carcinogens.
- ConAgra agreed to analyze and report on alternatives to PFOA in food packaging.
- Becton, Dickinson agreed to survey its suppliers regarding brominated flame retardants in its medical devices.
- Johnson & Johnson agreed to initiate a stakeholder dialogue with one of the cosmetics industry's harshest critics, the Campaign for Safe Cosmetics.

Researchers are increasingly detecting scores of these substances in human blood, breast milk, and amniotic fluid, and scientists are increasingly recognizing the particular vulnerability of fetuses and young children to them. These and related findings are contributing to rising awareness that the strategic choices businesses make about managing toxic chemicals in their products can have major financial consequences. As DuPont has been discovering from lawsuits and government enforcement actions surrounding its management of a toxic chemical used to produce Teflon®, toxic hazards can lead to sizeable financial and reputational damage.[3] Conversely, both General Electric's landmark Ecomagination[4] program and Wal-Mart's Smart Products Initiative[5] reflect the growing recognition that producing and marketing less toxic products provide significant business opportunities.

Companies' strategic choices in turn have implications for individuals, governments, and individual and institutional investors. Toxic exposures can impose costly burdens on both individual budgets and on government educational and health budgets. Poor corporate management of toxic hazards can increase risks for investors and burden share performance, while corporate efforts to minimize or avoid exposures, or to offer safer alternatives, can benefit corporate bottom lines and potentially reward investors.

This **Fiduciary Guide to Toxic Chemical Risk** examines the financial dimensions of toxic chemical risk – in products, in supply chains, and in many investors' portfolios. It explores how these risks may be quantified, and offers fiduciaries a policy framework to view these long-term (but often poorly understood) threats to shareholder value. It also highlights some of the emerging investment opportunities that inevitably arise when the power of the market dynamic is harnessed to move towards commercializing new technologies and increasing the efficiency of existing technologies. We also profile the growing wave of shareholder concern around toxic chemicals and associated financial liabilities, as well as responses by a broad spectrum of companies after the 2006 proxy season. While the companies that acted cited various reasons for adopting more health-protective policies, all acknowledged the role of shareholder dialogue in advancing the issue of toxics to the forefront of management's attention.

Finally, and perhaps most importantly, this Fiduciary Guide to Toxic Chemical Risk details a comprehensive set of immediate action steps that can be taken to translate the long-term threats and opportunities associated with toxic chemical issues into prudent portfolio stewardship. These steps include comprehensive directions that can help fiduciaries understand the relationship between toxics and financial risk, and guide their exploration of these issues with investment managers and consultants.

The Hidden Costs of Toxic Exposures

In Section One of this report, **The Hidden Costs of Toxic Exposures**, Tufts University researcher Rachel Massey reviews the estimated economic costs of chemical exposures. Even small exposures to neurotoxic, carcinogenic, and other toxic chemicals can impose sizeable costs. For example, the annual national costs of cancer in the United States are estimated by the National Institutes of Health to be $210 billion/year, and rising at 7% annually. Estimates of how much of these costs may be attributable to environmental factors vary widely and are often controversial. In recent years, researchers have begun to develop and refine more precise estimation metrics to measure the direct and indirect costs of preventable illnesses and disabilities associated with exposure to toxic chemicals.

While these studies are far from reflecting the full economic cost of these preventable tragedies to society, they provide some guidance by indicating a minimum figure above which those costs may lie. A national study estimated the direct and indirect environmentally attributable costs of selected illnesses and disabilities in American children at nearly $55 billion in 2002.[6] This estimate considers only a subset of environmentally attributable illnesses and disabilities and uses very conservative estimates of the percentage of illnesses and disabilities that are attributable to environmental factors. More recent studies have estimated costs of illness in individual states. One study estimated environmentally attributable costs of children's illnesses and disabilities in Massachusetts at $1.1 to $1.6 billion per year.[7] Another study estimated the costs of combined adult and childhood diseases and disabilities attributable to environmental contaminants in Washington state at about $2.7 billion.[8] A Minnesota study estimated costs of childhood diseases there at $1.5 billion per year.[9]

Massey extrapolates the results of existing research to provide ranges of estimates of environmentally attributable costs of cancer, asthma, and neurobehavioral disorders in Connecticut, California, and New York. For example, the annual cost of childhood asthma in New York is estimated at $154 million (within a range of $51 to $181 million) while the direct and indirect annual costs of childhood and adult cancer in California are estimated at $1.3 billion (within a range of $500 million to $2.5 billion). However, just as the recent media interest may only represent the tip of an iceberg of scientific concern about toxic chemicals, these cost estimates may only represent a fraction of the true drag that toxic chemicals place on our economy.

It is beyond the scope of this paper to evaluate toxic exposure costs in all 50 states, as well as the ripples that then flow throughout the economy. But these ripples include loss of business productivity, loss of consumer buying power, and possibly loss of adequate retirement savings. All of these may place severe macroeconomic strains on the U.S. economy, both now and for many years into the future as less dollars are available to companies—hindering expansion—and as increased illness strains the already-overburdened social security, Medicare, and private insurance social safety net. If we looked at the U.S. as a whole, the direct cost numbers would be frightening and the combined weight of the indirect costs would be staggering. But our nation's current systems of economic analysis are largely not geared towards capturing these costs. Therefore, instead of being managed, toxics-related costs act as an unrecognized, but very real and consistent brake on American economic productivity.

Risks to Shareholder Value

In Section Two, **Risks to Shareholder Value from Corporate Toxic Chemicals Policies,** Richard A. Liroff, founder and director of the Investor Environmental Health Network, and Tim Little, Executive Director of the Rose Foundation, profile examples of specific costs and/or implications for shareholder value from companies' toxic footprints. As a result of emerging science, concern is growing about toxic exposures, and the related financial exposures associated with toxic chemicals in products. Scientists historically have been fond of saying that "the dose makes the poison," but they are increasingly recognizing instead that "the dose and the timing make the poison." The human fetus undergoes a dramatic transformation during its nine months in the womb, developing a brain and nervous system, reproductive organs, an immune system, and myriad other systems and parts. The entire process is driven by minute amounts of chemicals delivering developmental messages at just the right place and just the right time. It doesn't take much of a foreign chemical at the wrong place at the wrong time to foul up the process, potentially causing learning and developmental disabilities, organ damage, and possibly increased susceptibility to health problems later in life.

The exquisite sensitivity of fetal development to toxic intruders has been summarized by biologist Dr. Sandra Steingraber this way: "Exposures that produce only transient effects in adult brains can lay waste to fetal ones."[10] Likewise, a newspaper advertisement organized by faculty at the Center for Children's Health and the Environment at Mount Sinai School of Medicine in New York City is captioned: "Johnny can't read, sit still, or stop hitting the neighbor's kid. Why? Toxic chemicals can cause learning disabilities."[11] Still other scientists, noting trends and relationships between testicular cancer, undescended testicles, a birth defect called hypospadias (where the penis opens along its length, not at the end of its shaft), and lowered sperm quality, have pointed to exposures to toxic chemicals as a possible underlying cause for this group of health effects that they label "testicular dysgenesis syndrome." [12]

The growth of scientific interest in exposures to common chemicals is illustrated by the recent exponential surge in studies of brominated flame retardants.[13] Some of these are linked in animal studies to immune suppression, cancer, hormone disruption, and neurobehavioral and developmental effects.[14] Levels in humans are now close to the levels shown to have undesirable health effects in animals. Based on such research, some brominated flame retardants (penta- and octa-brominated diphenyl ether) have been outlawed in the European Union, California and other states, and are outlawed in a multitude of private and public sector environmentally preferable purchasing programs. These bans, in turn, carry significant economic consequences and force a number of business choices. For example, a company whose products include these flame retardants (which are used in a wide range of consumer products such as computers, mattresses, foam, and textiles), must either reformulate, or exit the 457-million-person marketplace of the European Union as well as lose access to the world's 8th largest economy in California. Loss of access to major markets is likely to have material negative effects on shareholder value for companies that face these "toxic lockouts."

A similar pattern of escalating scientific interest is apparent for two perfluorinated chemicals, PFOS (perflourooctanyl sulfate) and PFOA (perfluorooctanoic acid), showing that the brominated flame retardant bans are not isolated market factors, but part of an emerging pattern.[15] Until 2000, PFOS was used by 3M in the manufacture of Scotchgard®; 3M pulled the product from the marketplace and reformulated it in response to growing scientific evidence about buildup of PFOS in the environment. PFOA is a chemical used to make stain and grease resistant coatings for consumer products such as carpets, textiles, and food packaging and is perhaps best known for its use in the manufacture of Teflon®. Animal and human studies have found a likely association of PFOA with a wide array of health harms, ranging from elevated cholesterol, to liver damage, birth defects, and cancer. Correspondingly, its manufacturer, DuPont, has been assessed the largest fine ever issued by the US Environmental Protection Agency, plus a $100 million private settlement of contamination charges, and faces a $5 billion consumer class action lawsuit.

At some point, these liabilities assume material proportions. As stock price is negatively impacted, shareholders may be expected to file their own actions. Perhaps more speculatively, but worth fiduciary consideration, is how beneficiaries might react. If a fund suffers a series of toxics-related loses, will we begin to see beneficiary-driven actions to hold their trustees and management accountable for lack of investment policies designed to identify and control portfolio risk stemming from toxic liabilities?

In fact, it may be that investors or trustees should not hold an image of icebergs in mind when considering the financial risks of toxics. After all, an iceberg may be identified on radar and avoided. The growing waves of scientific interest in toxic chemicals may perhaps be better likened to tsunamis poised to strike vulnerable companies and their shareholders. In such cases, the window of opportunity may be extremely limited for companies, shareholders, and anyone else in a fiduciary position to move to financial higher ground. Just as incredibly small doses of toxic chemicals may poison a fetus, seemingly small amounts of toxic risk can poison a portfolio. However, with careful planning and deliberate engagement designed to reduce toxic threats, companies and portfolios may safely ride out the storm.

Liroff and Little provide examples of both positive and negative consequences to business stemming from chemical exposure issues. The negative examples include an immediate 22% drop in Sherwin Williams' stock price related to news of an adverse jury verdict in a lead poisoning case in Rhode Island. Liroff and Little also profile companies that are gaining business share through astute "clean & green" positioning and marketing strategies. One such firm is C&A Floorcoverings, Inc., which has produced a new line of PVC-free carpets to answer health care giant Kaiser Permanente's call for green building products for its network of 30 hospitals and 431 medical buildings.

Toxic Chemical Risk & Fiduciary Duty

In Section Three, **Toxic Chemical Risk and Fiduciary Duty**, attorney Jonas Kron, an expert in fiduciary and shareholder law who serves as a U.S.-based consultant for the international law firm Freshfields Bruckhaus Deringer, summarizes the body of fiduciary law that permits fiduciaries to evaluate and respond to toxic threats as important environmental factors which may also have major social and governance dimensions (collectively referred to by Freshfields as ESG factors). Kron points out that some of the largest law firms in the world have definitively concluded that considering environmental, social and governance issues is at the core of the fiduciary Duty of Prudence, and he argues that it follows that fiduciaries have an affirmative duty to consider toxic chemical issues that impact corporate risk, return and shareholder value.

In particular, Kron highlights the need for fiduciaries to fully consider shareholder resolutions implicating environmental health risk as part of their overarching Duty to Monitor. Kron examines one of the cutting edge questions before institutional fiduciaries today—do they face an affirmative obligation to engage portfolio companies on toxics issues? Looking to the long-term nature of most institutional portfolios, Kron concludes the safe fiduciary course is to recognize that it may be prudent for portfolio companies to assume some level of short-term expense to address toxics issues, if these short-term expenditures position the company to increase the likelihood of maintaining long-term value through reduced liabilities or increased sustainability. He speculates that beneficiaries may well question future fiduciaries who do not act in the face of known or suspected product or historical toxic liabilities that threaten shareholder value, and closes by profiling how leading institutional investors and advisors are positioning themselves to respond to the toxic threat. This often includes revising their proxy voting guidelines to specifically address toxics issues and engaging portfolio companies on toxics issues.

A Road Map for Fiduciaries

We close with Section Four, **Addressing Toxic Chemicals: A Road Map for Fiduciaries**, in which Jane Ambachtsheer of Mercer Investment Consulting provides a comprehensive outline for fiduciary action to protect portfolio value from toxic threats. The roadmap is a comprehensive set of directions to guide investors in assessing and documenting their own understanding of the relationship between toxics and financial risk, and exploring these issues with investment managers and consultants. The section closes with a suggested series of steps to manage risk exposure and protect investment portfolios. Associated appendices outline the growing wave of recent shareholder activity on toxics issues, and provide a sample engagement letter that could be sent to selected portfolio companies.

1 The Hidden Costs of Toxic Exposures

by Rachel Massey

Rachel Massey is a researcher at the Global Development and Environment Institute at Tufts University, where she has helped to build a program in Economics for Health and the Environment. Her recent work has included a series of studies of the economic implications of the proposed new European chemicals policy, REACH.

A Sampling of Chemicals of Concern

Mercury is an example of a chemical that is used in products and often released into the environment at the end of a product's useful life. In addition to the mercury releases through industrial operations such as coal fired power plants, the mercury in thermometers, blood pressure gauges, lights, switches, and other products can enter air and water when those products are discarded. Incineration of mercury-containing products releases mercury into the air. Eventually the mercury enters water sources, where it is taken up by aquatic organisms, concentrated as it rises through the food chain, and ultimately ingested by people when they eat fish. Mercury-containing products in landfills can also contaminate air and water.[16]

Brominated flame retardants, especially polybrominated diphenyl ethers (PBDEs) are used as flame retardants in furniture, sofas, mattresses, and many electronic products, among other products. Levels of PBDEs in the breast milk of American women are high and rising rapidly.[17] One study found that the levels of PBDEs in American women's breast milk are 10 to 100 times greater than human tissue levels in Europe.[18] PBDEs are persistent and bioaccumulative and are associated with disrupting thyroid function, among other problems. PBDEs, like phthalates, are not chemically bound to the material; thus, they can easily leach out of the material to which they have been added. PBDEs used in computers are released gradually from the plastic casing of the computers, and contaminate indoor dust; a study of dust on computers found significant levels of PBDEs in every sample.[19]

Phthalates are another high-profile set of chemicals.[20] They are used as plasticizers in a range of plastic products. Phthalates are not chemically bound to the plastic, and they can leach out of the product gradually over time. Children are exposed to phthalate plasticizers when they put phthalate-containing toys in their mouths; patients are exposed when they are treated using phthalate-containing medical devices in the hospital; and phthalates can off-gas from plastic flooring materials, leading to respiratory exposures. The European Union has placed limits on phthalates in children's toys, and large health systems in the United States have placed restrictions on their use.

When we think of toxic exposures, we generally think of industrial pollutants that enter our air, water, or soil. However, a large portion of our toxic exposures actually come from products—ranging from cars to computers, from furniture to toys. People can be exposed to toxic chemicals in products either during the useful life of the product or at the point of disposal. Toxic chemical exposures are associated with a range of illnesses and disabilities, including cancer, asthma, neurobehavioral disorders, reproductive disorders, and birth defects. Illnesses and disabilities, in turn, create economic costs. Some of these costs fall upon individual families; others are borne by insurance companies, state and local education systems, state health care systems, and other institutions.

Fetal, infant and childhood exposures to toxic chemicals in products are of particular concern. Babies and children eat more food, drink more water, and breathe more air per unit of body weight compared with adults, increasing their vulnerability and exposure to contaminants. Babies and children spend significant amounts of time indoors, play on the floor, and put objects in their mouths; all these behaviors can increase their exposure to toxic chemicals in the home. Their rapidly developing organ systems are highly vulnerable to damage. A toxic exposure during a critical window of developmental vulnerability can result in life-long disability or disease. In addition to the human suffering they cause, toxic exposures early in life can result in enormous economic costs over a period of decades. These costs can include the need for special education and on-going medical care, as well as reduced earnings.

Calculating the Costs of Environmentally Attributable Illnesses

Illnesses and disabilities associated with toxic exposures produce both direct and indirect costs. Direct costs include costs of hospital care, drugs, physician visits, and other costs of medical treatment. Indirect costs include foregone future income, special education costs, and costs of institutional and special care at home. In order to estimate the cost of environmentally attributable diseases and disabilities, it is necessary to estimate what portion of diseases and disabilities are attributable to environmental exposures.

The concept of the "environmentally attributable fraction" (EAF) was first developed by the Institute of Medicine (1981) and has been used in a number of studies over the past twenty-five years.[21] The field continues to evolve. The World Health Organization (WHO) recently produced a report that attempts to quantify the environmentally attributable fraction for a wide range of diseases and disabilities.[22] The following analysis does not rely on the WHO figures for its calculations, although WHO's estimates represent an important new step in the ongoing effort to define the environmentally attributable fraction of disease and disability. The WHO defines "environment" as "all the physical, chemical, and biological factors external to the human host, and all the related behaviors, but excluding those natural environments that cannot reasonably be modified." The WHO excludes smoking and diet from its working definition of environmental factors.[23] Using this definition, the WHO estimates that environmental factors are responsible for about 19% of cancers worldwide (range: 12-29%), or 1.3 million deaths each year. WHO also estimates that environmental factors are responsible for 44% of the total disease burden from asthma (range: 26-53%), 5% of birth defects (range: 2-10%), and 13% of neuropsychiatric disorders (range: 10-16%).[24] Other studies have used somewhat different lenses to examine the issue. For example, a project to assess the role of the environment in the global burden of disease worldwide defined "attributable environmental risk" as "the percentage of a particular disease category that would be eliminated if environmental risk factors were reduced to their lowest feasible concentrations."[25]

As outlined in the box on page 9, "Calculation Models for Environmentally Attributable Costs of Illness," this paper builds on methodology developed by Dr. Philip Landrigan of the Mount Sinai School of Medicine.Many diseases and disabilities are not considered in the illustrative discussion in this paper. Therefore this paper should by no means be considered an exhaustive accounting of environmentally attributable costs in the three states selected for state-specific calculations. In particular, due to the limited scope of this project, the discussion does not include calculations for cardiovascular disease, asthma in adults, or birth defects.[26] Therefore, the environmentally attributable costs cited do not represent comprehensive estimates of the true financial burden of toxic exposures. Rather, we point out that it is possible to estimate these costs, and that even limited estimation shows that they are significant. These calculations also do not distinguish the cost consequences of exposures to toxicants in products from exposures associated with ambient environmental exposures. Developing metrics for such a calculation might be of interest to a shareholder who wanted to evaluate potential embedded portfolio risk stemming from investments in companies that use or release significant amounts of toxics. That said, a concerted effort to reduce toxicants in products has the potential to produce both health and economic benefits throughout the product life cycle. These reductions may also correspondingly reduce a company's risk profile, which may be reflected in reduced beta and increased shareholder value.

Categories of Environmentally Attributable Costs

Direct costs of medical treatment. Costs in this category can include costs of medications, doctor visits, physical therapy, special equipment such as braces or crutches, and costs of hospitalization.

Lost work and school time. Illnesses lead to work days missed. In addition, when children become ill and miss days of school, this often translates into lost work days for parents.

Special education. Increasing numbers of children receive special education services, which require high teacher-to-student ratios and cost substantially more per child than other schooling.

Home and institutional care. People with illnesses and developmental disabilities often require special care, either at home or at an institution. Care at home may be provided by a paid caretaker or by a family member; in the latter case, the time spent at home may translate into foregone earnings.

Foregone future earnings. Toxic exposures in childhood can lead to decreased productivity and decreased income in adulthood. For example, lead exposure in childhood decreases IQ, and radiation therapy for childhood brain cancer can produce serious learning disabilities.

Calculation Models for Environmentally Attributable Costs of Illness

Several recent studies serve as models and reference points for the information presented in this section. In particular, the present discussion draws heavily on analyses completed by Landrigan et al. (2002), Massey and Ackerman (2003), and Davies (2005).

Philip Landrigan of the Mount Sinai School of Medicine assembled a team to look at the costs of children's asthma, cancer, and neurobehavioral disorders. The Landrigan group worked with a panel of experts in each field to estimate environmentally attributable fractions (EAFs) for these categories of children's illnesses. The group defined the EAF as referring only to the effects of "chemical pollutants in the ambient environment," and not to include exposures that result largely from individual choices such as "tobacco, alcohol, or drug abuse."[27]

- For children's asthma, the Landrigan team estimated that environmental exposures are responsible for between 10% and 35% of all cases of children's asthma.
- For children's cancers, the Landrigan team chose hypothetical EAFs of 2%, 5%, and 10%. The panel of experts assembled for the project had difficulty defining an actual EAF for children's cancers. They agreed that the EAF would be "at least 5-10% and less than 80-90%, but could not further refine that broad range." Given this uncertainty, the Landrigan team simply used the most conservative assumptions possible, working with figures at the low end of the range considered by the panel.
- The team divided children's neurobehavioral disorders into those caused by lead exposures, which are 100% attributable to environmental factors, and those caused by all other factors. The estimated EAF for neurobehavioral disorders other than those caused by lead exposure, based on a study by the National Academy of Sciences, is estimated to range from 5% to 20%, with a "best guess" of about 10%.

Massey and Ackerman (2003) applied the EAFs developed by Landrigan et al. to estimate costs of children's illnesses in Massachusetts and to develop a state-specific estimate of the avoidable costs of environmentally attributable illnesses among children. Massey and Ackerman estimated that the environmentally attributable costs of the illnesses and disabilities considered by Landrigan et al. added up to about $1.1 to $1.6 billion per year in Massachusetts. Massey and Ackerman also looked at costs of birth defects in Massachusetts, but did not apply an EAF to these figures.

Davies (2005) developed a state-specific estimate of the economic costs of environmentally attributable illnesses and disabilities in the state of Washington. The study found that "the best estimate of the annual cost of combined adult/childhood diseases and disabilities attributable to environmental contaminants (asthma, cardiovascular disease, cancer, lead exposure, birth defects, and neurobehavioral effects) in Washington State is about $2,734 million, comprising $782 million in direct health care costs and $1,953 million in indirect costs. The range of costs is $2,800 million to $3,500 million a year, depending on the methods and assumptions used." Davies pointed out that her estimate of the cost of environmentally attributable diseases and disabilities adds up to about 1% of Washington's total Gross State Product. It is also about the same as the total contribution of the biotechnology industry to the state economy each year.[28]

Costs of Neurobehavioral Disorders

A range of toxic exposures can produce neurobehavioral disorders. Fetuses, infants, and children are uniquely vulnerable to toxic exposures, in part because their organ systems are developing rapidly. Toxic exposures during key "windows" of developmental vulnerability can produce permanent damage. The developing brain is particularly vulnerable to damage from toxic exposures.

Evidence both from the laboratory and from epidemiological studies shows links between toxic chemicals and a variety of developmental disabilities, including autism. According to a 2000 review by Greater Boston Physicians for Social Responsibility, important developmental neurotoxicants include lead, mercury, cadmium, manganese, nicotine, pesticides such as organophosphates, dioxin, PCBs, and solvents.[29]

Some sources of neurobehavioral disorders include the following:

- **Lead exposure during fetal development, in infancy, or during childhood** can produce irreversible, life-long brain damage. Lead exposure in children often results from exposure to lead paint, which is still common in urban environments, and from exposure to lead that still remains in soil due to years of leaded gasoline use. Children can also be exposed to lead through products; for example, some toy jewelry contains high lead levels, and lead is used as a stabilizer in some rigid PVC plastic products.

- **Mercury is a major source of neurodevelopmental damage in fetuses**, infants, and children.

- **Brominated flame retardants can interfere with proper thyroid function**, which can also lead to developmental problems.

- **Fetal exposure to organic solvents**, such as toluene, can produce brain damage.

Excluding costs specific to lead exposure, Landrigan and his team estimated the national cost of three children's neurobehavioral disorders—mental retardation, autism, and cerebral palsy—at $114 billion in 2006 dollars, before calculation of the EAF.[30] A study by the National Heart, Blood, and Lung Institute (NHLBI) developed an estimate that includes effects on adults and a larger number of disorders (including those resulting from lead exposure). NHLBI calculated an annual cost of these "diseases of the nervous system" at nearly $168 billion.[31]

Selected Neurobehavioral Cost Studies

A significant percentage of women of childbearing age in the United States have blood mercury levels high enough to cause neurological damage in the developing fetus.[32] There is no known "safe" threshold for mercury exposure. In 2005, Trasande et al.[33] investigated the costs of illness and disability resulting from mercury exposure. The authors note that exposures result primarily from pregnant women's consumption of seafood contaminated with mercury. About 70% of this contamination results from anthropogenic (man-made) sources. The authors found that between about 317,000 and about 637,000 babies per year are born with cord blood mercury levels associated with loss of IQ. This IQ loss translates into lost productivity over the entire life of these children. The authors estimate the cost of this lost productivity at $8.7 billion annually in 2000 dollars, with a range from $2.2 to $43.8 billion. Of this amount, $1.3 billion is attributable specifically to coal-fired power plants located within the US. Incinerators burning mercury-containing products historically have been additional significant sources of mercury.

Other recent studies have considered an even wider range of social costs associated with childhood **lead poisoning**. In addition to infant mortality, health care costs, special education, and foregone future income, these studies have also looked at the costs associated with lead exposure in the juvenile justice system, as well as the costs to the state of providing public education about lead.[34] Increased costs for special education are another component of the costs of neurobehavioral disorders and the overall costs of special education are on the rise. The budget for special education in California rose from $3.71 billion in 2001-02 to $4.35 billion in 2005-06.[35]

Costs of Cancer

The American Cancer Society estimates that 1.4 million Americans will be diagnosed with cancer annually and 564,830 will die of the disease this year. Cancer is responsible for about one in four deaths in the United States, second only to heart disease. The National Cancer Institute estimated costs of cancer in 2005 alone at $209.9 billion: $74 billion for direct medical costs, $17.5 billion for productivity lost due to illness, and $118.4 billion in costs of lost productivity due to premature death.[36]

Four types of cancer—breast, prostate, lung, and colorectal—were in the top twenty most costly conditions according to the 2000-2001 Medical Expenditure Panel Survey. These four conditions cost patients, insurance firms, and Medicare $13.4 billion.

The national costs of cancer were around $205 billion (in 2006 dollars) in 2003, according to figures from the National Heart, Lung and Blood Institute.[37] Slightly more than a third of this estimated cost consists of direct medical treatment costs. These figures also include estimates of lost productivity due to absence from work and lost productivity due to premature mortality.

Costs of Toxic-Related Illnesses in Three States

This section presents illustrative calculations of the costs (in 2006 dollars) of selected illnesses due to toxic exposures in California, Connecticut, and New York.[38] We use national estimates to derive estimates of disease costs at the state level, based on population percentages. California has 12.2% of the U.S. population, New York 6.5%, and Connecticut 1.2%. We then apply an environmentally attributable fraction (EAF) consistent with the EAFs used by Landrigan and his team in their 2002 study. These are 30% for asthma (range: 10-35%); 5% for cancer (range: 2-10%); 10% for neurobehavioral disorders not caused by lead exposure (range: 5-20%); and 100% for neurobehavioral disorders caused by lead exposure. It is worth noting that the estimated 5% EAF for cancer is very conservative.[39] Applying a larger environmentally attributable fraction would, of course, increase these numbers significantly.

An estimation exercise of this kind necessarily requires many assumptions. Therefore, we report the range of estimates while still attempting to provide an order-of-magnitude sense of the costs that result from toxic exposures. These figures do not reflect possible differences in levels of toxic exposures across states. But our goal in this discussion is not to produce a complete assessment of the environmentally attributable costs of these and other illnesses in these states, nor do we suggest a "silver bullet" analytical method that accurately captures all costs across all possible scenarios. Rather, we illustrate one reasonable approach to estimating these costs. These costs can impose a significant burden on state and local government budgets, as well as governmental and private and health benefit plans. These costs are particularly material information for pension funds concerned with the health and retirement security of their beneficiaries. The cost projections offered in this paper may be considered very conservative and represent more or less "threshold numbers" —a foundation on which fiduciaries and other investors can rest in assessing risk rather than a ceiling expressing maximum risk exposure.

Annual Economic Costs of Selected Human Health Disorders In California, Connecticut, and New York (in millions of 2006 dollars)*

Disease	California	Connecticut	New York	Totals (by disease)
Childhood Asthma	$289 (range: $96 - $338)	$28 (range: $9 - $33)	$154 (range: $51 - $181)	**$471**
Childhood and Adult Cancers	$1,260 (range: $503 - $2,510)	$122 (range: $49 - $244)	$670 (range: $268 - $1,340)	**$2,052**
Neurobehavioral Disorders (non-lead)	$1,390 (range: $700 - $2,780)	$140 (range: $70 - $270)	$740 (range: $370 - $1,480)	**$2,270**
Neurobehavioral Disorders (lead-only)	$6,560	$637	$3,500	**$10,697**
Totals (by state)	**$9,499**	**$927**	**$5,064**	**$15,490**

*Costs are "best" estimates within the ranges shown.

California
For California, we estimate annual environmentally attributable costs of childhood asthma at $289 million (range: $96 to $338 million);[40] direct and indirect costs of childhood and adult cancer at $1.3 billion (range: $500 million to $2.5 billion); and neurobehavioral disorders not attributable to lead exposure at $1.4 billion (range: $700 million to $2.8 billion). For lead exposure, we estimate a cost of $6.6 billion in future earnings foregone.

Connecticut
For Connecticut, we estimate annual environmentally attributable costs of childhood asthma at $28 million (range: $9 to $33 million); direct and indirect costs of childhood and adult cancer at $122 million (range: $49 to $244 million); and neurobehavioral disorders not attributable to lead exposure at $140 million (range: $70 to $270 million). If we look separately at costs of lead exposure, we estimate a cost of $637 million in future earnings foregone.

New York
For the State of New York we estimate annual environmentally attributable costs of childhood asthma at $154 million (range: $51 to $180 million); direct and indirect costs of childhood and adult cancer at $670 million (range: $268 million to $1.34 billion); and neurobehavioral disorders not attributable to lead exposure at $740 million (range: $370 million to $1.5 billion). For lead exposure, we estimate a cost of $3.5 billion in future earnings foregone.

Effects on Productivity

While it is beyond the scope of this paper to fully examine all of the financial impacts that flow from toxic-related disease and disability, one area with particularly significant implications is workplace productivity. Chronic illnesses among workers translate into many costs for employers. In addition to the costs to workers and to healthcare providers, employers may face costs including workers' compensation payments, retraining, and missed work days. A recent study in Germany found that the costs of these lost days of work actually outstripped the direct costs of compensation, medical treatment, and occupational rehabilitation for injured workers.[41]

And, quite arguably, the worse the disease, the greater potential economic impact. According to a recent report on environmental health and the chemical industry in California, "each year, about 23,000 Californians are diagnosed with a preventable, deadly chronic disease that is attributable to chemical exposures in the workplace," and "about 6,500 Californians die each year as a result of a chronic disease attributable to chemical exposures in the workplace."[42] Beneath the individual tragedy of these preventable diseases lurks hard economic impact. Years of training invested in developing a skilled worker are lost when that worker cannot work. Job assignments may be covered by temporary or new employees, causing extra training costs and lower productivity while those new workers climb the learning curve. Finally, employee morale is hindered, to say the least, by contracting work-related illnesses —this loss of morale also translates into reduced productivity and real costs.

On the other hand, companies that take steps to improve their environmental performance often find that reducing use of toxic chemicals can also help to improve productivity. One interesting case is that of the Massachusetts Toxics Use Reduction Act (TURA), passed in 1989. Under TURA, companies with more than ten employees that exceed a specified threshold in toxic chemical use are required to prepare a Toxics Use Reduction Plan, examining how toxic chemicals are used in their facility and what alternatives are available. Since passage of the law, more than 1,000 Massachusetts companies have participated in the program. Case studies of Massachusetts companies regulated under TURA show substantial savings achieved in the course of reducing use of toxics. As of 1995, the most recent year in which costs and savings were evaluated, these reductions were associated with substantial monetary savings. The total costs to businesses of implementing the TURA program, including training programs, data collection, and capital investments, amounted to $76.6 million. Savings in operating costs resulting from these activities added up to $88.2 million, producing a net savings of $11.6 million.[43] Operating cost reductions stemmed from reduced chemical use, product reformulation, chemical recycling and reuse, and production unit modernization.

Considerable data suggest that the savings catalyzed by TURA are not unique. For example, Chevron Texaco reported savings of over $1.5 billion between 1991 – 2000 through a combination of waste minimization, environmental risk control, and energy efficiency. DuPont saved $1 million per year by reducing toxic byproducts at its herbicide production plant in Camacari, Brazil, and IBM reported an immediate one-year savings of $193 million through a combination of reduced chemical use and waste, process improvement designed to reduce pollution, and other conservation measures.[44] Readers interested in a comprehensive discussion of the kinds of business activities that may flow out of these savings, or may otherwise be integral to achieving such savings, are encouraged to consult the Global Reporting Initiative, an international network of thousands of business, civil society, labor, and professional institutions.[45]

Some useful estimates of the costs of occupational illnesses have been developed recently in Europe. One study looked at the costs of respiratory and skin disorders associated with toxic exposures in the workplace, and estimated the savings that could be expected after adoption of the EU's proposed new chemicals policy, REACH.[46] The report looked at a set of skin and respiratory diseases that are commonly associated with toxic chemical exposures in the work environment. The report concludes that REACH benefits for occupational skin and non-malignant respiratory diseases only, in the first ten years, will be between $0.66 billion and $6.2 billion; or in the first 30 years, between $21.2 billion and $160.7 billion.

2 Risks to Shareholder Value from Corporate Toxic Chemicals Policies

By Richard A. Liroff and Tim Little

Richard A. Liroff is founder and director of the Investor Environmental Health Network and for many years served as a senior program manager at World Wildlife Fund working on toxic chemical issues. Tim Little is Executive Director of The Rose Foundation for Communities and the Environment and director of Rose's Environmental Fiduciary Project.

In addition to significant economic impact at the national or state level, corporate financial well-being is threatened by at least three types of liability risks associated with chemicals in products. These include litigation and other direct liability risks, reputational risks, and market exclusion risks.

Litigation and Direct Liability Risks

Not surprisingly, investors frequently focus on direct and measurable risks such as those that may flow from product liability, and regulatory or shareholder lawsuits, because these are the risks that make headlines, often impose sizeable costs on companies, and can have a dramatic impact on share prices on a short-term (and sometimes long-term) basis. Lead paint litigation offers a recent example. On February 22, 2006, shares of Sherwin-Williams fell as much as 22% following reports that a Rhode Island jury had found the company guilty of creating a public nuisance that was poisoning children.[47] Until that case, the company had been largely successful in lead litigation. The stock has largely recovered from its steep drop, and the jury verdict is still being contested, but the litigation cloud continues to hang over the company.

Asbestos is the chemical that instantly comes to many investors' minds when they consider toxic litigation risks. According to a report from the RAND Institute for Civil Justice, through the end of 2002 companies had paid $70 billion in response to 730,000 personal injury claims, and 66 companies had been driven into bankruptcy.[48] As scientific information emerges about other toxicants, it is understandable that some investors might worry that a portfolio company uses a chemical that could be "the next asbestos." But investors should also worry about "the old asbestos." In 2002, Enpro Industries, facing at least 118,000 asbestos injury claims, reported in its 10K that it provides estimates of liability only for "actions in advanced stages." Since the bulk of the claims it faced, while real and statistically quantifiable, were classified by the company as being in preliminary stages, only minimal liability was booked.[49] (Enpro subsequently revised its policy and estimated in its FY2005 10-K a "low-end" $166 million for early-stage and unasserted claims. It also reported additional liability ranges provided in early 2005 by a litigation consultant retained by its outside counsel.)[50] Notable companies whose claims of minimal asbestos liability morphed into multi-billion dollar asbestos trust funds include Halliburton, Kaiser Aluminum, and Dow.[51]

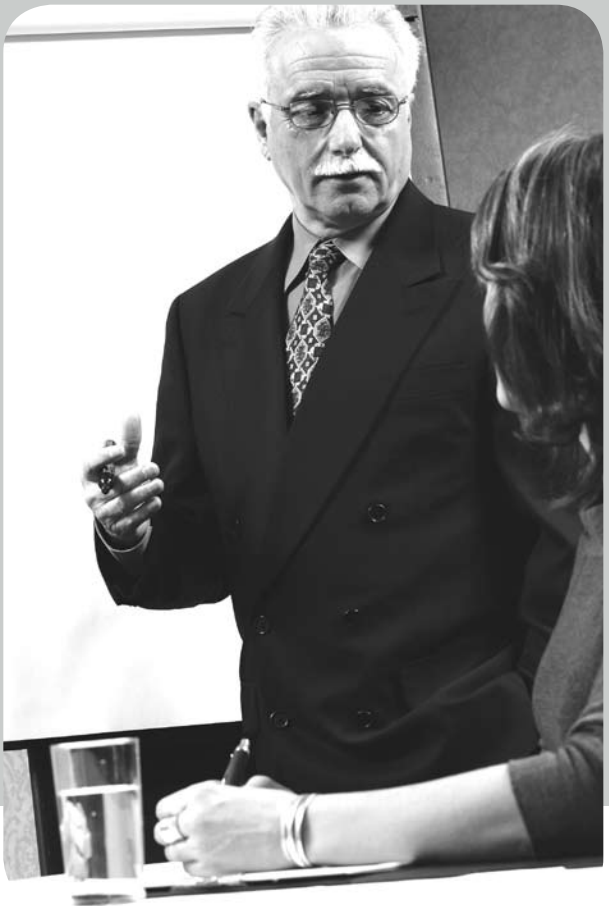
The DuPont Company (E.I. du Pont de Nemours) is in the midst of dealing with the legal fallout from its management of the chemical PFOA (perfluorooctanoic acid) used in the production of Teflon® and grease resistant coatings for food packaging and carpets. DuPont reached a settlement in February 2005 of more than $100 million for discharges of PFOA from a production facility. DuPont has also agreed to settle an EPA civil action for $16.5 million to address an EPA complaint that the company had failed to report adverse effects from PFOA "in a timely manner" and is facing a related criminal investigation. A $5 billion class action lawsuit has been filed claiming that DuPont failed to warn consumers of health risks associated with Teflon® cookware.[52] DuPont maintains that "Extensive scientific testing shows that our products including those that are branded Teflon® are safe for consumers."[53]

Lessons abound for the $35 billion U.S cosmetics and personal care industry—and for investors—in pharmaceutical giant Merck's unfolding imbroglio over the once-popular painkiller Vioxx. Once heralded as a wonder drug, Vioxx became linked with strokes and heart attacks. Merck withdrew it from the marketplace in September 2004. As of June 30, 2006, Merck reported it faces 14,200 lawsuits over Vioxx.[54] The company's 10-Q submittal to the SEC for the first quarter of 2006 signals that the company has reserved $685 million for litigation expenses through the end of 2007, but has not designated reserves for litigation judgments.[55] Merck's litigation record in the seven product liability suits that have thus far come to trial is mixed, and it is appealing those cases where initial verdicts have been unfavorable. As soon as the bad news started to hit the press in 2004, Merck's stock began to dive and investors saw the value of their Merck stock shrink 40% for the year. The company has now been targeted in shareholder lawsuits. The $120 billion New York State Common Retirement Fund has alleged that Merck's management "knew, yet failed to disclose, that a growing body of evidence demonstrated that patients who used Vioxx were at an increased risk of adverse cardiovascular reactions, including heart attack, stroke, and death."[56] The suit alleges that, by failing to tell investors about these health risks, Merck violated federal securities disclosure laws by withholding financially material information that "put lives at risk and cost shareholders billions of dollars."[57] While it faces continuing litigation risks, Merck contends it made appropriate disclosures and took appropriate actions, and as of August 2006 its stock had recovered from much of its 2004 loss.[58]

While Merck's cautionary lesson is a pharmaceutical rather than a toxic chemical issue, cosmetics and personal care industry investors concerned about potential toxics liability should be concerned that the same agency that had oversight over Vioxx, the U.S Food and Drug Administration (FDA), also regulates cosmetics. Most ominous for risk-averse investors, the Vioxx controversy, including the allegations that Merck's management was slow to react to the adverse health data and may have even deliberately withheld liability information, occurred under the FDA's drug regulation regime—which is much more stringent than the cosmetic and personal care product self-regulatory safety process. If problems of the magnitude of Vioxx could slip through the FDA's relatively tight drug screening process, what kind of product liabilities are passing unchecked through the looser cosmetics regulatory screens? The significant and unanswered questions about the health and financial liabilities that may be associated with personal care products represent real threats to reputational value, brand, franchise, market share, and profitability in the cosmetics industry. And, just as they did with Merck, investors may find themselves asking—what did cosmetics company executives know and when did they know it?

In some instances, it's not the shareholders or regulators that catalyze expensive litigation, it's other companies. In California's San Francisco Bay Area, Tosco sold an oil refinery to Ultramar Diamond Shamrock, subject to a "no look clause" where the seller did not have to disclose and the purchaser agreed not to look for environmental contamination for 10 years. But in 2000, Ultramar then sold the refinery to a third company, Tesoro, which sued for $100 million claiming it inherited undisclosed contamination as a result of the previous "no look" agreement.[59] The case is now in arbitration.[60] Regardless of the ultimate outcome, the real losers in this "don't ask—don't tell" tale are the shareholders who clearly did not get the information they needed to properly evaluate Tesoro's exposure, or who were lured by potentially false profitability posted by the other two firms stemming from the deliberately-ignored toxic liabilities.

One more category that deserves mention is historical toxic contamination.[61] Such contamination is widespread and historically has been insufficiently quantified. It is possible that some of the problems related to toxic disclosure at brownfields and other sites may be alleviated by new 2005 guidance issued by the Financial Accounting Standards Board. FAS 143 & FIN 47 require companies to provide a fair value estimate of the costs of retiring various assets, even if the precise retirement dates or actual costs cannot be currently known. The new rules caused an immediate flurry of end-of-year restatements by major companies, collectively setting aside an additional $1 billion in cleanup reserves. It's important for investors to note that these restatements cover a wide range of companies, not just those that may traditionally be thought of as operating in "dirty" industrial sectors such as manufacturing, mining, and oil & gas—the list of restatements included companies such as Wells Fargo, Citigroup, Applebee's, Payless, and Molson Coors.[62] Some FASB watchers predict that this trend of quantifying environmental contingencies may be extended to product liability—if true, this represents another "tsunami warning" that investors, fiduciaries and corporate management would do well to heed.[63]



Reputational Risk

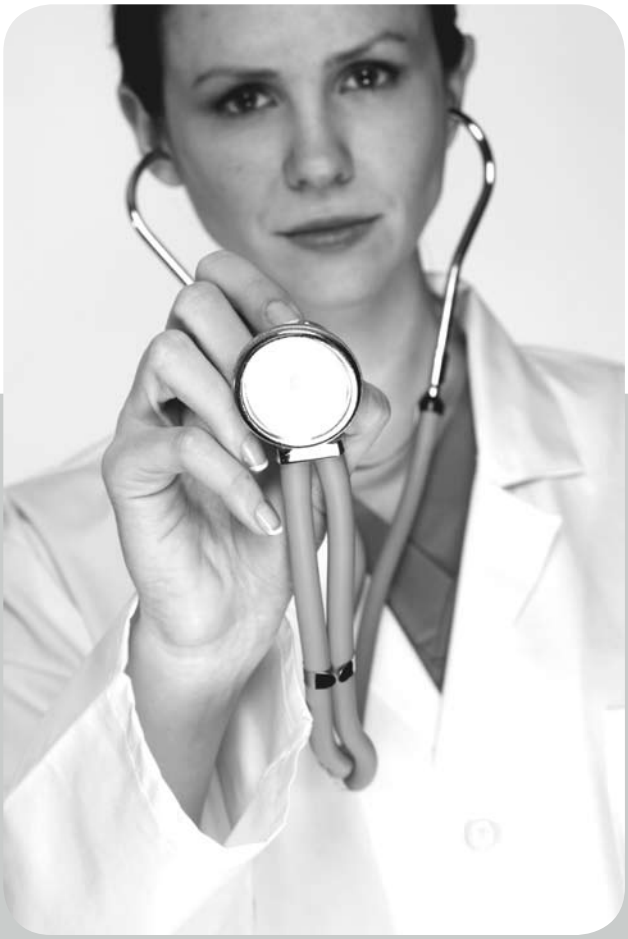
Reputational risks from toxic chemicals are also a concern to companies. A quote from a Wharton School advertisement for executive education succinctly captures this idea: "…no CEO stands up and says, 'The key assets of my company are plant, building, land, and inventory…' They say, 'It's my brand and my customers.'"[64] The sensitivity of corporations to reputational damage is signaled by some prominent cosmetics companies agreeing to reformulate cosmetics when their toxic components are highlighted by the Breast Cancer Fund and other campaigners for safe cosmetics, and by the DuPont Company running full page advertisements in the New York Times and other prominent publications featuring frying pans and a headline, "Teflon® Non-Stick Coating is Safe."[65]

Market Exclusion Risks and Opportunities

Market exclusion constitutes a third form of risk to shareholder value. Products containing certain chemicals may be excluded from markets by regulation. Increasing numbers of regulations in Europe, plus those enacted by various states in the United States, target specific chemicals for exclusion from the marketplace. These include, for example, brominated flame retardants, certain heavy metals in electronics products, and phthalates in cosmetics. In some instances, companies may be ignorant of the chemicals in their products and suffer the consequences. For example, during the end-of-year holiday season in 2001, Netherlands authorities banned the sale of Sony PlayStation consoles because the cadmium in accessory cables exceeded regulatory limits. Sony's lost sales and costs to rework their product totaled about $150 million. This episode prompted Sony to carry out a systematic supply chain and internal management review to prevent similar problems from occurring and to prepare for stricter regulations in the future.[66] Sony's nimble response to this "lump of coal" in its 2001 Christmas stocking also stands as an example of how a company can learn from a toxic mistake and position itself to avoid costly repeats.

Like the double-headed Roman door warden Janus, who guarded entrances by simultaneously considering both the past and the future, environmentally preferable purchasing programs may exclude from the marketplace products with a history of toxicity, while also creating fresh market opportunities for new products that are toxicologically safer. For example, in March 2006, the International Sanitary Supply Association published a 40-page report listing numerous state and local government green cleaning initiatives that serve to exclude from procurement programs cleaning products containing certain chemicals.[67] This would appear to be a response to recent developments in the U.S. healthcare sector that illustrate the market consequences of emerging business-to-business requirements for safer products.

One of the drivers of this change is Kaiser Permanente, the largest nonprofit health plan in the United States, serving 8.2 million members. Kaiser operates 30 hospitals and 431 medical buildings, and had operating revenues of $28 billion in 2004. It anticipates devoting $21 billion through 2012 to capital expenditures, including millions of square feet of new office space. Kaiser has set out to eliminate or reduce hazards to human health from chemicals that have been relied on to provide healthcare. The company has been working to "green" its buildings, working with manufacturers to produce cleaner, less toxic materials. The company has focused on phasing out PVC (polyvinyl chloride), eliminating mercury, and removing DEHP (di-ethylhexyl phthalate) from its neonatal units. In 2004 Kaiser launched a new chemical policy that calls for avoiding the use of carcinogens, mutagens, and reproductive toxicants, and persistent, bioaccumulative, toxic chemicals.[68] While Kaiser's new policy excluded some companies from doing business with it, it opened potentially lucrative new business relationships with other vendors and suppliers, such as C&A Floorcoverings, Inc. Just a few months after Kaiser announced its change, C&A responded by announcing a new PVC-free line of carpets that uses an alternative plastic material for backing.[69] Kaiser rewarded the company with a three-year contract. Likewise, in response to a request from Kaiser-Permanente, Construction Specialties, Inc. developed a new line of interior wall materials free of PVC, brominated flame retardants, phthalates, and precursors of dioxins and furans.[70]



Kaiser-Permanente is joined by others in the healthcare community in its quest for safer healthcare products. Catholic Healthcare West, a system of 40 hospitals and medical centers in the western United States, awarded B. Braun Medical Inc. a five-year $70 million contract to deliver PVC/DEHP-free products, switching away from Baxter Healthcare. The hospital chain's CEO noted that Braun was the first supplier having the capacity to supply such products.[71]

Healthcare group purchasing organizations are undertaking related initiatives. For example, Premier, Inc., owned by 200 healthcare systems in the U.S. representing 1,500 hospitals, has created an internet-based resource to help healthcare organizations in the environmentally friendly selection, recycling, and disposal of computers and electronics.[72] Consorta, Inc, a $4.1 billion healthcare group purchasing organization, has an environmentally preferable purchasing program that draws on a database containing information from suppliers about their environmentally preferred products.[73]

3 Toxic Chemical Risk and Fiduciary Duty

By Jonas Kron

Jonas Kron is an attorney specializing in shareholder advocacy, and has co-authored or contributed to a number of articles and papers exploring institutional investor fiduciary duties as they apply to environmental, social and corporate governance issues. He was consultant to Freshfields Bruckhaus Deringer on their landmark fiduciary study discussed in the text below.

Despite the multitude of examples where financial costs and/or benefits clearly may correspond to the size of a company's toxic footprint, there continues to be a high degree of uncertainty in the minds of many fiduciaries about the prudence of considering these issues and appropriate methods for engagement. This section answers the question: Can fiduciaries address these concerns in light of their responsibilities to beneficiaries?

The short answer from some of the most respected legal authorities in the world is a loud, "Yes." Recently the world's third largest law firm, Freshfields Bruckhaus Deringer, in an October 2005 report written for the United Nations Environment Programme Finance Initiative (UNEP-FI), concluded that integrating environmental considerations into investment decisions is clearly permissible and arguably required.[74] This is in keeping with the conclusion reached by the prestigious international corporate law firm of Baker & McKenzie in 2000.[75]

Considering Environmental, Social and Governance (ESG) Issues is Part of Prudent Portfolio Management

In its October 2005 report, Freshfields Bruckhaus Deringer concluded that integrating environmental considerations into investment decisions is required when they are relevant to investment management. This thorough and rigorous analysis of United States fiduciary law applies to the specific issues raised by toxic chemicals and environmental health. It logically follows that fiduciaries should incorporate information regarding a portfolio company's production and use of toxic chemicals and the impact of that activity on human health when it impacts value, risk, and return.

Freshfields' conclusion follows the 2000 report from Baker & McKenzie which stated that integrating ESG issues into investment decisions is consistent with fiduciary duties. These statements from two highly respected law firms demonstrate how this standard has become so firmly established. Add to this the recently released UNEP Principles for Responsible Investment, which are now backed by more than $4 trillion in assets, and it is evident that it is prudent to integrate ESG issues into investment management decisions.[76]

It is becoming increasingly clear that a growing number of mainstream investors are following this legal advice and are moving towards the incorporation of ESG considerations into investment decisions. For example, this past year, Citigroup subsidiary Smith Barney issued a report that assessed sustainability issues across 28 sectors.[77] In comparison, Goldman Sachs took a quantitative approach by correlating 42 ESG criteria in the energy sector to financial performance and concluded that these criteria are important drivers of future performance and valuation.[78] UBS took the approach of seeking to quantify that which is qualitative by establishing a framework to measure corporate social liabilities across nine sectors in its socially responsible investing (SRI) report.[79] Finally, Merrill Lynch partnered with an environmental nongovernmental organization—the World Resources Institute—to produce a report analyzing investment opportunities due to climate change in the auto sector, making specific stock recommendations on seven companies.[80]

Most recently, and perhaps most significantly, the UNEP-FI Asset Management Working Group issued a report that concluded that there is "significant evidence of the positive and negative impacts environmental, social, and governance issues can have on share price across multiple sectors."[81] In other words, the Group determined that ESG issues are material. What these firms and organizations have demonstrated through their validation of SRI strategies is that mainstream financial institutions are seeing the merits of SRI strategies and that ESG issues have become mainstreamed.

These ESG considerations may clearly impact pension funds, although the exact structure of an appropriately prudent response may vary slightly from state to state and among public, private and Taft-Hartley funds. State pension funds are governed under state law and as a result the specific wording of fiduciary duties varies from state to state. Nevertheless, there are general principles that are reflected in every state. These principles can be gleaned from the Restatement (Third) of Trusts, the Uniform Prudent Investor Act, and the rules established for private pension funds under ERISA.

In summary these authorities, as interpreted by lawyers and judges, conclude that environmental considerations are part of prudent portfolio management so long as:

- they are not motivated by a purpose of advancing or expressing the fiduciary's personal views concerning environmental issues; (Restatement)
- the interests of the beneficiaries have not been sacrificed; (UPIA) and
- they do not trump conventional financial considerations. (ERISA)

This means that as long as environmental considerations do not, for example, unbalance the entire portfolio, make the portfolio not diversified, or otherwise cause the portfolio to be "unable to meet the suitable risk and return objectives,"[82] they may be taken into account. As the leading treatise on trusts puts it:

> *Trustees in deciding whether to invest in, or to retain, the securities of a corporation may properly consider social performance of the corporation. They may decline to invest in, or to retain, the securities of corporations whose activities or some of them are contrary to fundamental and generally accepted ethical principles. They may consider such matters as pollution, race discrimination, fair employment, and consumer responsibility. (emphasis added)* [83]

When Toxic Issues Impact Shareholder Value They Must be Considered

When there is evidence that the use of a particular chemical may have a significant impact on the value of a company it must be a part of the fiduciary's decisions regarding the investment. Under various expressions of fiduciary law in the United States, a fiduciary is considered to have satisfied his/her fiduciary duties if the fiduciary has given appropriate consideration to information that is relevant to a particular investment or investment plan.[84] Relevant information is best understood in the context of federal securities law concerning what information is considered important enough to disclose to shareholders—i.e. "materially significant" information is information a reasonable investor would consider significant.[85] In other words, fiduciaries must consider facts and circumstance that are materially significant to the investment or investment plan.

As outlined in the preceding section, there is a strong business case to be made related to the impact of the use of toxic chemicals on the value of a company. This information is often information which a reasonable investor would consider to be significant and therefore must be considered by fiduciaries.

Shareholder Resolutions Implicating Environmental Health Risk Must be Fully Considered

Under existing law fiduciaries must consider the facts and circumstances presented by shareholder resolutions. Specifically:

- *"the fiduciary act of managing plan assets which are shares of corporate stock . . . includes the voting of proxies appurtenant to those shares of stock."* [86]
- *a fiduciary who "fails to vote, or casts a vote without considering the impact of the question, or votes blindly with management" will violate the rule of prudence.*[87]
- *the duty of prudence includes a duty of inquiry into the relevant facts and circumstances surrounding the investment decision.*[88]

Consequently, when a pension fund or its proxy adviser is making a decision about how to vote on a shareholder proposal involving environmental health risk, the fiduciary must not vote blindly with management. Rather, the fiduciary has a duty to inquire into the facts presented by the proposal and consider the impact of the issue.

The Fiduciary Duty to Monitor Requires Fiduciaries to Monitor Their Investments for Liabilities

Under black letter law, fiduciaries are under a clear duty to monitor their investments. For example the UPIA concludes that there is a "continuing responsibility for oversight of the suitability of investments already made." This includes a duty "to examine information likely to bear importantly on the value or the security of an investment."[89]

As further stated in the Restatement, "The trustee has a related duty of care in keeping informed of rights and opportunities associated with those investments."[90]

In an ERISA case, a federal appeals court concluded that "fiduciaries are responsible for ensuring that information [concerning an investment] is complete and up-to-date."[91]

Unfortunately, beyond these general principles there is little specific guidance from the courts, regulators, or commentators on the scope of the duty to monitor particular equity holdings. The concerns for fiduciaries raised by this vagueness are enhanced by the growing emphasis on transparency and strict adherence to fiduciary duties that has arisen in the post-Enron era. This vague guidance, combined with the clear regulatory trend towards transparency, opens fiduciaries to the risk that a court could find them liable for failing to effectively monitor their investments for environmental liabilities.

As we have seen within a number of industries, asbestos being the best known example, significant liabilities have gone unaddressed for years in part because shareholders have not engaged in concerted challenges to the bald assertions and assumptions made by management regarding those potential liabilities.

Given that fiduciaries are obligated to ensure that the information they are using to make investment management decisions is complete and current, it is evident that the fiduciary duty to monitor requires the simple step of investigating whether liabilities are being properly disclosed and addressed by companies they have invested in. Consequently, it is fair to conclude that it is good practice for fiduciaries to engage companies on the question of toxic chemical liabilities – both because of the implications for value and to alleviate the specter of a legal challenge based on a failure to monitor.

Do Fiduciaries Have an Affirmative Duty to Engage Portfolio Companies on Toxics?

However, beyond reducing potential personal liability for fiduciaries, monitoring and/or engaging portfolio companies on toxics issues may uncover previously-hidden risk that may threaten a portfolio company's profits, market share, brand, reputation, competitive positioning, franchise, or other elements of shareholder value. Thus, does a fiduciary have an affirmative duty to ensure that an appropriate engagement policy is in place to protect portfolio value? Put simply, is such an engagement policy around toxics and environmental health part of a trustee's duty to act as a watchdog for potential threats to portfolio value?

The answer is not a simple one, especially given the size of many institutional portfolios, the potential complexity of a comprehensive analysis of environmental cost, risk, and benefit factors, a given portfolio's own risk tolerance and demands of return, and the quantifiable cost of engagement versus a possible but speculative increase in shareholder value. But here is where the long-term nature of many institutional portfolios may provide the decisive guidance. For example, while there is clearly a need to meet actuarial projections to support short-term benefits to beneficiaries, those beneficiaries are no less counting on the fund to provide for future years, decades and even beyond. Considered in this type of time scale—a scale which is fully within the appropriate legal scope of a long-term pool of capital—some level of near-term expense to prod portfolio companies towards increasing long-term value through greater long-term environmental sustainability may meet even the most conservative definition of fiduciary prudence.

Recent Fiduciary Actions on Toxics and Other Environmental Issues

In fact, many fiduciaries are beginning to assess and evaluate environmental risks and value drivers. For example, the Investor Network on Climate Risk, for which CERES, the Boston, Massachusetts-based NGO serves as secretariat, illustrates how investors are already mobilizing to respond to environmentally-related threats to shareholder value. Building from a single shareholder resolution filed with American Electric Power by Connecticut Treasurer Denise Napier in 2001, the INCR has grown to a broad collaboration of 50 institutional investors, from 15 countries, collectively representing over $3 trillion. Speaking with one voice on the macroeconomic issue of global climate change, these investors have jointly developed a Global Framework for Climate Risk Disclosure to provide specific guidance to companies regarding the information they should provide to investors on the financial risks posed by climate change. To sharpen the point, many INCR members have invested resources into filing shareholder resolutions and engaging dozens of major companies in the electric power, oil and gas, retail, and home building sectors. Several of these resolutions have received shareholder votes of over 20%—a threshold that indicates widespread investor acknowledgement of the dimension of the financial risks being raised by these institutional investing leaders.[92] The emerging Investor Environmental Health Network is following much the same path in raising toxics issues.

The 2006 Shareholder Season

Energized by IEHN, the 2006 shareholder season saw an unprecedented wave of shareholder activity raising toxics issues. In more than a dozen filings, shareholders requested reports on safer chemicals policies, product safety, and reformulation possibilities. Most received votes in the 5% - 10% range, considered a respectable first-year showing for a new issue. A resolution at DuPont fared even better. Twenty-nine percent of Dupont shareholders voted in favor of a resolution filed by Amalgamated Bank's LongView Collective Investment Fund asking management to report on options to accelerate the company's phase-out of the use of PFOA. PFOA is used in production of Teflon® cookware, and grease and stain-repellent coatings for carpets, textiles and fast-food wrappers, and is of concern due to persistence in the environment and potential health effects such as cancer, liver damage, and birth defects. Please see Appendix 2 for a compendium of the toxics issues raised in the 2006 season.

These shareholder initiatives, in turn, are starting to help steer corporate toxics policies. While generally citing various reasons for adopting more health-protective policies (often including consumer pressure), companies who acted after the 2006 proxy season often acknowledged the role of shareholder dialogue in advancing toxic issues to the forefront of management's attention. For example:

- Whole Foods Markets announced that it would remove baby bottles and other products that contain certain toxics from its shelves as part of a new corporate policy initiative to reduce customers' exposure to hormone-disrupting chemicals.
- Wal-Mart announced a new "preferred substances policy" that incorporates a precautionary, hazards-based approach to chemicals management, initially focusing on persistent bioaccumulative toxics and carcinogens.
- ConAgra agreed to analyze and report on alternatives to PFOA in food packaging.
- Becton, Dickinson agreed to survey its suppliers regarding brominated flame retardants in its medical devices.
- Johnson & Johnson agreed to initiate a stakeholder dialogue with one of the cosmetics industry's harshest critics, the Campaign for Safe Cosmetics.

Investors have filed additional resolutions in the 2007 shareholder season, summarized in Appendix 3.

Proxy Voting Polices Begin to Address Toxics Issues

Some fiduciaries have begun to revise their proxy voting guidelines to specifically address toxics issues and to engage their portfolio companies on the topic. Here are a few examples of this growing groundswell:

Connecticut
In the summer of 2006, the $22 billion Connecticut Retirement Plans and Trust Funds updated their Global Proxy Voting Policies to specifically support shareholder resolutions that request companies to disclose their policies related to toxic chemicals.

New York City
The five New York City pension funds (combined assets $140 billion) have adopted proxy voting guidelines in support of the following types of resolutions:

- Requests that the company reformulate its cosmetic products worldwide to match the new product safety requirements of the European Union (EU), and issue a report to the shareholders.
- Requests that the company develop plans to convert to the use of chlorine-free paper.
- Requests that the Board of Directors adopt a policy of phasing out, at the company's health-care facilities, the use of PVC-containing or phthalate-containing medical products, where alternatives are available.

Institutional Shareholder Services
The wave of 2006 toxics-related resolutions also spurred proxy advisors such as Institutional Shareholder Services (ISS) to revisit their policies regarding the prudence of considering environmental factors—specifically toxic-related risks to shareholder value. ISS, the world's leading provider of proxy voting and corporate governance services to institutional investors, serving more than 1,600 clients worldwide and making proxy voting recommendations for more than 35,000 companies, did not even have a policy on toxics until 2006. However, ISS now recommends a "FOR" vote on shareholder resolutions requesting disclosure of policies related to toxic chemicals.

Overall, the combination of recent fiduciary engagement, groundswell of investor support as evidenced by the proxy votes, and the specific and growing integration of toxics into proxy voting guidelines all point in the same direction. Fiduciaries are clearly seeing the financial dimension of the toxics issue and viewing engagement as a prudent response.

4 Addressing Toxic Chemicals: A Road Map for Fiduciaries

By Jane Ambachtsheer

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In the previous sections we have explored why toxic chemical risk is an important:

- health issue,
- financial issue, and
- fiduciary issue.

With this information in hand (and see box on page 28 —"The Breadth of 'Chemical Risk' to Portfolios") the next step is to determine what your fund is doing or can do to address toxic chemical risk arising from toxic chemicals in products and associated supply chains. This section takes a fiduciary through a three-step process of assessment, exploration, and action.

The Breadth of "Chemical Risk" to Portfolios

Richard A. Liroff

Investors are increasingly recognizing the breadth of the risk to portfolios from "climate risk." From insurance companies to power plants to coastal property owners, climate risk cuts a broad swath across portfolios. Careful examination of emerging regulatory structures and shifting market demand suggests that the breadth of chemical risk may be equally broad.

The breadth stems from the cross-cutting and synergistic effects of new regulations targeting specific classes of products combined with new regulations targeting specific classes of chemicals. While frequently launched with a national or regional focus, such as regulations in the European Union, these can have global impact resonating up and down supply webs in diverse economic sectors. Their effect is multiplied further by forward-looking sustainability and "beyond compliance" endeavors from leading corporations that effectively shut various chemicals and products out of major procurements.

The most noteworthy examples come from the European Union. These include, for example:

- **The EU's Restriction of Hazardous Substances (RoHS) Directive** requires member states to restrict the use of six specific chemicals in electrical and electronic products placed on the market after July 2006. (Wal-Mart has declared that all computers sold in its stores in the United States must comply with these European standards, and adoption of RoHS has stimulated similar requirements adopted by China.)

- **The EU's Cosmetics Directive**, which outlaws specific cancer- and mutation-causing chemicals and reproductive toxicants in cosmetics and personal care products. Such major cosmetics companies as Revlon and L'Oreal have signaled they will comply with these requirements globally.

- **The EU's Waste Electrical and Electronics Equipment (WEEE) Directive** makes producers of electrical and electronic products responsible for the collection, treatment, recovery, and disposal of all waste electrical and electronic equipment. Beginning December 2006, producers will be required to meet recycling and recovery targets. These requirements will impact producers' supply chains, since producers will have an incentive to choose less hazardous and more easily recycled materials.

- The EU's new **Registration, Evaluation and Authorization of Chemicals (REACH)** regulation, enacted in December 2006, will promote substitution of safer chemicals for those chemicals that persist and build up (bioaccumulate) in the environment.

European enactments are increasingly being mimicked by California and other states, filling the void created by a quiescent federal **U.S. Environmental Protection Agency.** For example, the European Union outlawed two types of brominated flame retardants. California followed suit, and then a major manufacturer of the chemicals, Great Lakes Chemical Corporation (now Chemtura), voluntarily withdrew them from the national U.S. market.[93] Similarly, California adopted new cosmetics legislation requiring greater disclosure of the chemicals in cosmetics and personal care products.

The broad array of new legal requirements, combined with government and corporate environmentally preferable purchasing programs, signals that chemical risk issues will need to be addressed at least by companies in such sizeable economic sectors as: electronics, health care, personal care products, home cleaning products, automobiles and automotive products, food processing and retailing, "big box" retailing, building supplies, home and office furnishing, and, of course, the chemical sector.

Step 1) Assessment of Trustee Awareness of Chemical Risk Issues

Questions to ask yourself

Before discussing these issues with other people and organizations, you should assess your understanding of chemical risk and how you are managing it. Some questions that you can ask yourself include:

- **Is there the potential that chemical risk could have material impact** on the assets entrusted to our care?
- **How significant is the impact of chemical risk** likely to be on our portfolio?
- **Are we providing incentives** (via our mandates and fees spent) for the risks associated with toxic chemicals to be addressed?
- **Are our concerns about toxic chemical risk such that we want to address it more actively?** Could we work together with other investors?
- **What are the appropriate resources** to dedicate to this issue?
- **Should we identify an individual to have responsibility** for keeping us abreast of chemical risk? Is there an appropriate person?

The outcome of this discussion should help you determine which of the steps on the following pages may be most suitable for you, and to identify an individual or group to take responsibility for this issue. Many trustee groups will likely find that, if there is consensus that chemical risk could materially impact the assets under their care, they do not yet have a formal statement in place about this view, nor have they reflected it in their investment policy. It may be that as a trustee group you lack the tools to be able to answer these questions. If this is the case, then external advice could be sought (e.g., from your investment consultant or specialist groups).

A. Develop a policy guidance statement on toxic risk

Investment positions (or investment beliefs) form the foundation of investment decision making. To determine your investment position with respect to toxic chemicals, you should have a discussion at the board/committee level. Such a discussion would ideally lead to the development of a formal statement, for example:

> **We believe that toxic chemicals have the potential to pose a real and material risk to the financial performance** of our investments (particularly over the long term), and therefore the returns that the fund will make.

Having a position around toxic chemicals is important, as it provides the framework for further decisions and actions. Once formalized, your position could be made public and shared with relevant parties.

B. Consider your time horizon

By nature, many institutional investors are long-term investors, typically with a time horizon of more than five years. Impacts of toxic chemicals will be felt most acutely over the long-term, and are therefore most relevant to the management of the assets being invested over this term. Associated performance monitoring frameworks, evaluation criteria, and manager fee structures should be clearly defined to align the interests between trustee groups and investment managers.

C. Enhance your investment policy

Once you have (1) developed an investment position on toxic chemicals and environmental health and (2) determined your time horizon, you should take the important third step of reviewing your investment policies to ensure that the policies address both issues appropriately. This enhanced policy can be made public and shared with relevant parties.

Both the nature of each fund's investment policy (how exhaustive it is), and its investment approach will factor in to what a revised investment policy might look like. A plan that is 100% externally managed, with an oversight committee that does not have ample time or resources, may want to add something like this:

> **We will encourage our internal and external investment managers** to ensure that they address the potential risks stemming from toxic chemical risk in our investment portfolio, and ask for annual updates in regard to this to ensure appropriate consideration to this effect.

On the other hand, a different plan may choose a more active route and enhance their policy to say something like this:

> ***We will encourage our internal and/or external investment managers*** *to ensure that they address the potential risks stemming from toxic chemicals in our investment portfolio. To ensure this, we will:*
>
> - *Ask our managers to include updates on their ongoing management of toxic chemical issues in their regular monitoring reports.*
> - *Use stock-level research to conduct periodic audits of our portfolio, to highlight any stocks of specific concern, and discuss them with our investment managers to assess and ensure their awareness of these issues.*
> - *Ask our investment consultant to incorporate the above two points as an element in our annual monitoring report.*
>
> ***We will seek to use the weight of our assets to promote toxic chemical risk management*** *and mitigation within the market as a whole.*

The investment policy can also go on to address proxy voting and any portfolio-specific items being pursued in relation to toxic chemicals, such as specific investments or investment guidelines that are developed.

Step 2) Explore the issue with your investment consultants and managers

At this stage trustees should have a dialogue with the fund's investment consultants and investment managers. This dialogue can:

- **Inform you about the perspectives and capabilities** of your service providers on this issue.
- **Help you to further your own understanding of the issues and opportunities**, and how they are or can be managed.
- **Lead the broader investment community** to understand that this is an issue of importance to the end-owners of assets, thereby encouraging them to develop appropriate capabilities to manage the implications of risks associated with toxic chemicals in products and their supply chains.

Investment consultant
It is helpful to discuss these issues with your investment consultant because it will allow the fund to incorporate the issues into the various stages of the investment process. Specifically, you can ask your investment consultant:

- **Have you developed internal expertise in this area?** How many of your consultants and actuaries have a reasonable level of understanding around the potential for toxic chemical issues to impact financial risk and return?
- **What are the implications of toxic chemicals regarding the short, medium and long-term performance** of fund assets (and therefore our ability to meet liabilities)?
- **How do toxic chemicals relate to asset allocation** and investment mandates?
- **Do our current mandates expose the fund to longer-term risks like toxic chemicals** by driving a shorter-term focus amongst our fund managers?
- **Are we benchmarking our fund managers correctly** and against the correct time frame?
- **Have you done any specific work to evaluate the capabilities of investment managers** in relation to their management of toxic chemical issues?
- **If toxic chemicals are not being addressed by investment managers**, what incentives can be provided to rectify this?
- **Does any of your consulting advice incorporate a perspective on toxic chemicals**, and if not, what would be the opportunities for it to do so?

Investment managers
Discussing these issues with your investment manager is important because they bring toxic chemical related analysis into the investment management process.Without such analysis toxic chemical risk will not be appropriately managed.

The following questions could be posed to investment managers to better understand areas that require further attention, and to get toxic chemicals on your managers' agendas:

- **Have you developed internal expertise in this area?** How many of your investment analysts and portfolio managers (across different asset classes) have a reasonable level of understanding around the potential for toxic chemical issues to impact financial risk and return?
- **Do you have any individual or group with a dedicated focus on toxic chemicals?** If yes, how does that group relate to your traditional operations?
- **Have you made any public statements about toxic chemicals as a financial risk?** To which asset classes does this extend?
- **How often are issues related to toxic chemicals in products discussed with company management?** Are these issues addressed during specific meetings between environmental specialists and management, or as part of your mainstream analyst meetings with management?
- **What are some of the toxic chemical-related discussions** you've had with company managements in the past 12 months?
- **Do you purchase any external research**, or participate in any external networks on this issue?
- **Is there a process for ensuring toxic chemical risks are built into your traditional investment decision-making process?** How is this accomplished?
- **How do you encourage brokers to include analysis of these issues** in their research notes?
- **Do you participate in the Enhanced Analytics Initiative** or any other mechanism to incentivize brokers to integrate ESG factors into company analysis?
- **Are there mandate qualities or particular benchmarks** which would encourage toxic chemical issues to be better incorporated into investment decision-making?
- **Do you collaborate** with others to address toxic chemical risks and opportunities?
- **Can you incorporate a regular discussion of toxic chemical analysis** into your fund's monitoring reports?

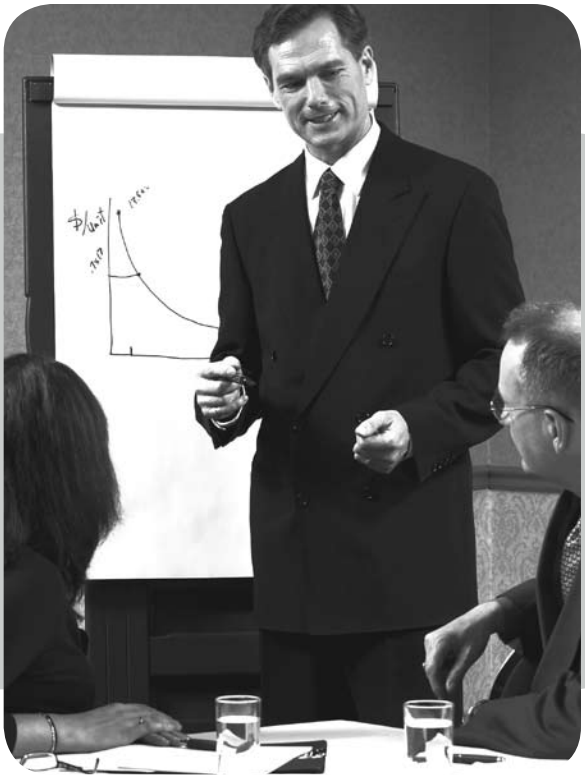
Step 3) Action

In addition to the steps suggested above, there are various actions trustees can take to address toxic chemical risk. Many of these options can be done simultaneously, consecutively, or in place of each other. Remember, addressing toxic chemical risk is an ongoing process, which you can take one step at a time.

Be an active owner
There are increasing numbers of public pension funds that have been taking an active role with their investments. The pension funds of California, New York State, New York City, and Connecticut are the most obvious examples. But there has been heightened awareness and activity at other funds such as Ohio, Maryland, Florida, Vermont, and Minnesota.

Some of the actions taken by these funds include:

- **File or co-file shareholder resolutions:** In 2005, US investors filed a record number of toxic chemical resolutions with corporations. In total, 11 resolutions requested reports on the use of safer substitutes and chemical security issues.
- **Develop proxy voting guidelines:** (either directly or with an advisor) which reflect an active approach towards addressing toxic chemicals and related risks. Consider optimal ways for your fund to implement its proxy voting guidelines (via fund managers, or external proxy voting services). Participate in voting decisions and/or monitor that votes are effectively cast per your approach. Publish your voting record.



- **Participate in shareholder engagement activities:** This could be:
  - Directly with companies as an individual shareholder; or
  - In conjunction with other shareholders.

  (For those wishing to engage directly with companies as shareholders, a sample letter designed to be sent singly or by multiple signatories jointly is provided in Appendix 1. This could be a first step in soliciting information from portfolio companies.)
- **Encourage engagement:** Ask your fund manager to undertake engagement on toxic chemical risks and opportunities on behalf of your assets. If your fund manager is unable to provide engagement services directly, you may wish to consider an engagement overlay service, whereby you outsource the responsibility for active shareholding with investee companies to a third party provider.
- **Participate in the public policy debate.** Trustees are responsible for protecting the assets of their beneficiaries and, essentially, for ensuring the long-term security provided by these assets. In this role, it is valid for trustees to consider participating in the public policy debate around the use of toxic chemicals. Trustees can engage with policy makers to encourage policies that best meet the long-term interest of the economy and hence the long-term mandates in their care.
- **Encourage the sell-side.** Instruct your fund managers to allocate a proportion of your broker commissions to encourage the inclusion of what some label “extra financial issues” in broker analysis, and better research on issues like the use of toxic chemicals.

Review your portfolio holdings
For equities and corporate bond portfolios, trustees could use company-level research to determine the extent to which their assets are exposed to toxic chemical risks. This process can be insightful in allowing you to learn what the existing risks in equity portfolios are (on a per company level), and whether your managers are aware of those risks (on a per company level) through follow-up discussions. Serving as a litmus test, actions can follow —depending on what the findings are.

For example, if the process uncovers any risks of which your managers were not aware, you could ask them to develop systems to measure and manage these risks better in future. If, over time, you still feel these risks are not being properly factored in, you may wish to select an investment manager with superior capabilities in this area.

The information needed to undertake such a review could come from mainstream broker research or specialist environmental research providers.This process could be undertaken directly, in conjunction with your investment consultant, or with other investors.

Consider your investment mandates and monitoring process
During Step 2 of this process, you may have explored the capabilities of your investment consultants and managers in relation to toxic chemicals. While asking service providers about their capabilities may help you to spur them into action, trustees also need to ensure that any structured agreements with these parties properly encourage and reward the incorporation of toxic chemical risk.

Structure investment mandates to effectively address toxic chemical risk
Investment mandates could:

- **Request that investment managers** include a rigorous analysis of chemical risks and opportunities as part of their ongoing investment management process;
- **Align reward structures** so that investment management performance over the long-term is directly related to fees;
- **Request that these issues** be included in regular monitoring reports, so that you can ensure that the appropriate analysis is undertaken;
- **Request fund managers** to appropriately encourage and reward brokers to produce research that analyzes chemical risk; and
- **Suggest that fund managers** behave as active investors vis à vis chemical risk.

Investment manager monitoring reports
Regular monitoring reports provide trustees with the means to monitor the performance and management of their assets, so asking your service providers to include a discussion of chemical risks is a reasonable way to stay on top of this issue, and to make sure that your providers are staying on top of it too.

A request that investment managers include a discussion of toxic chemical risk in relation to the management of assets would not be unreasonable (although such risk may not warrant pages of discussion every quarter). However, there will be risks that relate to toxic chemicals which could impact buy or sell decisions.

If an investment manager is undertaking toxic chemical analysis and is aware of these issues, they should be able to discuss the role that they play in broader investment decision-making over time. Furthermore, if managers are investing for the long-term, they should be able to comment on activities and decisions taken in this broader context.

Investment consultant monitoring reports
If an investment consultant is engaged to provide regular monitoring across all of a fund's investments, they could aggregate individual investment manager commentary on toxic chemicals into a consolidated report for trustees. In addition, tools could also be developed by investment consultants to provide independent insight into managers' ongoing management of toxic chemical-related risks, as well as into any portfolio wide, macro issues of which they should be aware.

Consider toxic chemical related investments
Investors who believe that toxic chemical issues can be financially material, may wish to consider investing a portion of their assets in strategies that specifically incorporate elements of toxic chemical analysis in their investment philosophies. Such potential opportunities might include:

- **Equity products:** Invest in funds which take into consideration the impacts of toxic chemical risk (along with other environmental, social or corporate governance issues), or explicitly require inclusion of the impact of toxic chemical risk into the risk management strategies of more mainstream portfolios.
- **Fixed Income products:** Invest in fixed income products which take toxic chemical risk and opportunities (along with other environmental, social or corporate governance issues) into consideration (of particular relevance for corporate bonds).
- **Clean Technology:** Invest in new technologies directly via emerging private equity and alternative investment opportunities.

Which approach to choose?

There are clearly many actions that you can take to address toxic chemical risk. That said, not every approach will suit every investor. A number of factors will play into which approach is right for you, both in the short and longer term, such as:

- **The characteristics of the trustee group** (shared position on this issue, decision making process, and governance structure).
- **The characteristics of the fund in question** (asset size, funding status, maturity, asset allocation and investment approach, internal vs. external management, and monitoring).
- **The perspective of plan members and sponsor** (alignment with member views, and sponsor's sustainability policies—corporate, government, or other).

As a first step, the chair of the trustee group or investment committee should put the issue of toxic chemical risk on the agenda. Once trustees have familiarized themselves with the issues using this roadmap as a guide, they can discuss and determine which steps to take first, and formally allocate the appropriate time and budget (up-front, and ongoing) to meet their needs in addressing this important issue.

Appendix 1

Prototype Investor Inquiry Letter to Companies Regarding Corporate Safer Chemical Policies

(Note: Portions of this letter are adapted from the Carbon Disclosure Project's February 1, 2006 letter to corporations regarding potential risks and opportunities relating to climate change. This version has been prepared by Richard A. Liroff, Director of the Investor Environmental Health Network.)

Dear CEO/Investor Relations Department:

As institutional investors with XX funds under management, we are continuously examining the companies in our portfolios to assess the potential risks and opportunities relating to evolving science and regulations regarding toxic chemicals in products and supply chains. We are seeking to improve our understanding of possible material impacts on the value of our investments driven by the following factors connected with toxic chemicals in products:

- The European Union has adopted directives specifically outlawing various chemicals in cosmetics, electrical and electronic products, and toys, and increasingly is making it the responsibility of producers of various products (automobiles and electronics) to manage waste products
- California and other states in the United States, inspired in part by European regulation, are increasingly enacting legislation broadly restricting chemicals, increasing producer responsibility, and requiring use of safer chemicals and non-chemical methods in management of schools, buildings, and other public places
- Major US and European corporations have adopted environmentally preferable procurement policies and retailing policies, thereby restricting specific chemicals and chemical-containing products
- Major retailers and manufacturers have established safer chemicals manufacturing and procurement policies with the goal of reducing their costs, providing advantage in the marketplace, and serving their customers in a more healthful manner
- Government health and education budgets likely are incurring avoidable costs because those they serve are unnecessarily exposed to toxic chemicals that contribute to asthma, developmental problems, cancers, and other health disorders

With the above considerations in mind, we would be grateful if you could respond to the questions below. These questions, though fairly detailed, will help us understand how NAME OF COMPANY is responding to increasing regulatory, competitive, and market demands that companies remove toxic chemicals from their products and gauge potential risks to shareholder value. We recognize that it can be time-consuming to answer questions like those below in addition to your current environmental reporting. However, your answers will provide valuable, investment-relevant information that is not always readily available from other sources.

(over)

1. Has your company adopted any kind of “safer chemicals or safer products” policy committing you to eliminating certain specific toxic chemicals in the products you manufacture or retail by certain dates, even if some of these chemicals have not yet been formally banned or limited by regulators?
2. What procedures do you have in place to identify the chemicals in products or materials you procure from your supply chain? Are there discrete lists of chemicals that you seek to avoid when alternatives are available, that you’ve scheduled for phaseout, or for which you set concentration limits? To develop such lists, do you check just against published lists of regulated chemicals or do you look beyond these lists? Which published lists do you rely on?
3. What procedures do you have in place to identify the chemicals in materials provided by your suppliers? How do you audit or verify this information?
4. What kinds of guidelines or financial incentives does your company provide to its suppliers to encourage them to substitute safer chemicals or conduct research on safer chemicals?
5. What kinds of training or financial incentives does your company provide to its staff to encourage them to substitute safer chemicals or conduct research on safer chemicals?
6. Does your company have any kind of formal “Green Chemistry” Program?
7. Does your company have a policy to globally reformulate products to meet the toughest existing regional or national standards for chemicals? In other words, for example, if the EU or California ban certain chemicals in your products, do you reformulate to meet this standard in all your global markets?
8. In providing financial disclosures to investors, does your company summarize and analyze major new scientific findings in peer reviewed studies or by government sponsored bodies that signal health or environmental risks associated with materials in your products? Do you make future-oriented statements about how such findings, changing regulations, or environmentally preferable purchasing programs may positively or negatively influence the financial value of your company?
9. Do products you manufacture or retail contain lead, mercury, polyvinyl chloride, brominated flame retardants, perfluorinated chemicals (e.g,, PFOA), DEHP (a phthalate chemical), or Bisphenol-A? If so, what steps has your company taken to reduce or eliminate these chemicals from its products?

Thank you very much for your cooperation.

Sincerely yours,

Appendix 2

Compendium of 2006 Environmental Health Shareholder Resolution Resolved Clauses

Avon Products
Lead Shareholder: Domini Social Investments
2006 vote: 4%
Resolved: Shareholders request the Board to prepare a report analyzing and articulating Avon's policy on using safer substitutes for chemicals that are known or suspected carcinogens, mutagens, and reproductive toxicants, as well as chemicals that affect the endocrine system, accumulate in the body, or persist in the environment. The report, prepared at reasonable cost and omitting proprietary information, should be made available to shareholders by November 1, 2006.

Becton, Dickinson
Lead Shareholder: Domini Social Investments
2006 vote: 8.7%
Resolved: Shareholders request that the Board publish by October 2006, at reasonable cost and excluding proprietary information, a report evaluating the company's policies on BFRs and other internationally recognized toxic chemicals of concern, including the status of the chemicals in company products, and a plan to revise policies and practices and to e3ephase out the uses of target chemicals.

CVS Corporation
Lead Shareholder: Boston Common Asset Management
2006 vote: 9.9%
Resolved: Shareholders request that, by April 2007, at reasonable cost and omitting proprietary information, the Board publish a report evaluating the feasibility of a) CVS reformulating all its private label cosmetics products to be free of chemicals linked to cancer, mutation or birth defects, thereby globally meeting the standards set by the EU Cosmetics Directive 2003/15/EC which amended EU Directive 76/768/EEC b) complying with the additional actions sought by the Campaign for Safe Cosmetics as described above, and c) encouraging or requiring manufacturers or distributors of other cosmetics products sold in CVS to ensure that their products comply with the same reformulation and other actions that the company is taking.

ConAgra Foods Inc.
Lead Shareholder: Green Century Capital Management
(withdrawn)
Resolved: Shareholders request that the Board publish a report to the shareholders within six months of the 2006 Annual meeting, at reasonable cost and excluding confidential information, setting forth policy options for Conagra to reduce or eliminate the use of PFOA-related chemicals in product packaging.

Dow Chemical Company (asthma)
Lead Shareholder: Trillium Asset Management
2006 vote: 5.8%
Resolved: Shareholders request that the Board establish an independent panel, controlling for conflict of interest, to publish by May 2007, at reasonable cost and excluding proprietary information, a report analyzing the extent to which Dow products may cause or exacerbate asthma, and describing public policy initiatives, and Dow policies and activities, to phase out or restrict materials linked with such effects.

Dow Chemical Company (chemical security)
Lead Shareholder: Green Century Capital Management
2006 vote: 6.9%
Resolved: Shareholders request that the independent directors of the Board of Dow Chemical prepare a report, at reasonable cost and omitting proprietary information, on the implications of a policy for reducing potential harm and the number of people in danger from potential catastrophic chemical releases by increasing the inherent security of Dow Chemical facilities through such steps as reducing the use and storage of extremely hazardous substances, reengineering processes, and locating facilities outside high population areas. The report should be available to investors by the 2007 annual meeting.

E.I. du Pont de Nemours and Co. (PFOA)
Lead Shareholder: Amalgamated Bank
2006 vote: 28.9%
Resolved: The shareholders of E.I. du Pont de Nemours and Company ("DuPont") urge the Board of Directors to issue a report on PFOA compounds used in Dupont products by the 2007 annual meeting, at reasonable cost and excluding confidential information, evaluating the feasibility of an expeditious phaseout of the use of PFOA in the production of all DuPont products including materials that may degrade to PFOA in use or in the environment, and the development and adoption of safer substitutes.

E.I. du Pont de Nemours and Co. (chemical security)
Lead Shareholder: Green Century Capital Management
2006 vote: 7.7%
Resolved: Shareholders request that the independent directors of the Board of DuPont prepare a report, at reasonable cost and omitting proprietary information, on the implications of a policy for reducing potential harm and the number of people in danger from potential catastrophic chemical releases by increasing the inherent security of DuPont facilities through such steps as reducing the use and storage of extremely hazardous substances, reengineering processes, and locating facilities outside high-population areas. The report should be available to investors by the 2007 annual meeting.

Johnson & Johnson
Lead Shareholder: Citizens Funds
(withdrawn)
Resolved: Shareholders request that the Board of Directors prepare a report on the status of J&J's use of chemicals banned by EU Directive 2003/15/EC in the company's products sold to non-EU markets, the feasibility of implementing a global reformulation plan, and the costs and timeframe for global reformulation. The report, prepared at reasonable cost and omitting proprietary information, should be made available to shareholders by November 1, 2006.

ServiceMaster Company
Lead Shareholder: Green Century Capital Management
2006 vote: 9.1%
Resolved: The ServiceMaster board shall prepare a report, at reasonable expense and omitting proprietary information, on the feasibility and implications of a policy to discontinue the use of synthetic pesticides at TruGreen Chemlawn, instead substituting natural and non-toxic lawn care services. The report shall discuss the impact of such a policy on our customers, our employees, and the employees of companies providing services to us, and shall be available one year from the 2006 annual meeting date.

Whole Foods Market Inc.
Green Century Capital Management
2006 vote: 10%
Resolved, Shareholders request that by February 2007, at reasonable cost and omitting proprietary information, the Board publish a report evaluating Company policies and procedures for systematically monitoring and reducing consumer and environmental exposure to endocrine-disrupting chemicals, including BPA, and persistent bioaccumulative toxics. The report should summarize the criteria used to evaluate such chemicals, and include options for systematically identifying toxics in stocked products, encouraging suppliers to reduce or eliminate such chemicals and develop safer alternatives, educating WFMI customers about toxics in products, and enhancing WFMI's leadership reputation by routinely reporting on its progress.

Appendix 3

Compendium of 2007 Environmental Health Shareholder Resolution Resolved Clauses

Apple Computer
Lead Shareholder: individual shareholder
Resolved: Shareholders request that the Board publish a report within six months of the 2007 annual meeting, at reasonable cost and omitting confidential information, on the feasibility of adopting a policy of becoming a leader in the use of safe materials, by eliminating persistent and bioaccumulative toxic chemicals, and all types of brominated flame retardants (BFRs) and polyvinyl chloride (PVC) plastics, in all Apple products, including an expeditious timetable to end the use of all BFRs and PVC.

CVS Corporation
Lead Shareholder: Boston Common Asset Management
Resolved: Shareholders request that the Board publish a report to shareholders on CVS policy on cosmetics safety, at reasonable expense and omitting proprietary information, by December 2007. This report should summarize which, if any, product lines or categories sold in CVS stores may be affected by the new cosmetics safety legislation and consumer trends described above, and any new initiatives or actions the management is taking to respond to this public policy challenge.

Dow Chemical Company (asthma)
Lead Shareholder: Trillium Asset Management
Resolved: Shareholders request that the Board establish an independent panel, controlling for conflict of interest, to publish by May 2008, at reasonable cost and excluding proprietary information, a report analyzing the extent to which Dow products may cause or exacerbate asthma, and describing public policy initiatives, and Dow policies and activities, to phase out or restrict materials linked with such effects.

E.I. du Pont de Nemours & Co. (PFOA)
Lead Filer: Amalgamated Bank
RESOLVED: The shareholders of E.I. du Pont de Nemours and Company ("DuPont") urge the Board of Directors to issue a report on PFOA compounds used in DuPont products by the 2008 annual meeting, at reasonable cost and excluding confidential information, evaluating the feasibility of an expeditious phaseout of the use of PFOA in the production of all DuPont products, including materials that may degrade to PFOA in use or in the environment, and the development and adoption of safer substitutes.

E.I. du Pont de Nemours & Co. (cost of PFOA-related pollution from facilities)
Lead Filer: members of United Steelworkers
RESOLVED: Shareholders request the Board of Directors to report by the 2008 shareholder meeting, at reasonable cost and excluding confidential information, its annual expenditures for each year from 1996 through 2006, on attorney's fees, expert fees, lobbying, and public relations/media expenses, relating to DuPont's environmental pollution with PFOA and related fluorocarbon compounds or by dioxins, as well as expenditures on actual remediation of contaminated sites.

E.I. du Pont de Nemours & Co. (chemical security)
Lead Filer: Green Century Capital Management
RESOLVED: Shareholders request that the independent directors of the Board of DuPont prepare a report, at reasonable cost and omitting proprietary information, on the implications of a policy for reducing potential harm and the number of people in danger from potential catastrophic chemical releases by increasing the inherent security of DuPont facilities through such steps as reducing the use and storage of extremely hazardous substances, reengineering processes, and locating facilities outside high-population areas. The report should be available to investors by the 2008 annual meeting.

Hasbro Inc.
Lead Filer: Camilla Madden Charitable Trust
RESOLVED: Shareholders of Hasbro Inc. request the Board of Directors to publish a sustainability report, at reasonable expense and omitting proprietary information, by December 2007.

Mohawk Industries Inc.
Lead Filer: United Methodist Church
(withdrawn)
RESOLVED: The shareholders of Mohawk Industries urge the Board of Directors to issue a report on PFOA and PVC in Mohawk Industries products by the 2008 annual meeting, at reasonable cost and excluding confidential information, discussing the feasibility of an expeditious phaseout of the use of PFOA and PVC in the production of all Mohawk products, including materials that may degrade to PFOA in use or in the environment, and the deployment of safer substitutes.

Scotts Miracle-Gro Co.
Lead Filer: Boston Common Asset Management
RESOLVED: Shareholders request that the Board of Directors report by October 1, 2007, at reasonable cost and excluding confidential information, the company's annual expenditures by category for each year from 1993 to 2005, for attorneys' fees, expert fees, lobbying, and public relations/media expenses, relating to efforts to oppose local policies to limit lawn care product use.

Sears Holdings Corp.
Lead Filer: Evangelical Lutheran Church of America
(withdrawn)
RESOLVED: Shareholders request the Board of Directors to publish at reasonable expense and omitting proprietary information, a Sustainability Report.

A summary of the report should be provided to shareholders by December 2007.

Servicemaster Company
Lead Filer: Green Century Capital Management
RESOLVED: Shareholders request that the ServiceMaster board shall prepare a report, at reasonable expense and omitting proprietary information, on the feasibility and implications of a policy to discontinue the use of synthetic pesticides at TruGreen Chemlawn, instead substituting natural and non-toxic lawncare services. The report shall discuss the impact of such a policy on our customers and our employees, and shall be available by November 1, 2007.

Resource Appendix

Investor Environmental Health Network:

www.iehn.org
Richard A. Liroff, Ph.D. 703 243-0085, info@iehn.org

IEHN Members

Adrian Dominican Sisters
http://www.adriansisters.org

As You Sow Foundation
http://www.asyousow.org/csr/shareholder.shtml

Boston Common Asset Management, LLC
http://www.bostoncommonasset.com/

Calvert Group, Ltd.
http://www.calvert.com/sri_648.html

Citizens Advisors, Inc.
http://www.citizensfunds.com/

Domini Social Investments, LLC
http://www.domini.com/

Green Century Capital Management, Inc.
http://www.greencentury.com/

Harrington Investments, Inc.
http://www.harringtoninvestments.com/

Inhance Investment Management, Inc.
http://www.realassets.ca/web_impact/engagement.html

Maryknoll Sisters
http://www.maryknoll.org/MARYKNOLL/SISTERS/missn.htm

Mercy Investment Program
http://www.mercyinvestment.com/csr.html

Newground Social Investment
http://www.newground.net

Pax World Funds
http://www.paxworld.com/02_advocacy.htm

Rose Foundation for Communities and the Environment
http://www.rosefdn.org/

Sierra Club Mutual Funds
http://sierraclubfunds.com/advocuraffairs.htm

Sisters of Mercy, Regional Community of Detroit
http://www.mercydetroit.org/

Trillium Asset Management Corporation
http://www.trilliuminvest.com/

Trinity Health
http://www.trinity-health.org/

Papers and Reports

Benchmarking Corporate Management of Safer Chemicals in Consumer Products - A Tool for Investors and Senior Executives by Richard A. Liroff. Corporate Environmental Strategy: International Journal for Sustainable Business Vol. 12, Issue 1 (January/February 2005) available at www.rosefdn.org/cesreport.pdf and via www.iehn.org.

This report provides investors and senior corporate executives with a tool for measuring corporate progress in producing safer consumer products. The report also offers vignettes of cutting edge actions by major companies to reduce the toxic chemicals in their products.

United Nations Principles for Responsible Investment http://www.unpri.org/principles/

Some 50 institutional investors globally representing $4 trillion in assets have signed on to the Principles, which promote the consideration of environmental, social and governance factors.

A Legal Framework for the Integration of Environmental, Social and Governance Issues Into Institutional Investment Freshfields Bruckhaus Deringer, UNEP Finance Initiative, October 2005. http://www.unepfi.org/publications/investment/index.html

This study, done on behalf of the United Nations Environment Programme's Finance Initiative (UNEP FI), finds that the integration of environmental, social and governance (ESG) issues into investment analysis, so as to more reliably predict financial performance, is clearly permissible and is arguably required in all jurisdictions.

Perspectives on Responsible Investment: A Survey of US Pension Plans, Foundations and Endowments, And Other Long-Term Savings Pools, Jane Ambachtsheer, Mercer Investment Consulting, January 2006 www.merceric.com/usrisurvey

This survey finds that 75% of investors believe that environmental, social, and corporate governance (ESG) factors can be material to investment performance (representing the views of 183 US institutional investors responsible for over US $500 billion in assets under management). Roughly a quarter of respondents plan to increase their proxy voting and shareholder engagement activity over the coming two years.

The Prudent Investor: the Evolution of the Long-Term Investor by Jed Emerson and Tim Little, with Jonas Kron, The Rose Foundation September 2005. http://www.rosefdn.org/prudenttrustee.pdf/

This paper presents an overview of the evolution of the concept of the "prudent man" rule, makes the case for long-term investing, begins to identify long-term risks and rewards fiduciaries or their investment managers must consider when investing over the long-term, addresses several questions regarding the legality of considering sustainability issues within an investment context, and concludes by discussing the importance of aligning the interests of the investment manager with the asset owners.

Fooling Investors & Fooling Themselves: How Aggressive Corporate Accounting & Asset Management Tactics Can Lead to Environmental Accounting Fraud, Sanford Lewis and Tim Little, Rose Foundation. July 2004. http://www.rosefdn.org/fooling.pdf

This report demonstrates that in much the same way that various off-balance-sheet arrangements and other financial manipulations were made infamous by Enron, Worldcom, Global Crossing and others, various devices currently are widely used by corporations to avoid quantification of environmental liabilities – in many cases artificially inflating the market's assessment of a company's shareholder value.

Environmental Fiduciary: The Case for Incorporating Environmental Factors into Investment Management Policies Tim Little, Susannah Goodman and Jonas Kron. Rose Foundation August 2002. http://www.rosefdn.org/images/EFreport.pdf

In this report, the authors show that fiduciaries who manage funds for institutional investors such as pension funds, foundations, and charitable trusts should incorporate environmental factors into their portfolio management policies. They show how a corporation's ability to profit from environmental innovations and prepare for future environmental risks and exposures can have a significant impact on corporate earnings potential, cash flow, and growth opportunities. Consequently, they argue that fiduciaries for institutional investors should institute financially sound policies to encourage strong corporate environmental performance in the corporations held in their portfolios.

Clean Production

For information on how manufacturing plants and product designers are moving to safer chemicals visit:
www.cleanproduction.org
www.bluegreen.org
www.mbdc.com
www.sustainableproduction.org
www.epa.gov/greenchemistry

Selected Institutions with Proxy Voting Guidelines

(Excerpted from As You Sow, "The Power of the Proxy" [2005])

California Public Employees' Retirement System (CalPERS)
http://www.calpers-governance.org/principles/global/globalvoting.pdf

Connecticut State Pension Funds
http://www.state.ct.us/ott/proxyvotingpolicies.htm

State of Wisconsin Investment Board
http://www.swib.state.wi.us/proxyguide.asp

University of Wisconsin
http://www.uwsa.edu/tfunds/proxyvot.htm

Other Resources

As You Sow Foundation
www.asyousow.org
Conducts shareholder activism campaigns on behalf of institutional and NGO clients and produces annual "Guide to the Upcoming Proxy Season."

The Corporate Library
http://www.thecorporatelibrary.com
Highly-regarded corporate governance materials, news and financial analysis sections.

Corporate Monitoring
http://www.corpmon.com/Vote.htm
Shareholder activism site focusing on selected governance proposals and proposed SEC rule changes.

Council of Institutional Investors
http://www.cii.org/dcwascii/web.nsf/doc/index.cm
Provides general information and investment services to pension funds. They generally do not address social issues.

Friends of the Earth's Green Investments Program
http://www.foe.org
Features excellent online guide to shareholder activism: "Confronting Companies using Shareholder Power." Describes the basics of how to file, how to write a proposal, and strategic considerations when negotiating with companies.

Interfaith Center on Corporate Responsibility
http://www.iccr.org
Produced by the leading organization engaged in shareholder advocacy in the U.S, the site lists all shareholder proposals by religious institutional investors, and distributes issue backgrounders covering subjects like militarism, economic justice, AIDS, energy, genetically engineered foods, sweatshops, and corporate governance.

Proxy Information
http://www.proxyinformation.com
Web site developed by As You Sow Foundation to provide detailed information for investors and analysts on selected shareholder proposals and issues.

Responsible Wealth
http://www.responsiblewealth.com
Provides information on a variety of shareholder initiatives focusing on social equity issues.

Shareholder Action Network
http://www.shareholderaction.org
Features shareholder news and proposals, web resources, pre-written letters to CEOs, extensive links section on corporate accountability, and in-depth information on four targeted campaigns each year. Very extensive web resources with links to many shareholder advocacy sites.

Social Investment Forum
http://www.socialinvest.org
Association of Socially Responsible Investment (SRI) professionals and institutions. Reports on the SRI industry and pivotal initiatives; information on community investing, shareholder advocacy, and screening, and SRI trends and performance.

SocialFunds.com
http://www.socialfunds.com
Provides regular news updates and original journalism on screened investing, shareholder advocacy and community investing. Has a database of shareholder proposals, shareholder news, and SRI activities.

Endnotes

[1] Peter Waldman, "Common Industrial Chemicals in Tiny Doses Raise Health Issue", The Wall Street Journal, July 25, 2005, page A-1.

[2] Elizabeth Weise, "Are Our Products Our Enemy?" USA Today, August 3, 2005, Page D-1.

[3] DuPont's legal and reputational problems are signaled in, e.g., Marian Burros, "As Teflon Troubles Pile Up, DuPont Responds with Ads", The New York Times, February 8, 2006 (www.nytimes.com, accessed February 8, 2006), and Jerry Hirsch, "Safety Concerns May Stick to Teflon," The Los Angeles Times, February 14, 2006, www.latimes.com (accessed February 14, 2006).

[4] See. http://ge.ecomagination.com. GE is doubling its research investment in cleaner technologies by 2010, with a goal of doubling its profits from "Ecomagination" products and services at the same time.

[5] See http://walmartstores.com/GlobalWMStoresWeb/navigate.do?catg=355 (accessed July 11, 2006). Wal-Mart is providing its buyers with incentives and is developing scorecards to encourage suppliers to provide environmentally preferable products. See also Wal-Mart's preferred substances policy, www.walmartfacts.com/articles/4556.aspx (accessed January 8, 2007)

[6] Landrigan, P. J., C. B. Schechter, et al. (2002). "Environmental Pollutants and Disease in American Children: Estimates of Morbidity, Mortality, and Costs for Lead Poisoning, Asthma, Cancer, and Developmental Disabilities." Environmental Health Perspectives 110(7): 721-728.

[7] Massey, R. and F. Ackerman (2003). "Costs of Preventable Childhood Illness: The Price We Pay for Pollution." GDAE Working Paper 03-09.

[8] Davies, K. (2005). "How Much Do Environmental Diseases and Disabilities Cost?" Northwest Public Health.

[9] Kathleen Schuler et al, "The Price of Pollution: Cost Estimates of Environment-Related Childhood Disease in Minnesota," (Minneapolis and St. Paul, Minnesota: Institute for Agriculture and Trade Policy and the Minnesota Center for Environmental Advocacy, 2006), available at http://www.environmentalobservatory.org/library.cfm?refid=88337.

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[11] See www.childenvironment.org.

[12] See, e.g., K.A. Boisen, et al, "Are Male Reproductive Disorders a Common Entity: The Testicular Dysgenesis Syndrome", Annals of the New York Academy of Sciences 948:90-99 (2001)

[13] The Endocrine Disruption Exchange, Inc. (TEDX, Inc.) has compiled statistics of these studies by searching the PubMed data base. According to TEDX's unpublished statistics, BFR studies went from 4, 17 and 21 during 1998-2000, to 54, 56 and 88 during 2002-2004.

[14] For discussion of brominated flame retardant (BFR) science, see Birnbaum LS, Staskal DF. "Brominated Flame Retardants: Cause for Concern?" Environmental Health Perspectives 112:9-17 (2004). See also, Sarah Janssen, "Brominated Flame Retardants: Rising Levels of Concern" (Arlington, Virginia: Health Care Without Harm, 2005), available at http://www.noharm.org/details.cfm?type=document&ID=1095 (accessed July 11, 2006).

[15] Unpublished data from The Endocrine Disruption Exchange (TEDX, Inc.), based on a search of the PubMed database of scientific literature, shows studies of PFOS and PFOA increasing from 9, 10 and 18 annually between 1999 and 2001 to 35, 56 and 63 annually between 2002 and 2004. For a summary of the growing number of regulatory actions, see Sanford Lewis "The Shareholder's Right to Know More—2006 Update—Despite DuPont's Recent Concessions to EPA, Shareholder Value Remains at Risk from PFOA", published by DuPont Shareholders for Fair Value and accessible at http://www.ohiocitizen.org/campaigns/dupont_c8/marketreport.pdf (accessed July 11, 2006).

[16] S.E. Lindberg et al., (2001) "Methylated Mercury Species in Municipal Waste Landfill Gas Sampled in Florida." Atmospheric Environment vol. 35, pp. 4011-4015.

[17] See Andreas Sjödin et al., "Retrospective Time-Trend Study of Polybrominated Diphenyl Ether and Polybrominated and Polychlorinated Biphenyl Levels in Human Serum from the United States," Environmental Health Perspectives 112:6 (May 2004), pp. 654-658. Some sources have suggested that concentrations in breast milk are rising exponentially, doubling every five years; see Kellyn S. Betts, "Rapidly Rising PBDE Levels in North America," Environmental Science and Technology Science News online (December 7, 2001), available at http://pubs.acs.org/subscribe/journals/esthag-w/2001/dec/science/kb_pbde.html, viewed April 2005.

[18] Arnold Schechter et al., "Polybrominated Diphenyl Ethers (PBDEs) in US Mothers' Milk," Environmental Health Perspectives 111:14 (November 2003), pp. 1723-1729.

[19] Alexandra McPherson, Beverly Thorpe, and Ann Blake, "Brominated Flame Retardants in Dust on Computers: the Case for Safer Chemicals and Better Computer Design," (Clean Production Action, June 2004).

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[21] See Institute of Medicine, "Costs of Environment-Related Health Effects: A Plan for Continuing Study." Washington, DC: National Academy Press, 1981; Fahs et al., "Health Costs of Occupational Disease in New York State," American Journal of Industrial Medicine 16 (1989), 437-449; Leigh et al., "Costs of Occupational Injuries and Illnesses," Archives of Internal Medicine 157 (1997), 1557-1568. Cited in Leonardo Trasande, Philip J. Landrigan, and Clyde Schechter, "Public Health and Economic Consequences of Methyl Mercury Toxicity to the Developing Brain," Environmental Health Perspectives 113:590-596 (2005).

[22] World Health Organization (WHO), Preventing Disease through Healthy Environments; Towards an Estimate of the Environmental Burden of Disease (World Health Organization, 2006), available at http://www.who.int/quantifying_ehimpacts/publications/preventingdisease/en/index.html.

[23] WHO 2006, Chapter 2: "What is the Environment in the Context of Health?" available at http://www.who.int/quantifying_ehimpacts/publications/preventingdisease2.pdf.

[24] WHO 2006, Chapter 5: "Analysis of Estimates of the Environmental Attributable Fraction, by Disease," available at http://www.who.int/quantifying_ehimpacts/publications/preventingdisease5.pdf.

[25] Kirk R. Smith et al., "How Much Global Ill Health is Attributable to Environmental Factors?" Epidemiology 10:5 (1999), 573-584.

[26] State-specific calculations have been developed for birth defects in Massachusetts (Massey and Ackerman, 2003) and for all three of these categories in the state of Washington (Davies, 2005); these can be consulted as additional examples of the types of calculations that are possible.

[27] Landrigan et al. 2002: 721-2.

[28] Kate Davies, "How Much Do Environmental Diseases and Disabilities Cost?" Northwest Public Health Fall/Winter 2005 (www.nwcphp.org/nph).

[29] Ted Schettler et al. "In Harm's Way: Toxic Threats to Child Development," (Boston, MA: Greater Boston Physicians for Social Responsibility, 2000) pages 2-6, 59-94.

[30] CPI inflation calculator 1997:2006 = 1.24.

[31] National Heart, Lung, and Blood Institute (NHLBI), Fact Book Fiscal Year 2005 (NHLBI, February 2006), p. 55. Available at http://www.nhlbi.nih.gov/about/05factbk.pdf.

[32] See, for example, "Blood and Hair Mercury Levels in Young Children and Women of Childbearing Age – United States, 1999," Morbidity and Mortality Weekly Reports 50:8 (March 2, 2001), 140-3.

[33] Leonardo Trasande, Philip J. Landrigan, and Clyde Schechter, "Public Health and Economic Consequences of Methyl Mercury Toxicity to the Developing Brain," Environmental Health Perspectives 113:590-596 (2005).

[34] KS Korfmacher, "Long-term Costs of Lead Poisoning: How Much Can New York Save by Stopping Lead?" University of Rochester 2003. http://www.leadsafeby2010.org/articles/longtermcosts.htm; M. Stefanak et al., "Costs of Child Lead Poisoning to Taxpayers in Mahoning County, Ohio," Public Health Reports 2005; 120: 311-315. Cited by Davies.

[35] These figures are based on analyses of proposed budgets, and do not necessarily reflect the final budget for the year in question. Analysis of the 2002-03 Budget Bill: http://www.lao.ca.gov/analysis_2002/education/ed_14_Special_Education_anl02.htm;
Legislative Analyst's Office, Analysis of the 2005-06 Budget Bill, February 2005: http://www.lao.ca.gov/analysis_2005/education/ed_08_Special_Education_anl05.htm

[36] American Cancer Society, "Cancer Facts and Figures 2006," available at http://www.cancer.org/downloads/STT/CAFF-2006PWSecured.pdf.

[37] National Heart, Lung, and Blood Institute (NHLBI), Fact Book Fiscal Year 2003 (NHLBI, February 2004), p. 53. Available at http://www.nhlbi.nih.gov/about/03factbk.pdf.

[38] The figures presented here are based on the following information. All figures are given here in 2006 dollars. Figures may vary slightly due to rounding. Asthma: Landrigan et al. estimated national costs of childhood asthma in 1997 at about $5.7 billion for hospital care and physicians' services, including medications; $2.21 billion in school days lost; and $0.24 billion in premature deaths. For our analysis, we use the figures for medical care and school days lost, but omit the values for premature deaths. We derive state-level estimates by applying the percentage of the national population found in each state of interest, and apply the environmentally attributable fractions estimated by Landrigan et al. Cancer: For this calculation, we use national costs of adult and childhood cancer estimated by the National Heart, Blood, and Lung Institute (NHBLI) for 2005. NHBLI estimated these costs at about $78 billion in direct treatment and care costs, nearly $18 billion in indirect morbidity costs, including lost productivity; and about $110 billion in premature mortality costs, including lost productivity. Again, we apply the percentage of the national population found in each state of interest. For the environmentally attributable fraction, we use the conservative figures developed by Landrigan et al., although these estimates refer specifically to children's cancers. Neurobehavioral disorders: Landrigan et al. estimate the national costs of three categories of neurobehavioral disorders in children (mental retardation, cerebral palsy, and autism, excluding cases associated with lead exposure) at $114 billion annually. We apply the state population percentages and the Landrigan et al. EAFs to this figure. Neurobehavioral disorders caused by lead exposure: Landrigan et al. estimate national costs at about $53.8 billion annually in 2006 dollars. We apply the state population percentages to this national figure. For this category, 100% of the effect is environmentally attributable.

[39] See Richard Clapp, et al., "Environmental and Occupational Causes of Cancer: A Review of Recent Scientific Literature," (Lowell, MA: Lowell Center for Sustainable Production, University of Massachusetts, Lowell, 2005). Available at http://www.sustainableproduction.org/downloads/CausesCancer.pdf.

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[41] Reinhold Ruhl and Henning Wriedt, "An Assessment of the Benefits With REACH," 2004.

[42] Michael P. Wilson, "Green Chemistry in California: A Framework for Leadership in Chemicals Policy and Innovation", (Berkeley, CA: California Policy Research Center, University of California, 2006). Special report prepared for the California Senate Environmental Quality Committee and the California Assembly Committee on Environmental Safety and Toxic Materials. Information cited here begins on p. 33 of the report.

[43] Massachusetts Toxics Use Reduction Program, "Evaluating Progress: A Report on the Findings of the Massachusetts Toxics Use Reduction Program Evaluation" (March 1997).

[44] In many cases, companies report on savings achieved through reducing toxics in combination with savings derived from energy efficiency and recycling, so it can be somewhat challenging to break out "toxics only" numbers. Readers interested in this topic may want to consult Goodman, Kron, Little, "The Environmental Fiduciary: The Case for Incorporating Environmental Factors into Investment Management Policies," (Rose Foundation, 2002). Available on-line at the Environmental Fiduciary Project section of the Rose Foundation website, www.rosefdn.org.

[45] See www.globalreporting.org.

[46] Pickvance, Simon et al. 2005. "The Impact of REACH on Occupational Health, with a Focus on Skin and Respiratory Diseases", University of Sheffield, UK: Report prepared for the European Trade Union Institute for Research, Education and Health and Safety.

[47] "Sherwin-Williams Stung by Ruling", available at www.marketwatch.com (accessed April 28, 2006).

[48] "Asbestos Costs US Companies $70 Bln So Far: RAND", Reuters, February 6, 2004, available at www.forbes.com (accessed February 8, 2004).

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[50] Enpro Industries, Inc. Form 10-K, March 7, 2006, page 34.

[51] Details of Halliburton's disclosures related to its acquisition of Dresser Industries, Dow's disclosure of a $2.2 billion asbestos liability associated with its acquisition of Union Carbide, and Kaiser's underestimation of its asbestos liabilities are found in Lewis and Little, supra, pages 25-27.

[52] These developments are summarized in Sanford Lewis for DuPont Shareholders for Fair Value, "The Shareholder's Right to Know More (2006 Update): Despite DuPont's Recent Concessions to EPA, Shareholder Value Remains at Risk from PFOA" available at http://www.ohiocitizen.org/campaigns/dupont_c8/marketreport.pdf.

[53] See http://www2.dupont.com/PFOA/en_US/index.html.

[54] Merck Press Release, "Merck Announces Strong Financial Results for the Second Quarter 2006", July 24, 2006.

[55] Merck and Company, Inc Form 10-Q, filed May 9, 2006, page 13.

[56] Press release issued by New York State Controller's Office, Hevesi Sues Merck & Co. Inc. Over New York Pension Fund Losses Related to Vioxx, November 30, 2004.

[57] Id. Statement by New York State Controller Alan Hevesi.

[58] See Merck's Vioxx website, www.learnaboutvioxx.com.

[59] "Refinery's Ex Owner Requests Shift to Arbitration" Contra Costa Times, Sunday, February 8, 2004. For additional details, see Lewis and Little, supra, page 14.

[60] Tesoro Refining vs. Tosco Corporation, Superior Court of California, County of Contra Costa, Case MSC03-02901 (filed November 14, 2003).

[61] For a detailed discussion of risks posed by historical toxic contamination, and mechanisms used by companies to minimize shareholder scrutiny of these liabilities see Lewis & Little, supra.

[62] See www.acountingobserver.com for a full list of 2005 restatements.

[63] www.cfo.com/blogs, 6/21/06.

[64] Wharton advertisement in The Economist, August 20, 2005, page 69.

[65] See "Cosmetics Companies Shun Contentious Chemical", The Wall Street Journal, January 14, 2005, page B2, and The New York Times, February 3, 2006, page A5.

[66] This description of the Sony matter is adapted from Richard A. Liroff, "Benchmarking Corporate Management of Safer Chemicals in Consumer Products—A Tool for Investors and Senior Executives", Corporate Environmental Strategy: International Journal for Sustainable Business, Vol. 12, No. 1 (January/February 2005), available at www.rosefdn.org/cesreport.pdf and www.iehn.org.

[67] "Green Cleaning Product Procurement Policies, Initiatives and Requirements in the U.S.", available at www.issa.com (accessed June 9, 2006).

[68] Kaiser-Permanente's Kathy Gerwig described their policy in remarks at the CleanMed 2004 conference, available on-line via www.noharm.org (accessed June 8, 2004).

[69] The carpet company's action is described in Melita Marie Garza, "Health-Care Firms Push to Heal Their Buildings," Chicago Tribune, June 20, 2004.

[70] Construction Specialties, Inc. Press Release, September 29, 2005.

[71] Catholic Healthcare West Press Release, "CHW Switches to PVC/DEHP-Free Products to Improve Patient Safety and Protect the Environment," November 21, 2005.

[72] Premier Press Release, "Premier Launches Web-Based Resource for Environmentally Friendly Management and Disposal of Hospitals' Computers and Electronics", February 21, 2005.

[73] See www.consorta.com/suppliers/supplier_epp.asp.

[74] A Legal Framework for the Integration of Environmental, Social and Governance Issues Into Institutional Investment, Fall 2005. available at unepfi.org/fileadmin/documents/freshfields_legal_resp_20051123.pdf.

[75] Virginia L. Gibson, Bonnie K. Levitt, and Karine H. Cargo, "Overview of Social Investments and Fiduciary Responsibility of County Employee Retirement System Board Members In California", 16 November 2000 (on file with author).

[76] See http://www.unpri.org/ (accessed July 11, 2006).

[77] See Mike Tyrrell et al, "Sustainable Investable Themes—A Guide to the Environmental and Social Factors Affecting Each Industry Sector", (London: Smith Barney European Equity Research, 2005).

[78] See Global Energy: Sustainable Investing in the Energy Sector (2005), cited in William Baue, "Spreading SRI: Goldman Sachs Adds Its Own Twist in Social and Environmental Assessment", published at www.socialfunds.com, October 5, 2005.

[79] UBS's work is discussed in William Baue, "SRI Research from UBS Strikes Balance Between Ethics and Economics," published at www.socialfunds.com, October 28, 2005.

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[82] Freshfields, supra., page 110.

[83] Scott on Trusts 227.17 emphasis added.

[84] See e.g. 29 CFR 2550.404a-1, ERISA investment duties and UPIA.

[85] 7 CFR §§ 240.12b 2; 240.12b-20; 230.10b-5(b); 2101.1-02(o); 240.4-01(a); and 240.4-02. See also, Basic Inc. v. Levinson, 485 U.S. 224 (1988).

[86] Letter from Department of Labor to Helmuth Fandl, Chairman of the Retirement Board of Avon Products, Inc. (Feb. 23 1988) ("Avon Letter") at 393; 59 Fed. Reg. 38860.

[87] Ball Signals Continued Commitment to Proxy Voting Issues at Department, 17 Pens. & Ben. Rep. (BNA) 207 (Jan. 29, 1980) (statement of David George Ball, then Assistant Secretary of Labor for Pension and Welfare Benefits Administration).

[88] 29 C.F.R. 2550.404a-1(b).

[89] UPIA section 2 commentary.

[90] Restatement (Third) of Trusts, P.I.R. § 227 cmt. d (1992).

[91] Donovan v. Cunningham, 716 F.2d 1455, 1474 (5th Cir. 1983), cert. denied, 467 U.S. 1251 (1984).

[92] See www.incr.com.

[93] Great Lakes Chemical Corporation Press Release, "Thanks to New Product Technology, Great Lakes Chemical Corporation Announces It Will Cease Production of Penta-PBDE Flame Retardant by End of 2004", November 3, 2003.

NOTES

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