

Pollution Control and Sustainable Industry

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Environmental lawyers tend to see sustainable development either as synonymous with environmental law or as utterly different. Both views contain a grain of truth. Environmental laws in the United States have helped us move toward sustainable development. But if we take sustainable development seriously, it will transform our environmental laws.

This article outlines what sustainable development means when applied to industry, the necessity for sustainable industry, and how sustainable industry can change—and is already beginning to change—the debate about pollution control. As we continue to discuss reinvention of environmental regulation, we can refight yesterday's wars with yesterday's weapons and strategies or we can try to understand tomorrow's challenges and prepare accordingly.

Sustainable development has been defined as "socially responsible economic development" that protects "the resource base and the environment for the benefit of future generations." UNITED NATIONS CONFERENCE ON ENVIRONMENT AND DEVELOPMENT, AGENDA 21, § 8.7 (1992). Our pollution control laws have moved the United States *toward* sustainable development. They have made our cities more liveable, our lakes and rivers more suitable for recreation, our workplaces safer, and our air healthier. These laws also have shown that economic growth can occur without corresponding increases in pollution and energy consumption. The release of many pollutants has declined, and the energy required to produce each constant dollar of gross domestic product is almost 30 percent lower than it was in 1973. PRESIDENT'S COUNCIL ON SUSTAINABLE DEVELOPMENT, SUSTAINABLE AMERICA 3 & n.2 (1996). However imperfectly, our current environmental laws have tended to foster aspects of natural resources protection, economic development, and social equity at the same time.

Achieving sustainable development, however, will require massive changes in the industrial sector. "Whereas yesterday's businesses were often oblivious to their negative impact on the environment and today's responsible businesses strive for zero impact," writes Prof. Stuart L. Hart of the University of Michigan

Business School, "tomorrow's businesses must learn to make a positive impact." Hart, *Beyond Greening: Strategies for a Sustainable World*, HARV. BUS. REV., Jan.-Feb. 1997, at 67, 68.

That positive impact is impossible without a dramatic reduction in three things: pollution, materials consumption, and energy consumption. A growing global economy and population provide the underlying reason. The world's population, now estimated at 5.7 billion, will grow to between 7.9 billion and 11.9 billion by 2050. WORLD RESOURCES INSTITUTE, WORLD RESOURCES 1996-1997 at 173 (1996). In the same period, the global economy will grow to between four and five times its present size. WORLD RESOURCES INSTITUTE ET AL., RESOURCE FLOWS: THE MATERIAL BASIS OF INDUSTRIAL ECONOMIES IV-V (1997). As a result, industrialized nations will need to reduce material throughput, energy use and environmental degradation by more than 90 percent by 2040 just to maintain overall impacts at current levels. BUSINESS COUNCIL FOR SUSTAINABLE DEVELOPMENT [now known as the World Business Council for Sustainable Development], GETTING ECO-EFFICIENT 10 (1993).

Order-of-magnitude improvements in pollutant reduction, as well as energy and materials efficiency, are achievable only by looking at industry holistically. The Environmental Law Institute (ELI) published a treatise several years ago that described the environmental laws for particular industries, beginning with the extraction of resources from the environment and ending with the use and disposal or recovery of products and related wastes. ENVIRONMENTAL LAW INSTITUTE, ENVIRONMENTAL LAW FROM RESOURCES TO RECOVERY (1993). The treatise recognizes that economic activities must be viewed comprehensively, even if the laws regulating them do not.

To foster a significantly more sustainable industrial sector, the nation's laws will need to address at least four types of activities in a new and different way: (1) resource extraction, (2) the use of resources in manufacturing products, (3) the use and disposition of products, and (4) consumption. Goals for reductions in pollution as well as energy and materials consumption should be a major feature of these new laws. The task is formidable, to say the least.

The following suggestions illustrate, on an activity-by-activity basis, some of the changes that may be required. Although some of these are more politically

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sensitive than others, they represent the range of issues related to sustainable industry.

Resource Extraction

Many of the environmental, economic, and social impacts of various industrial activities are concentrated in the places where materials are extracted and converted into usable raw materials—in forests, mines, and oil fields. A well-developed body of environmental law exists to regulate most of these activities, although not all of it is environmentally protective.

Sustainable development changes the policy debate about the management of those resources in several important ways. The emphasis on ecological integrity, for example, means that one-species tree plantations are not an appropriate way to manage renewable resources such as forests. In 1995, the U.S. Forest Service published a proposed rulemaking that is intended to incorporate ecosystem management into forest management, and suggested several different options for doing so. 60 Fed. Reg. 18,886 (Apr. 13, 1995). As the agency recognized, and as the battles over protection of endangered species such as the northern spotted owl also show, defining ecological sustainability is no easy task.

The ecological emphasis, in turn, requires the development and enhancement of incentives for private landowners. Most forests are on private land. As a result, sustainable forestry requires that private landowners have incentives to manage their property for both tree products and for other values, such as wildlife and biodiversity, that may not have an apparent economic value. Many forest products companies are already offering to help small private landowners manage their lands for such values, and the U.S. Forest Service is also providing some technical and other assistance for that purpose. Private certification programs, which enable certified companies to advertise their forest products as sustainable, are also growing. Such incentives may or may not be sufficient in the long run.

It is also important to reduce the need for extraction of raw materials as much as possible. In addition to reducing the environmental impact of such activities, reducing extraction of raw materials preserves ecosystems as well as options for future generations. Fortunately, a broad view of manufacturing expands the range of choices available when obtaining materials and energy. In addition to traditional mines and forests, our urban areas are, in a way, mines and forests containing millions of tons of recyclable paper and metals. It is no

accident that some paper mills with deinking capacity are locating in or near major cities. Half the steel now used in the United States for all purposes is recycled.

Finally, and perhaps most significantly, we need to be sensitive to the types of resources that we extract and use. The use of coal and oil and, to a lesser extent, natural gas, produce substantial greenhouse gases. Domestic supplies of these resources may be abundant, but their continued use will exacerbate global warming.

Production

The manufacturing facility is overwhelmingly the focus of conventional pollution controls. A consensus is emerging that our existing pollution control laws for manufacturing have achieved about as much as they can. Conventional regulatory approaches, often described pejoratively as “command and control,” exact a toll on regulated industries. The criticisms are familiar to practitioners: traditional regulation is inflexible and costly, it does not encourage innovation, there is too much paperwork, and so on.

These laws also do not fully protect human health and the environment. They provide no coherent or compelling answer to the most fundamental question of all: Which pollutants should be regulated? About 1,134 pollutants are regulated as toxic or hazardous under at

least one of five statutes—the Clean Air Act, the Resource Conservation and Recovery Act, the Clean Water Act, the Occupational Safety and Health Act, and section 313 of the Emergency Planning and Community Right-to-Know Act (EPCRA). Only forty-nine are regulated under all five, however, and almost 800 are regulated under only one. Dernbach, *The Unfocused Regulation of Toxic and Hazardous Pollutants*, 21 HARV. ENVTL. L. REV. 1 (1997). In other words, virtually every chemical that is regulated as toxic or hazardous in any of these programs is unregulated under one or more of the others.

Each list can be explained in a more or less coherent manner, but there is no rational explanation for the overall result. The lists under each statute were developed at different times by different people using different assumptions about what chemicals should be regulated. In fact, many pollutants presenting significant risks were omitted from lists to keep their size manageable or to reduce costs. The movement of pollutants after they are released—from air to water or land, for example—indicates the futility of listing pollutants based only on the medium into which they are first

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released. Needless to say, inconsistencies among lists are also economically inefficient.

The laws generally limit public reporting of releases to regulated pollutants. Because of the inconsistencies, people living and working near manufacturing facilities cannot obtain a complete understanding of the chemicals released in their neighborhoods. The annual publication of the Toxics Release Inventory (TRI), which is based on releases and transfers of chemicals covered under section 313 of EPCRA, does not solve this problem because the TRI list excludes many chemicals regulated under other programs. In a system that is supposed to be based on risk, ironically, the state or federal environmental agencies that issue permits for these facilities are not fully aware of the chemicals being released.

The debate about reforming pollution controls, unfortunately, has been mostly about means. Much is said about incentives, technology-based requirements, public information, risk, cost-benefit analysis, management systems such as ISO 14000, and enforcement. Very little is said about the goals toward which those particular instruments should be directed. Regulatory reinvention proposals that include goals tend to present them in such vague terms as to be almost useless. EPA's Project XL, for example, promised regulatory flexibility at individual facilities in return for "superior environmental performance." The vagueness of that goal helps explain why there have been so few agreements under Project XL.

Superior environmental performance should be based mainly on three related measures: pollution, materials consumption, and energy consumption. They are related because, for example, pollution represents wasted materials and energy. Pollution prevention, which involves changes in the manufacturing process that prevent pollutants from being created in the first place, saves these resources. Express and ambitious goals for reducing all three would: (1) focus directly on the real issues, (2) require a long-term view, and (3) reflect the need for order-of-magnitude improvements over current performance.

To set goals for reductions in pollution, energy use, and materials use, we need to distinguish between intermediate and final goals, and we need to be realistic about what we can achieve and what we need to achieve. Some companies have set a goal of zero pollutant releases. Such goals are ambitious, but they also reflect a precautionary approach based on our limited understanding of the effects of chemical pollutants. Other companies have set intermediate goals, such as reducing certain pollutants by a specified percentage by a particular date. At industrial facilities, setting and meeting such goals should represent the wave of the future.

The leading companies here, however, are not representative of the rest. The need for compliance with current pollution control laws, which are backed by an impressive array of enforcement tools, tends to push vol-

untary efforts into the background. The use of inconsistent lists for toxic and hazardous pollutants also encourages the release of pollutants in media, or parts of the environment, where they are not regulated. The only effective solution to such problems is new legislation.

The legislation should expressly foster ecologically efficient production through pollution prevention, energy conservation, and other means. It should set, or authorize the setting of, long- and short-term goals for reduction of pollutants, materials consumption, and energy use within particular industrial sectors and at individual facilities. Such goals would be directly related to the performance that is being sought, easily understood by the public, and precise enough to provide a meaningful dialogue among affected parties.

The nation has some important and useful experience setting and meeting environmental goals. In the 1990 Clean Air Act Amendments, for example, Congress set a goal of cutting annual sulfur dioxide emissions to half of 1980 levels by January 1, 2000. 42 U.S.C. §§ 7651(b), 7651b(a)(1). The program Congress established to meet that goal, which provides affected utilities and others with many compliance choices, is working more effectively and at less cost than predicted. Burtraw & Swift, *A New Standard of Performance: An Analysis of the Clean Air Act's Acid Rain Program*, 26 ENVTL. L. REP. (Envtl. L. Inst.) 10,411 (1996)

Congress could build on that experience by, for example, choosing from the EPCRA § 313 chemicals a relatively short list of the most toxic pollutants in multiple media. Congress could then set up a process for developing goals for deep reductions in the generation and release of these pollutants into all media, and for implementing those goals. If existing regulations became an obstacle to accomplishment of these goals, they would be repealed or modified. Such an approach would provide government, industry, and the public with greater experience about implementing pollution prevention on a wide scale. That experience could then be applied to reductions in the generation and release of other chemicals, and eventually to facilitywide permitting programs. This approach should be both less costly and more protective than existing laws.

Such a system would require a means of measuring progress, both at individual facilities and across industry sectors. To fully appreciate the human health and environmental risks caused by pollutants released from and within industrial facilities, however, the public, employees, environmental agencies, and others need to obtain an overall understanding of the pollutants being released. The legislation should thus expand the EPCRA § 313 list to include virtually all pollutants being released in significant amounts, whether they are labeled toxic or not. In addition, energy and materials accounting on an industry-sector basis would provide an overall understanding of what

is occurring, and where efficiency improvements could most readily be achieved.

Such changes would help address another difficult issue—the apparent inequitable distribution of pollutants in communities where the poor and people of color live. Many of those in the environmental justice movement see sustainable development as a way of folding community concerns into the discussion about how manufacturing facilities operate and where they locate. They insist, quite properly, that sustainable development is about equity as well as the economy and the environment.

In the final analysis, sustainable development is perhaps most understandable at the community level—in the places where people live, work, and play. Manufacturing facilities as well as mines and logging operations need to be operated as part of the community in which they are located. The use of stakeholder groups to facilitate discussions about such operations has often been helpful.

Products

Products can pollute, both during proper use and after they are discarded. Products also use energy and materials. The rapid technical obsolescence of personal computers and the approaching retirement of an entire generation of old televisions as high definition television comes into prominence are two of the most obvious examples.

Within environmental law, relatively few products are directly regulated. At the federal level, two of the most prominent are pesticides and motor vehicles. Generally, “products today are designed without regard for their overall impact on the environment.” OFFICE OF TECHNOLOGY ASSESSMENT, GREEN PRODUCTS BY DESIGN 4 (1992). State regulation is also limited. In some states, auto battery retailers must accept an old battery for every one they sell, and auto batteries must be turned over to a legitimate recycler. A few states, such as Michigan, have mandatory refund laws for nonreturnable beverage containers. Many states have mandatory recycling laws for food and beverage containers, paper, cardboard, and other items; however, most used products, including computers, televisions, food packages, and flashlight batteries, wind up in the trash.

Sustainable industry, by contrast, would apply to virtually all products. It simply does not make sense to address the adverse effects of a particular facility without also addressing the effects created by the products made there, especially when the products may create greater problems or be less expensive to control. The wasted

energy and materials, not to mention the public expense of disposal, are other reasons that products need to be included in any analysis of sustainable industry.

The World Business Council for Sustainable Development has identified four goals for sustainability in products: (1) minimize the materials or energy used to make or operate products, (2) design products so that they are recyclable, (3) design products so that they can be reused or have long lifetimes, and (4) in appropriate cases, have more people use the same product. GETTING ECO-EFFICIENT at 31. Other goals include reducing the health and environmental risks presented by certain products and, of course, eliminating unneeded packaging. OFFICE OF TECHNOLOGY ASSESSMENT, FACING AMERICA’S TRASH 100–108, 112–116 (1989). These goals parallel, in more detailed form, goals for reductions in pollution, materials consumption, and energy consumption at industrial facilities.

The President’s Council on Sustainable Development (PCSD) recommended the development of systems for extended product responsibility for all of those involved in the product’s life cycle.

In addition to manufacturers, these would include designers, suppliers, and users of products—anyone else “in a position to practice resource conservation and pollution prevention at lower cost.” SUSTAINABLE AMERICA at 40–43.

Many companies are now designing products that do a better job of furthering these goals. To do so, they use analytical tools known as life-cycle analyses or life-cycle assessments. By using these tools, companies gain an understanding of the pollutants, materials, and energy involved with the product in extraction of raw materials, production, use of the product, and management of the used product. This kind of systematic thinking is essential for sustainable industry.

The most sustainable approach will differ from product to product, but two things seem reasonably clear. First, manufacturers need to have greater legal responsibility for the design of their products and for encouraging more ecologically sound decisionmaking by consumers. It is less clear what form that legal responsibility should take. PCSD suggested that a variety of systems for extended product responsibility be tried, and that laws be based on those that have been successful. *Id.* at 40.

Second, manufacturers should have incentives to reduce the energy and materials use of their products as well as the pollution these products can create. The use of ecolabeling systems for products, for example,

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would put greater market pressure on companies to produce products that used less energy and materials.

Consumption

From a sustainable development perspective, high consumption levels do not simply provide the background against which other problems must be addressed; consumption itself is the problem. According to *Agenda 21*, the major cause of the continued deterioration of the global environment “is the unsustainable pattern of consumption and production, particularly in industrialized countries.” *AGENDA 21* § 4.3.

If the planet develops to U.S. levels of consumption, the environmental stresses, as well as economic and social disruption, are likely to be overwhelming for everyone. With 5 percent of the world’s population, the U.S. was responsible for 24 percent of the world’s energy consumption and almost 30 percent of the world’s raw materials consumption in 1993. *SUSTAINABLE AMERICA* at 5 & n.8, 142. Quite simply, 8 billion or more people cannot live sustainably by consuming energy and natural resources at the same level that 260 million Americans currently do. As the PCSD observed, “even slight changes in U.S. consumption patterns” could help move toward sustainability. *Id.* at 143. If developed countries can dramatically reduce their consumption, sustainable economic development is much more likely to occur elsewhere.

Reducing consumption is hard to talk about in the United States because people tend to think about it in terms of limits or doing without things or comforts. Consumption, however, is not about prosperity. Most of the policy debate so far has been about dramatically reducing the pollution, materials, and energy associated with manufacturing and the use of products, not about restrictions on the number and kind of products. Under the Energy Policy and Conservation Act, for example, the Department of Energy recently adopted regulations requiring refrigerators sold in 2001 to use 30 percent less electricity than refrigerators currently sold. 62 Fed. Reg. 21,102 (Apr. 28, 1997).

The likelihood that consumption changes can occur without significant changes in lifestyle, as already indicated, depends on dramatic improvements in eco-efficiency. Thus, a cautious approach would also include nontechnological approaches that more directly affect lifestyles. These include consumer education about the effects of particular products. In addition, if communities were designed more compactly, the use of automobiles might be greatly reduced.

The municipal waste recycling programs that have blossomed across the country over the past decade also provide some reason to believe the American public will tolerate these issues in their daily lives. In Pennsylvania, for example, a mandatory recycling law raised the recycling rate from less than 2 percent in 1989 to 21 percent in 1995. About three-quarters of the

state’s population now live in communities with curbside recycling programs. PENNSYLVANIA DEPARTMENT OF ENVIRONMENTAL PROTECTION, ACT 101 ANNUAL REPORT 1995–96 at 9 (1996).

More basically, psychologists suggest that families, community, health, work, and leisure are more important for personal satisfaction or happiness than consumption. Ekins, *The Sustainable Consumer Society: A Contradiction in Terms?* 3 INT’L ENVTL. AFFAIRS 243 (1991). For those working harder to pay bills resulting from the purchase of more and more things, this point may resonate deeply.

More substantial changes in consumption will likely require changes in taxes and subsidies. These, in turn, may or may not be tolerable to the public. PCSD’s Task Force on Population and Consumption, for example, recommended that the tax burden be shifted away from income and payroll. Taxes, the task force noted, tend to discourage activities being taxed and encourage alternatives. Instead of labor and investment, the task force said, an increasing share of the tax burden should be borne by the use of “natural resources, virgin materials, and goods and services that pose significant environmental risks.” PCSD, *Population and Consumption Task Force Report* 37–41 (1996). Such a change would have massive implications, but the Task Force was emphatic about its importance for sustainable development. “[N]o other single policy step,” it said, “could so effectively and at so low a cost move the country toward more efficient—and eventually sustainable—resource use.” *Id.* at 41.

The sensitivity of this issue is underscored by recalling the unhappy fate of the proposed BTU tax during the first year of the Clinton administration. For that reason, perhaps, the full PCSD recommended that the issue be studied by a separate national commission. *SUSTAINABLE AMERICA* at 45–47. This separate commission has not been appointed. Such stories only underscore the obvious: Efforts to reduce consumption of materials and energy will have to be designed and carried out with great care.

These four elements—extraction, production, products, and consumption—and the goals they entail, indicate that current environmental laws, for all their volume and detail, are relatively superficial; they only scratch the surface of what sustainable industry means.

Two related points need to be emphasized. The first is that government cannot make sustainable industry happen by itself. Unless people and companies make the right decisions on a daily basis, for their own personal or organizational reasons, sustainable development will not occur. Firms, for example, know their manufacturing process and products better than the government does; they engage in more behavior than the government can possibly regulate; and they can respond more quickly to needed changes than the government can. They also know what their customers need, and indus-

try leaders are increasingly sensitive to the importance of providing those services in a sustainable manner. *See, e.g., Interview with Monsanto's CEO, Robert B. Shapiro*, HARV. BUS. REV., Jan.-Feb. 1997, at 79.

The second is that sustainable industry will not occur without governmental leadership. Governmental leadership is necessary not only to set an agenda, but also to put in place the necessary legal reforms. However general and goal-directed the sustainable development laws may be, and however much they may rely on incentives to the private sector, they must still be adopted as legislation or regulations.

On issues of this importance, our government leaders have an obligation to educate the public about our interconnected social, economic, and environmental problems and the choices we face in addressing

them. It is one thing to have discussion among the members of the PCSD and the environmental professionals to whom the Council has reached. The Council's work has shown that people with remarkably different perspectives can forge a vision for a sustainable future, and provided some thoughtful recommendations. But that, by itself, does not reach out to the general public or change things. Recommendations are not actions, and there is little sign that the PCSD recommendations are leading to action.

We need debate and action in all levels of government, in both executive and legislative branches. It is there that much of the real change will occur. Our elected leaders, in other words, must actually lead. When they do that, we can build the real bridge—the sustainable bridge—to the twenty-first century.