

The Next Level of Environmental Protection: Business Strategies and Government Policies Converging on Sustainability

Alan D. Hect

Follow this and additional works at: <http://digitalcommons.wcl.american.edu/sdlp>

 Part of the [Banking and Finance Commons](#), and the [Environmental Law Commons](#)

Recommended Citation

Hecht, Alan D. "The Next Level of Environmental Protection: Business Strategies and Government Policies Converging on Sustainability." *Sustainable Development Law & Policy*, Fall 2007, 19-25, 79-80.

This Article is brought to you for free and open access by the Washington College of Law Journals & Law Reviews at Digital Commons @ American University Washington College of Law. It has been accepted for inclusion in *Sustainable Development Law & Policy* by an authorized administrator of Digital Commons @ American University Washington College of Law. For more information, please contact fbrown@wcl.american.edu.

THE NEXT LEVEL OF ENVIRONMENTAL PROTECTION: BUSINESS STRATEGIES AND GOVERNMENT POLICIES CONVERGING ON SUSTAINABILITY

by Dr. Alan D. Hecht*

INTRODUCTION

The ability to understand current risks and pressures and predict new ones is a prerequisite for developing successful sustainable business strategies and supportive government policies. Today, the future business-government landscape seems clearer than at any time in the past: a good opportunity for business and government to shape the future, rather than react to it. Climate change is only one of many pressures that affect overall business strategies and public policies. The following discussion highlights a broad range of social and environmental goals, including biomass and clean energy, access to safe water and sanitation, protection from chemical toxics, and protection of ecosystem services.

Sustainable development fosters policies that integrate environmental, economic, and social values in decision-making. From a business perspective, sustainable development favors an approach based on capturing system dynamics, building resilient and adaptive systems, anticipating and managing variability and risk, and making a profit.¹ Sustainable development reflects not the trade-off between business and the environment, but the synergy between them.

As discussed in this Article, the movement toward sustainable development is inevitable and has important implications for U.S. Environmental Protection Agency (“EPA”) research, regulations, and policies that together suggest that the next level of environmental protection will arise not only from disincentives to pollute, but also from the positive economic benefits of sustainability.

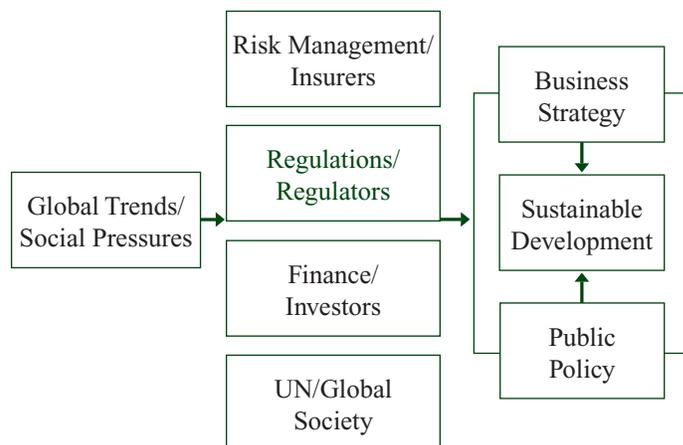
MODELING INTERACTIONS AMONG SOCIETY, BUSINESS, AND GOVERNMENT

A schematic representation of the factors contributing to the convergence of business strategies and government policies toward sustainability appears in Figure 1. The figure’s three columns depict how social and environmental pressures are affecting four groups of stakeholders and policy makers, shaping business strategies and government policies. Each element in Figure 1 is part of a dynamic system with positive and negative feedback loops. In a systems analysis, lines would connect each of the elements, displaying complex feedback among them. This system would have lags and leads as each set of decision makers responds to the others, and would contain non-linear feedback as critical thresholds are reached.

Although my discussion proceeds from left to right in Figure 1, I recognize that current business strategies and public pol-

icies are themselves affecting social and environmental factors, thus creating a closed loop for the whole system. For example, increasing concentrations of greenhouse gases (“GHGs”)—a result of current business and government policies—are affecting insurance practices, corporate strategies, and government policies. Investors and financial managers reacting to climate risks are encouraging companies to reduce their carbon footprint. Government feedback is both positive, e.g., in setting targets for emission reduction or GHG intensity, and negative, e.g., in resisting certain business and/or international pressures.

FIGURE 1: CONVERGENCE OF SUSTAINABLE BUSINESS STRATEGIES AND GOVERNMENT POLICIES



SOCIAL AND ENVIRONMENTAL PRESSURES

Concern for social and environmental well-being affects business strategy and government policies. Table 1 presents current United Nations (“UN”) statistics on distressing social conditions that especially affect the inhabitants of developing countries. The UN Millennium Development Goals² aim to reverse many of the undesirable trends, but progress to date has been uneven.³

* Dr. Alan D. Hecht is Director for Sustainability in the Office of Research and Development at the U.S. Environmental Protection Agency. He is Adjunct Professor of Government at the College of William and Mary; faculty member at Prince of Wales Business and Environment Program, Cambridge University; and External Advisor at the Erb Institute, University of Michigan, and at the Center for Resilience, Ohio State University. Dr. Hecht thanks Gordon Binder, Dave Clark, Terry Davies, Edward Fallon, Marcus Peacock, and John Wise for their helpful reviews and comments. Opinions expressed in this Article are those of the author and do not necessarily reflect official EPA policies.

TABLE 1: STATE OF THE WORLD'S POPULATION⁴

- World population growing by approximately 80 million people per year (9 billion projected total by 2050)
- 2.9 billion living in urban environment (5 billion estimated by 2030)
- 972 million living on less than \$1 per day
- 2.6 billion without access to proper sanitation
- 1.1 billion without access to safe drinking water
- 924 million “slum dwellers” (expected to grow by 27 million per year to 2020)
- 829 million chronically undernourished, including 180 million children
- 790 million lacking health services
- 39 million adults and children living with HIV-AIDS

Michael Porter and Mark Kramer call the impact of these external social conditions on business “outside-in linkages.”⁵ The social distress of the world’s less fortunate people affects not only the stability of nations but business operations, with the result that a company like Unilever, which operates in many developing nations, must find ways to address these issues in order to maintain its “license to operate.”⁶

Such social conditions can also shape future business opportunities. Many social stressors affect those at the “bottom of the economic pyramid”—the four billion people in developing countries with annual income less than three thousand dollars in local purchasing power.⁷ While their individual daily income is very low, these four billion people have aggregate purchasing power of \$5 trillion.⁸ Firms that want to capture this emerging market must adopt socially relevant business strategies.⁹

The health of the environment also affects the behavior of business and government. The need for access to clean water and sanitation and the danger of ecosystem destruction are also powerful drivers. Fifteen of the twenty-four ecosystem services examined by the 2005 *Millennium Ecosystem Assessment* are being degraded or used unsustainably.¹⁰ While the full costs of the loss and degradation of these ecosystem services are difficult to measure, the available evidence demonstrates that the costs are substantial and growing.¹¹ Many of the losses in ecosystem services are a consequence of actions taken to increase the supply of other services, especially food production.¹² These trade-offs often shift the costs of ecosystem degradation from one group of people to another; the greatest costs may be borne by future generations.¹³

Climate change caused by rising concentrations of carbon dioxide in the atmosphere can significantly affect all aspects of human life. The 2007 Intergovernmental Panel on Climate Change (“IPCC”) report makes clear that climate change is largely a result of human activity and that it is likely to have significant social, economic, and security implications.¹⁴ Additionally, a recent study, *National Security and the Threat of Climate Change*, discusses how climate change might act as a threat multiplier in already fragile regions, exacerbating conditions that lead to failed states—the breeding grounds for extremism and terrorism.¹⁵ Such potential threats are driving U.S. lawmakers to consider mandating a national intelligence analysis of security

implications of climate change.¹⁶

Today, the impact of social conditions and environmental pressures manifests in real time. As Internet access grows, so does the public’s ability to access data and respond to it. Public involvement shapes government policies and business practices, making the public one of the important decision makers shown in Figure 1.

If the statistics in Table 1 are not enough of a wake-up call to business and government, then the combined impact of future population growth, urban development, and increased use of materials and energy should be. Over the next fifty years, the world’s population is expected to increase by fifty percent and global economic activity is projected to increase by five hundred percent, while global energy consumption and manufacturing activity are likely to increase at least threefold.¹⁷ All of us must learn how to deal with the consequences of this growth and development.

RISK MANAGERS AND INSURERS

The insurance industry may have a significant impact in implementing sustainable development due to its size, the extent of its reach into the community, and the significant role it plays in the economy.¹⁸ Importantly, unsustainable development is costly and risk managers are paid for avoiding problems. Floods, droughts, earthquakes, hurricanes, and tornados are the expected sources of most insurance losses. Changes in the frequency of such events are critical in anticipating risk. As such, techniques to evaluate and understand future risk are essential. Aiming to describe the new risk landscape, insurers such as Swiss Re have an extensive research program on the early detection and assessment of environmental and health risks.¹⁹ Other insurers have also been leaders in the study of natural catastrophes. For example, Munich Re publishes an annual review of disasters and catastrophes,²⁰ and has set up a foundation dedicated to sharing knowledge connected to the subject of risk.²¹

Munich Re, Swiss Re, and other major insurance and reinsurance firms are bringing new attention to issues of environmental sustainability. In reacting to expected pressures from climate change, these firms are adjusting their rate structures and calling for government action. Additionally, the insurance industry now offers businesses that are committed to sustainable business practices options to reduce their insurance costs.²² Innovative green insurance programs could offer significantly reduced insurance premiums for qualifying companies based on factors such as risk profile, commitment to sustainability, and business needs.

However, while the insurance industry is an important contributor, it cannot address the challenges of climate change on its own. The solution will require concerted effort by all stakeholders. Current and future risk goes well beyond just climate change. In the following sections, I will discuss chemicals and human health. In this area, risk managers are getting help from advances in science and technology that improve our ability to detect risks from new chemicals.²³ Businesses have learned that, if not handled properly, the combination of increased scientific understanding of the health effects of chemicals with public

access to information can seriously threaten any business.

REGULATORS

Environment regulators and business standards are affecting how businesses and society think about sustainability. How are all these players interacting with and responding to social and environmental pressures, and advancing sustainability?

EPA and State Regulations

In the 1960s, social unrest and environmental neglect compelled the Nixon administration—acting more out of political defensiveness than environmental enlightenment—to create the EPA.²⁴ From the 1970s to the 1990s, U.S. environmental legislation grew rapidly, with strong enforcement measures aimed at limiting known pollutants. Today, social and environmental pressures require EPA to address more than just enforcement.

EPA now confronts a suite of issues related to economic growth, demographics and aging, urban development and redevelopment, energy and materials use, non-point sources of pollution, ecosystem destruction, and new chemical and biological risks. In today's world, while regulating dangerous pollution and toxics certainly remains a necessary and vital task, eliminating the use of noxious materials altogether is a better, more sustainable alternative. It is therefore unsurprising that as pressures grow and new risks arise, EPA programs have moved toward life cycle analysis, green chemistry, green design, green engineering, smart growth, and industrial ecology. EPA's changes parallel a new management approach by many businesses that is more system-oriented and gives more attention to what goes into a product rather than simply what the production process emits.²⁵

In the area of waste management, there is a similar shift in thinking from managing waste to managing materials. This new attitude reflects the belief of many EPA programs “that developing new approaches for conserving resources, reducing the amount of toxic materials in society and the toxicity of materials that remain, and managing wastes properly can and should be an important part of responding to [the] challenge of making a more sustainable world.”²⁶

This kind of environmental management calls for the active participation of all stakeholders. In recognition of this need, EPA has begun to promulgate a vision of stewardship and sustainability, recognizing that a sustainable future “cannot be accomplished by government [and regulations] alone; rather it requires the active engagement of all people. To this end, [EPA has] a vision of environmental stewardship—where all parts of society actively take responsibility to improve environmental quality and achieve sustainable results.”²⁷

Sustainability has become a clear part of federal policy,

at least in the management of government buildings and other facilities. In January 2007, President Bush signed Executive Order 13423, entitled “Strengthening Federal Environmental, Energy, and Transportation Management,” that sets goals in the areas of energy efficiency, acquisitions, renewable energy, toxics reductions, recycling, sustainable buildings, electronics stewardship, vehicle fleets, and water conservation.²⁸ Executive Order 13423 explicitly directs heads of federal agencies to implement sustainable practices in these areas, and specifies that “sustainable” means “creat[ing] and maintain[ing] conditions, under which humans and nature can exist in productive harmony, that permit fulfilling the social, economic, and other requirements of present and future generations of Americans.”²⁹ A next step is to ensure that sustainability practices are part of agencies' external programs and policies, so that this concept extends to all federal policies and programs.

Individual states have demonstrated leadership on many environmental and development issues, going well beyond federal policies. Acting through laws, policies, and voting initiatives, states are working with business communities to find sustainable solutions. State-EPA partnerships in this area are important; EPA has worked closely with the Environmental Council of the States (“ECOS”), a non-partisan association of state and territorial environmental agency leaders,³⁰ to advance sustainable practices. With EPA support, ECOS has created a searchable database of regulatory and non-regulatory programs, including projects on energy efficiency, smart growth, pollution prevention, multimedia permitting and inspections, consolidated reporting, small business assistance, and eco-efficiency.³¹

In response to the social and environmental pressures shown in Figure 1, regulators experience both positive and negative feedback. Conflicts between state and federal policies can result from different reactions to given pressures. This kind of conflict led to the 2007 U.S. Supreme Court case concerning whether the Clean Air Act gives EPA the authority to regulate carbon dioxide gas as a pollutant.³² The several states that filed the lawsuit argued that EPA has such authority, while EPA opposed this interpretation. Following the Supreme Court's ruling in favor of the states, EPA faces three options: (1) to make an affirmative judgment that GHGs do cause or contribute to climate change, and “may reasonably be anticipated to endanger public health or welfare;” (2) to make a judgment that GHGs do not have this effect; or (3) to provide “some reasonable explanation as to why it cannot or will not exercise its discretion to make that determination.”³³

On this issue, states and cities are aggressively implementing low-impact development and carbon-reduction policies. The U.S. Council of Mayors adopted a resolution on climate change

Sustainable development fosters policies that integrate environmental, economic, and social values in decision-making.

calling for “the federal government and state governments to enact policies and programs to meet or beat the target of reducing global warming pollution levels to 7 percent below 1990 levels by 2012.”³⁴ As of June 21, 2007, 504 mayors representing over sixty-two million Americans had endorsed this Climate Protection Agreement.³⁵

U.S. Accounting and Corporate Reporting

Environmental regulators are not alone in responding to growing social pressures on business. Disclosure requirements for public corporations have been strengthened significantly in recent years. For example, the Sarbanes-Oxley (“SOX”) Act of 2002, enacted in response to the Enron and WorldCom financial scandals and administered by the Securities and Exchange Commission, protects shareholders and the general public from accounting errors and certain fraudulent business practices.³⁶

Other pressure points promoting transparency in business operations come from the Financial Accounts Standards Board (“FASB”). In March 2005, FASB issued a new interpretation (known as “FIN 47”)³⁷ of its Accounting for Asset Retirement Obligations (“ARO”) standards³⁸ that has prodded firms that had been slow to record obligations for the anticipated expenses needed to retire physical assets in an environmentally safe and sound manner.

These accounting procedures require firms to identify assets such as building sites, mines, chemical plants, and nuclear power facilities that may cause long-term environmental damage and that the firms may be legally required to restore to their original conditions. Firms are now clearly required to recognize those future obligations as they purchase, construct, and use their physical assets. The FASB accounting procedures also require that firms estimate the potential risk and liability of operating facilities that produce environmentally dangerous products. Such life cycle analysis reinforces the movement toward more sustainable management practices, and should help to prevent future contamination, brownfield development, and legal disputes over toxic substances like asbestos.

International: Global Reporting Initiative and the European Union

Additionally, reporting initiatives are growing globally, the broadest of which is the Global Reporting Initiative (“GRI”).³⁹ Initially convened in 1997 by the Coalition for Environmentally Responsible Economies (“CERES”), a non-profit coalition of investor, environmental, religious, labor, and social justice groups, the GRI aimed at extending sustainability reporting to the breadth and rigor of financial reporting.⁴⁰ Today, more than one thousand organizations in sixty countries are using the GRI framework.⁴¹

Reporting similar to the reporting required under the SOX Act of 2002 is required under the EU Directive on Accounts Modernization, which requires companies to report on environmental and social impacts of their operations.⁴² The 2004 EU Transparency Directive “requires companies seeking a stock market listing to disclose risks associated with their capital assets.”⁴³ The 2004 Environmental Liability Directive estab-

lished “a framework for national-level statutes that impose . . . cleanup responsibilities for contaminated” sites.⁴⁴

Responding to growing trends in waste management and toxic chemicals, the EU has enacted several directives with important global environmental implications—including directives for the Restriction of Hazardous Substances (“RoHS”),⁴⁵ Waste Electrical and Electronic Equipment (“WEEE”),⁴⁶ and Registration, Evaluation, and Authorization of Chemicals (“REACH”).⁴⁷ These directives regulate products (input) rather than outputs, manage materials rather than waste, promote use of life cycle assessment and “cradle-to-grave” management, apply green engineering and green chemistry principles, shift the burden of proof to industry, and measure and manage future financial risk and liabilities. Combined with pressures from insurers, risk managers, and ARO accounting, these directives advance the movement to sustainability.

FINANCIAL MANAGERS AND INVESTORS

Environmental and social pressures are pushing bankers, pension fund managers, and individual investors toward more sustainable and socially responsible investing. The Equator Principles require banks to assess the social and environmental impacts of projects that they finance.⁴⁸ Influenced by actions and pressures from groups like the activist Rainforest Action Network, Citigroup has gone beyond the Equator Principles by committing to refuse funding for projects that could result in illegal logging, other environmental damage, or harm to indigenous people.⁴⁹ Such actions demonstrate the potential power of social pressures on business—a key element of the social license to operate.

Research on how Wall Street investors and managers are incorporating environmental and social trends into their investment decisions is showing mixed results, with U.S. investors apparently lagging behind those in Europe and Asia. Senior environmental officials at leading U.S. companies have told EPA staff that they are not getting traction with the investment community. While some capital market transactions, particularly those in which climate change is an issue, take the quality of corporate environmental management into account, such transactions do not constitute a widespread trend.

However, EPA’s assessment of links between environmental performance and fiscal incentives suggest that some progress is occurring: (1) “both investment firms and the companies they invest in are showing greater interest in environmental issues and performance;” and (2) “institutional investors are becoming more active in shaping the direction and practices of the companies they invest in.”⁵⁰

Some of the resistance on Wall Street may reflect the old adage that “the business of business is business.” Change in this perspective is evident from the growth of socially responsible mutual funds and from the evolution of the definition of “fiduciary responsibility” to include environmental risk and performance.⁵¹

The 2007 publication of the *Fiduciary Guide to Toxic Chemical Risk* (co-sponsored by the Investor Environmental Health Network, which represents twenty investment organiza-

tions managing \$22 billion in assets) demonstrates the shift in defining corporate responsibilities.⁵² This guide responds to the growing number of reports about chemicals, foods, and other products that reflect a “growing . . . concern about the impact on human health of relatively small amounts of chemicals in everyday products,”⁵³ and notes 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 fiduciary Duty of Prudence”⁵⁴ and that “fiduciaries have an affirmative duty to consider toxic chemical issues that impact corporate risk, return and shareholder values.”⁵⁵ The guide provides “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.”⁵⁶

If Figure 1 captured all the positive and negative feedbacks in the system, this new interpretation of fiduciary responsibility would be seen as a positive feedback of the changing risk landscape.⁵⁷

UN AND GLOBAL SOCIETY

Since 1972, the UN has been at the center of championing environmental and social issues by collecting data, encouraging national reporting, organizing world conferences and summits, and fostering international agreements. The Rio Earth Summit in 1992 launched Agenda 21, an aggressive international agenda for sustainable development.⁵⁸ A series of UN conferences followed, each focused on different development and social issues. The goal of sustainable development was further advanced in September 2000, when 189 countries adopted the Millennium Development Goals.⁵⁹ Among these goals was the determination: to “[i]ntegrate the principles of sustainable development into country policies and programmes and reverse the loss of environmental resources.”⁶⁰ Two years later at the UN-sponsored International Conference on Financing for Development in Monterrey, Mexico, world leaders agreed on a new approach to development assistance based on shared responsibilities.⁶¹ In September 2002, the World Summit for Sustainable Development (“WSSD”) in Johannesburg, South Africa adopted the “Johannesburg Plan of Action,”⁶² an implementation plan emphasizing basic human needs such as health and access to clean water, as well as agriculture, energy, and biodiversity.⁶³

These UN-rooted activities have focused global attention on a suite of social and environmental issues that are increasingly affecting business strategies and government policies. Interaction among the business sector, government, and civil society has led to the emergence of partnerships within the UN system. These partnerships break with traditional UN approaches by establishing agreements among a modest number of relevant stakeholders aiming to address a concrete problem with a specific timetable and targets.⁶⁴ When the U.S. first proposed the

concept of global partnerships at the WSSD, initial reaction was skeptical, but the number of partnerships has been growing. The UN’s database on partnerships lists over 325 projects,⁶⁵ the largest number being water-related.⁶⁶ The Coca-Cola Company and many other businesses are collaborating with governments, non-government organizations (“NGOs”), and stakeholders.⁶⁷

While UN conferences may not lead to concrete and binding actions, they have elevated public debate on strategic issues and exerted significant pressure for member governments to take action. Concurrent with the growth of UN activities has been the increase in NGOs focusing on environmental and social issues. Today, these organizations are key partners with government and business in efforts to bring clean water, sanitation, clean energy, and medical care to billions of people around the world. NGOs also are exerting considerable pressure on business by using modern satellite and Internet technology. For example, the non-profit group Global Forest Watch uses satellite tracking to monitor logging activities around the world,⁶⁸ often spotting illegal logging in real time. Such capabilities can help governments struggling to control illegal logging, independent certifiers, such as the Forest Stewardship Council,⁶⁹ and multinational wood and product manufacturers, like IKEA, who are committed to using only legally and sustainably harvested products.⁷⁰

CONVERGENCE OF BUSINESS AND GOVERNMENT POLICIES: NEXT STEPS

Clear evidence demonstrates a convergence toward sustainability taking place among major companies in the world today.⁷¹ After interviewing dozens of business

Today, social and environmental pressures require EPA to address more than just enforcement.

leaders for their influential book, *Green to Gold: How Smart Companies Use Environmental Strategy to Innovate, Create Value, and Build Competitive Advantage*, Daniel C. Esty and Andrew S. Winston concluded that smart companies—whom they call “WaveRiders”—were able to respond to the environmental and social pressures shown in Figure 1 by developing a forward-looking and profitable business strategy.⁷² These innovative companies consistently behave in recognizable patterns: (1) anticipating environmental issues and addressing them; (2) staying ahead of new regulatory requirements; (3) managing government mandates to gain advantage in the marketplace; (4) designing innovative or greener products; (5) pushing suppliers to be better environmental stewards; (6) setting metrics and collecting data to track progress; and (7) partnering with NGOs and other stakeholders.⁷³

The business transition that Esty and Winston describe in *Green to Gold* heralds a new era of sustainable business practices. There is a comparable transition underway in U.S. government policy, but at a much slower pace. The government still does not have a sustainability strategy. Nevertheless, several positive steps can be identified that build on current activities and form the basis for a longer-term strategy. Just as progres-

sive businesses are responding to external pressures, EPA can develop and promote a strategy for achieving the next level of environmental protection in the U.S. by taking specific actions: (1) anticipating and responding to future problems; (2) partnering with business; (3) advancing sustainability science and technology; and (4) measuring results and affecting change.

Anticipating and Responding to Future Problems

No one can predict the future, but considering social and environmental stressors clearly operating in today's world and the trends recognizable in the business strategies described in this Article, the argument for an EPA role in advancing sustainability is a strong one. However, if a "sustainability train" is indeed coming, then EPA, as a regulatory agency with historic roots deep in controlling pollution, needs to reflect on and plan how it can foster sustainability. How does an agency organized by offices for specific media (air, water, toxics, and waste) develop an integrated systems approach to environmental protection? Moreover, how does a federal agency without a specific mandate for sustainability advance and achieve sustainable development?⁷⁴

EPA's first step must be a clear strategic plan that coherently connects the dots among existing policies and programs that affect sustainability. For example, many EPA programs—including building design and energy efficiency, urban development and revitalization, green buildings and smart growth, sustainable management of urban systems, sustainable water infrastructure, and improving air quality—cut across EPA's strategic goals and program offices to advance urban sustainability and the built environment.

All of these EPA programs emphasize the goal of sustainable development. Even if the term is not always explicitly used, the concept is clear. These programs and many others have contributed significantly in their own areas of responsibility. Viewed in an integrated manner, these programs together constitute a strategy for urban sustainability. The environmental results of these programs would benefit by better integration among them and a clearer focus on achieving sustainable outcomes.⁷⁵

Partnering with Business

Achieving sustainability has become a mainstream goal for private firms large and small that have responded to simple but forward-thinking questions: Why aim merely to reduce toxic waste when we can eliminate it with new chemicals and processes? Why handle and dispose of growing amounts of waste when we can more efficiently manage materials that eliminate, reduce, or recycle waste? What will be EPA's role in the new era of businesses managing for sustainability?

In working with the regulated community, EPA has followed the four broad approaches highlighted in a 2005 Government Accountability Office report on corporate social responsibility: (1) *Endorsing*, which encompasses policies that encourage or reward sustainable behavior, such as EPA's Energy Star and Design for the Environment programs; (2) *Facilitating*, which involves providing information, funding, or other incentives to advance sustainable practices, such as EPA programs for con-

sumer information, energy and water use, Performance Track, and its new stewardship initiative; (3) *Partnering*, which relies on voluntary and collaborative programs like Climate Protection Partnerships; and (4) *Mandating*, which requires adherence to legislation and executive orders.⁷⁶

Over the next decade, EPA needs to assess how it can best implement each of these approaches. The agency has already made cooperative problem solving and partnerships with business a priority. It will need to explore how best to partner and collaborate with business on many emerging issues and new regulatory concerns: product design, materials use, new technologies, corporate social responsibility, and environmental ethics. This has led EPA to focus on how to help decision makers (including businesses, citizens, and all levels of government and businesses) make more informed and sustainable decisions.

One key barrier to EPA's contribution to sustainable management—the mindset that federal action in the realm of the environment must be restricted to roles explicitly specified in existing regulations—must be recognized and overcome. This mentality reflects in part past history and outmoded business attitudes that burdensome federal regulations unnecessarily curtail economic growth. Such views are changing in some business quarters—such as among companies seeking federal action to limit carbon emissions⁷⁷—but the current debate on climate change and nanotechnology shows that business resistance to controls by agencies like EPA is still deeply embedded. Central to this debate over government's role—and to long-term sustainability—is the growing recognition on nearly all sides that reliance on regulations alone is not the most effective route to advance sustainable outcomes. Regulatory agencies like EPA need to follow a broader mandate to undertake core research to achieve better understanding of interactions among the economy, society, and the environment and to develop tools, models, and approaches that inform public debate and help business make better decisions. Regulatory agencies and industry must work together with evolving mindsets that reflect current risks and challenges for environmental protection.

The successes of the many companies pursuing the goal of sustainability come from the realization that protecting the environment makes good business sense. If the number of articles on green business and of actual changes by management in manufacturing design are reliable measures, then we are approaching the green "tipping point." Many EPA programs have anticipated and contributed to advancing sustainability concepts, e.g., several prominent EPA programs that relate to business in non-regulatory ways, emphasizing business practices ranging from raw materials and manufacturing to waste and recycling.⁷⁸

The key goal of these programs is to shape a new way of manufacturing and doing business that goes beyond controlling pollution to actually changing the strategic thinking of companies. Collectively, these programs demonstrate that the next level of environmental protection will arise not only from disincentives to pollute, but also from the positive vision of sustainability that is acceptable to business operation.

Partnerships between EPA and industry on sustainabil-

ity objectives can provide benefits to both sides. While EPA advances its sustainability goals, access to EPA's reputation and technical skills can be of considerable value to many companies. A prime example is Wal-Mart Stores, Inc. In response to social and environmental pressures, the giant retailer has established a set of "Sustainability 360" objectives, and is working with EPA to pursue those goals and to address issues of product design and energy and materials use.⁷⁹

Sustainability Science and Technology

Science and technology drive change and are critical elements of any sustainability strategy. The science of sustainability aims to go beyond the science needed for setting regulatory policies. Sustainability science anticipates problems, promotes innovation, and aids decision-making. A National Academy of Engineering report has suggested that the path to sustainability "involves the smart design of products, processes, systems, and organizations, and the implementation of smart management strategies that effectively harness technology and ideas to avoid environmental problems before they arise."⁸⁰

Good science is not something anyone would argue against; but it is the science for decision-making part that goes the vital next step. EPA today has a strong scientific foundation in systems research, risk assessment, and life cycle and materials flow analysis, and is working at the frontiers of research in computational toxicology, genomics, ecoinformatics, and nanotechnology. EPA clearly needs to expand these efforts in line with the priorities of a sustainability research strategy.⁸¹

Measuring Results—Affecting Change

EPA is currently measuring environmental quality through a set of environmental indicators, which EPA's *Draft Report on the Environment 2003* defines as measures that "help measure over time the state of air, water, and land resources, pressures on those resources, and resulting effects on ecological condition and human health."⁸² Looking ahead, EPA needs to develop a set of sustainability indicators for policy and public use that will affect strategic planning and inform decision makers inside and outside of government. The proposed EPA budget highlights this challenge: "In FY 2008 EPA's Sustainability research program will embark on a new effort that is aimed at creating a suite of science-based sustainability metrics that are readily under-

stood by the public."⁸³ These measures must become not just a report on the environment but a step in active engagement with all stakeholders. EPA needs greater engagement with a variety of stakeholders to help everyone better understand why measuring something like nitrate levels in surface water is important for everyday life and for sustainable practices.

Developing sustainability indicators will fulfill several valuable roles. It will: (1) assist decision makers in understanding the practical meaning of achieving a sustainable way of life; (2) provide guidance for decision makers in designing and implementing policies and practices to advance sustainability; (3) enable decision makers to see the interconnections among issues so they can understand systems and make better-informed decisions; (4) promote cross-media policies and strategies within EPA; (5) serve as a framework and focus for constructive dialogue and collaboration among business, government, and NGOs; and (6) provide ongoing access to the data and information that support decision making for sustainability.

CONCLUSION

Connecting the dots on the political, government, and business landscapes reveals a convergence of business strategies and government policies toward a more sustainable management of natural resources. It is more obvious now than ever before that the well-being of those both at the top and at the bottom of the economic pyramid cannot continue without sustaining our natural resource base. The next level of environmental protection will be created not only by disincentives to pollute, but also by the positive vision of sustainability that achieves acceptance by and motivates business leaders. This convergence towards sustainability is inevitable and its acceleration through concerted efforts by business, government, and the public will benefit all.

History has shown that EPA's air, water, and land programs have made significant contributions in the agency's areas of responsibility. The environmental results from these programs could significantly improve with greater integration among them and with a clearer focus on achieving sustainable outcomes. So much more is possible to advance environmental sustainability with a strong research focus and a clearer political and policy roadmap. In this way, EPA cannot simply respond to change but can help to create the future.



Endnotes: The Next Level of Environmental Protection

¹ See Joseph Fiksel, *Sustainability and Resilience: Toward a Systems Approach*, SUSTAINABILITY: SCI., PRACTICE, & POL'Y, Fall 2006, at 14-21, available at <http://ejournal.nbio.gov/progress/2006fall/0608-028.fiksel.pdf> (last visited Nov. 7, 2007).

² UNITED NATIONS, THE MILLENNIUM DEVELOPMENT GOALS REPORT 2007, available at <http://mdgs.un.org/unsd/mdg/Resources/Static/Data/2007%20Stat%20Annex%20current%20indicators.pdf> (last visited Nov. 7, 2007) [hereinafter MDG REPORT 2007].

³ World Bank, *A Midpoint Look at Progress on Millennium Development Goals* (July 5, 2007), available at <http://web.worldbank.org/WBSITE/EXTERNAL/N EWS/0,,contentMDK:21398721~pagePK:64257043~piPK:437376~theSite PK:4607,00.html> (last visited Nov. 7, 2007).

⁴ See, e.g., MDG REPORT 2007, *supra* note 2; United Nations Population Division, *World Population Trends*, available at <http://www.un.org/popin/wdtrends.htm> (last visited Nov. 7, 2007); UNITED NATIONS, STATE OF THE WORLD CITIES REPORT 2006-2007 (Stylus Pub., 2006); UNITED NATIONS, WORLD POPULATION PROSPECTS, THE 2006 REVISION 5 (2007), available at <http://www.un.org/esa/population/publications/wpp2006/English.pdf> (last visited Nov. 7, 2007); UNITED NATIONS, WATER, A SHARED RESPONSIBILITY: UN WORLD WATER DEVELOPMENT REPORT 2 at 46 (United Nations Education, Scientific and Cultural Organization 2006), available at <http://unesdoc.unesco.org/images/0014/001454/145405E.pdf> (last visited Nov. 7, 2007).

Endnotes: The Next Level of Environmental Protection
continued on page 79

ENDNOTES: THE NEXT LEVEL OF ENVIRONMENTAL PROTECTION *continued from page 25*

⁵ Michael E. Porter & Mark Kramer, *Strategy and Society: The Link Between Competitive Advantage and Corporate Social Responsibility*, HARV. BUS. REV., Dec. 1, 2006, at 78-92.

⁶ Pete Engardio et al., *Beyond The Green Corporation*, BUSINESS WEEK, Jan. 29, 2007, available at http://www.businessweek.com/magazine/content/07_05/b4019001.htm (calling the world Unilever's laboratory because in Brazil it operates a free community laundry, provides financing for drip irrigation, and recycles seventeen tons of waste; in Bangladesh it funds a floating hospital; in Ghana it teaches sustainable practices to deprived communities; in India it helps women start micro-enterprises; and discloses how much carbon dioxide and hazardous waste its factories produce).

⁷ Allen L. Hammond et al., WORLD RESOURCES INST. AND INT'L FINANCE CORP., THE NEXT 4 BILLION: MARKET SIZE AND BUSINESS STRATEGY AT THE BASE OF THE PYRAMID 3 (2007), available at http://pdf.wri.org/n4b_fulltext_hi.pdf (last visited Nov. 3, 2007).

⁸ Hammond, *id.*

⁹ See C.K. PRAHALAD, THE FORTUNE AT THE BOTTOM OF THE PYRAMID (Wharton School Publishing 2005).

¹⁰ See generally MILLENNIUM ECOSYSTEM ASSESSMENT, ECOSYSTEMS AND HUMAN WELL-BEING: CURRENT STATE AND TRENDS ASSESSMENT (2005), available at <http://www.maweb.org/en/Condition.aspx> (last visited Nov. 7, 2007) [hereinafter MEA].

¹¹ See generally MEA, *id.*

¹² See, e.g., MEA, *id.* at 836.

¹³ See, e.g., MEA, *id.* at 829, 835.

¹⁴ See, e.g., INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, CLIMATE CHANGE 2007: THE PHYSICAL SCIENCE BASIS at 2, 10, 665 (2007), available at <http://ipcc-wg1.ucar.edu/wg1/wg1-report.html> (last visited Nov. 7, 2007).

¹⁵ CNA CORPORATION, NATIONAL SECURITY AND THE THREAT OF CLIMATE CHANGE 44 (2007), available at http://securityandclimate.cna.org/report/SecurityandClimate_Final.pdf (last visited Nov. 3, 2007).

¹⁶ Global Climate Change Security Oversight Act, S. 1018, 110th Cong. (1st Sess. 2007), available at <http://thomas.loc.gov/cgi-bin/query/z?c110:S.1018>: (last visited Nov. 7, 2007); see also Global Climate Change Security Oversight Act, H.R. 1961, 110th Cong. (1st Sess. 2007), available at <http://thomas.loc.gov/cgi-bin/query/z?c110:H.R.1961>: (last visited Nov. 7, 2007).

¹⁷ EMILY MATTHEWS ET AL., THE WEIGHT OF NATIONS: MATERIAL OUTFLOWS FROM INDUSTRIAL ECONOMIES (World Resources Institute 2000).

¹⁸ UNITED NATIONS, INSURING FOR SUSTAINABILITY 13 (May 2007), available at http://www.unepfi.org/fileadmin/documents/insuring_for_sustainability.pdf (last visited Nov. 3, 2007).

¹⁹ Swiss Re has built an extensive research program around detection and assessment of risks. Its Systematic Observations of Notions Associated with Risk research project is an extensive data analysis and systems study that can detect risk signals too weak to show up on the radar screen of a wider audience. See, e.g., SWISS RE, SUSTAINABILITY REPORT 2005 at 12 (2006), available at http://www.swissre.com/resources/4b80c600455c53e19267ba80a45d76a0-Sustainability_Rep_05_en_.pdf (last visited Nov. 3, 2007); SWISS RE, SUSTAINABILITY REPORT 2004 at 9 (2005), available at http://www.swissre.com/resources/112c8080455c6d218f33bf80a45d76a0-Sustainability_Rep_04.pdf (last visited Nov. 3, 2007).

²⁰ See MUNICH RE, NATURAL CATASTROPHES 2006: ANALYSES, ASSESSMENTS, POSITIONS 1 (2007), available at http://www.munichre.com/publications/302-05217_en.pdf (last visited Nov. 3, 2007); see also MUNICH RE, ANNUAL REVIEW: NATURAL CATASTROPHES 2005 (2006), available at http://www.munichre.com/publications/302-04772_en.pdf (last visited Nov. 3, 2007); MUNICH RE, ANNUAL REVIEW: NATURAL CATASTROPHES 2004 (2005), available at http://www.munichre.com/publications/302-04321_en.pdf (last visited Nov. 3, 2007).

²¹ See About Us, Munich Re Foundation, <http://www.munichre-foundation.org/StiftungsWebsite/AboutUs/Overview/> (last visited Nov. 3, 2007).

²² GreenBiz.com, *Domani and Garnet Offer 'Sustainable' Insurance Program* (May 15, 2007), available at http://www.greenbiz.com/news/news_third.cfm?NewsID=35067 (last visited Nov. 3, 2007).

²³ Press Release, U.S. EPA, State-of-the-Art Approach Helps EPA Identify Chemical Risks (Apr. 11, 2007), available at <http://www.epa.gov/ord/newsreleases/newsrelease-041107.html> (last visited Nov. 3, 2007).

²⁴ RICHARD LAZARUS, *THE MAKING OF ENVIRONMENTAL LAW* (Univ. of Chicago Press 2004).

²⁵ The Dow Chemical Company is an example of a company that has adopted sustainable goals, as it aims to “innovate to improve confidence that our products are managed safely throughout their lifecycle and develop products that will make a lasting, positive improvement on the world.” Dow Chemical Company, Our Commitments, 2015 Sustainability Goals, (last visited Nov. 3, 2007).

²⁶ EPA, *BEYOND RCRA: WASTE AND MATERIALS MANAGEMENT IN THE YEAR 2020* at 19 (Apr. 2003), available at <http://www.epa.gov/epaoswer/osw/vision.pdf> (last visited Nov. 3, 2007).

²⁷ EPA INNOVATION ACTION COUNCIL, *EVERYDAY CHOICES: OPPORTUNITIES FOR ENVIRONMENTAL STEWARDSHIP* at 1 (Nov. 2005), available at <http://epa.gov/innovation/pdf/rpt2admin.pdf> (last visited Nov. 3, 2007).

²⁸ Exec. Order No. 13,423, 72 Fed. Reg. 3,919 (Jan. 26, 2007), available at <http://a257.g.akamaitech.net/7/257/2422/01jan20071800/edocket.access.gpo.gov/2007/pdf/07-374.pdf> (last visited Nov. 4, 2007) [hereinafter Executive Order 13243].

²⁹ Exec. Order 13243, *id.* at 3,923.

³⁰ Environmental Council of the States, About ECOS, <http://www.ecos.org> (last visited Nov. 4, 2007).

³¹ See Environmental Council of the States, Innovation and Sustainability in the States, <http://www.ecos.org/content/innovations> (last visited Nov. 4, 2007).

³² *Massachusetts v. EPA*, 549 U.S. 1438 (2007).

³³ Paul E. Hagen, Principal, Beveridge & Diamond, P.C., Introductory Remarks and Course Overview at the ALI-ABA International Environmental Law Conference (Apr. 12, 2007).

³⁴ U.S. Council of Mayors, Resolution Endorsing the U.S. Mayors Climate Protection Agreement, http://www.usmayors.org/uscm/resolutions/73rd_conference/env_04.asp (last visited Nov. 4, 2007).

³⁵ See Environment News Service, *U.S. Mayors Take the Lead in Fighting Climate Change* (June 25, 2007), available at <http://www.ens-newswire.com/ens/jun2007/2007-06-25-04.asp> (last visited Nov. 7, 2007); Anne Underwood, *Mayors Take the Lead*, NEWSWEEK, Apr. 16, 2007, at 68.

³⁶ See generally Sarbanes-Oxley Act of 2002, 15 U.S.C.S. §§ 7201, *et seq.* (2002).

³⁷ FASB, FINANCIAL ACCOUNTING SERIES: FASB INTERPRETATION NO. 47 (No. 266-B) (Mar. 2005), available at <http://72.3.243.42/pdf/fin%2047.pdf> (last visited Nov. 7, 2007).

³⁸ FASB, STATEMENT OF FINANCIAL ACCOUNTING STANDARDS NO. 143: ACCOUNTING FOR ASSET RETIREMENT OBLIGATIONS (June 2005), available at <http://www.fasb.org/pdf/fas143.pdf> (last visited Nov. 7, 2007).

³⁹ GRI, What We Do, <http://www.globalreporting.org/AboutGRI/WhatWeDo> (last visited Nov. 4, 2007).

⁴⁰ GRI, Our History, <http://www.globalreporting.org/AboutGRI/WhatWeDo/OurHistory> (last visited Nov. 4, 2007); Coalition for Environmentally Responsible Economies, About CERES, <http://www.ceres.org/ceres/> (last visited Nov. 4, 2007).

⁴¹ GRI, *supra* note 40.

⁴² See *e.g.*, EPA, FINANCIAL INCENTIVES FOR ENVIRONMENTAL MANAGEMENT SYSTEMS 14 (Dec. 2006), available at <http://www.epa.gov/ems/docs/resources/FinalFinancialIncentivesforEMS%203-07.pdf> (last visited Nov. 4, 2007) [hereinafter FINANCIAL INCENTIVES].

⁴³ FINANCIAL INCENTIVES, *id.*

⁴⁴ FINANCIAL INCENTIVES, *id.*

⁴⁵ EU, Waste Electrical and Electronic Equipment, http://ec.europa.eu/environment/waste/weee/index_en.htm (last visited Nov. 4, 2007) [hereinafter WEEE].

⁴⁶ WEEE, *id.*

⁴⁷ European Commission, REACH, http://ec.europa.eu/environment/chemicals/reach/reach_intro.htm (last visited Nov. 7, 2004) [hereinafter REACH]. RoHS and WEEE “are designed to tackle the rapidly increasing waste stream of electrical and electronic equipment” and complement EU action on landfill and incineration of waste. WEEE, *supra* note 45. The REACH regulation gives industries greater responsibility to manage risks from chemicals and to provide

related safety information. REACH, *supra*. “Manufacturers and importers will be required to gather information on the properties of their substances,” which will help them manage them safely, “and to register the information in a central database.” REACH, *supra*.

⁴⁸ See EQUATOR PRINCIPLES, THE “EQUATOR PRINCIPLES” 2 (July 2006), available at http://www.equator-principles.com/documents/Equator_Principles.pdf (last visited Nov. 7, 2007).

⁴⁹ See, *e.g.*, Citigroup.com, Forestry, <http://www.citigroup.com/citigroup/environment/data/forestry.htm> (last visited Nov. 4, 2007); Citigroup.com, Citi ESRM Approach to Commercial Logging and Primary Processing of Timber, <http://www.citigroup.com/citigroup/environment/data/forestry.pdf> (last visited Nov. 4, 2007); Citigroup, Environmental and Social Risk Management Policy, <http://www.citigroup.com/citigroup/environment/data/esrmpolicy.htm> (last visited Nov. 4, 2007).

⁵⁰ See FINANCIAL INCENTIVES, *supra* note 42, at 13.

⁵¹ Engardio, *supra* note 6 (stating that assets of mutual funds designed to invest in companies meeting social responsibility criteria have increased by \$166 billion between 1995 to 2005 and that institutions, such as charitable trusts and government pension funds, with \$4 trillion in assets “pledge to weight sustainability factors in investment decisions”).

⁵² JANE AMBACHTSHEER ET AL., FIDUCIARY GUIDE TO TOXIC CHEMICAL RISK (Investor Environmental Health Network/Rose Foundation for Communities and the Environment 2007), available at <http://www.iehn.org/filesalt/Fiduciary.pdf> (last visited Nov. 7, 2007) [hereinafter FIDUCIARY GUIDE]; see Investor Environmental Health Network, News, <http://www.iehn.org/?q=node/41> (last visited Nov. 4, 2007).

⁵³ FIDUCIARY GUIDE, *id.* at 3.

⁵⁴ FIDUCIARY GUIDE, *id.* at 6.

⁵⁵ FIDUCIARY GUIDE, *id.*

⁵⁶ FIDUCIARY GUIDE, *supra* note 52, at 3.

⁵⁷ UN ENV’T PROGRAMME FINANCE INITIATIVE, A LEGAL FRAMEWORK FOR THE INTEGRATION OF ENVIRONMENTAL, SOCIAL AND GOVERNANCE ISSUES INTO INSTITUTIONAL INVESTMENT (Oct. 2005), available at http://www.unepfi.org/fileadmin/documents/freshfields_legal_resp_20051123.pdf (last visited Nov. 7, 2007).

⁵⁸ S. Jacob Scherr & R. Juge Gregg, *Johannesburg and Beyond: The 2002 World Summit on Sustainable Development and the Rise of Partnerships*, 18 GEO. INT’L ENVTL. L. REV. 425, 429-430 (2006).

⁵⁹ *E.g.*, Press Release, UN, World Leaders Adopt ‘United Nations Millennium Declaration’ at Conclusion of Extraordinary Three-Day Summit (Sept. 8, 2000), <http://www.un.org/News/Press/docs/2000/20000908.ga9758.doc.html> (last visited Nov. 7, 2007).

⁶⁰ UN, Millennium Development Goals, <http://www.un.org/millenniumgoals/index.html> (select button at left for goal “7: Ensure environmental sustainability”) (last visited Nov. 7, 2007).

⁶¹ See generally UN, Monterrey Consensus on Financing for Development (2002), <http://www.un.org/esa/ffd/Monterrey/MonterreyConsensus.pdf> (last visited Nov. 4, 2007); UN Financing for Development Office, Overview, <http://www.un.org/esa/ffd/indexOverview.htm> (last visited Nov. 4, 2007).

⁶² Scherr & Gregg, *supra* note 58, at 425-27.

⁶³ See Scherr & Gregg, *supra* note 58, at 428; Press Release, UN, Sustainable Development Summit Concludes in Johannesburg: UN Secretary-General Kofi Annan Says It’s Just the Beginning (Sept. 4, 2002), <http://www.un.org/events/wssd/pressreleases/finalrelease.pdf> (last visited Nov. 7, 2007).

⁶⁴ See, *e.g.*, Scherr & Gregg, *supra* note 58, at 425-26, 428, 436, 439-40.

⁶⁵ UN Department of Economic and Social Affairs, Division for Sustainable Development, Partnerships for Sustainable Development—CSD Partnerships Database, http://webapps01.un.org/dsd/partnerships/public/partnerships/title_all_1.html (last visited Nov. 7, 2007) [hereinafter Partnerships Database].

⁶⁶ Partnerships Database, *id.*

⁶⁷ See, *e.g.*, Partnerships Database, *id.*; Homepage, Refrigerants Naturally! website, <http://www.refrigerantsnaturally.com> (last visited Nov. 7, 2007).

⁶⁸ See Interactive Maps, Global Forest Watch website, <http://www.globalforestwatch.org/english/index.htm> (last visited Nov. 4, 2007).

⁶⁹ See About Us, Forest Stewardship Council website, <http://www.fsc.org/en/about> (last visited Nov. 4, 2007).

⁷⁰ See, *e.g.*, IKEA Group, Ikea Actively Works Against Illegal Logging,

http://www.ikea.com/ms/en_US/about_ikea/social_environmental/Forestry.pdf (last visited Nov. 4, 2007).

⁷¹ Engardio, *supra* note 6.

⁷² See generally DANIEL C. ESTY & ANDREW S. WINSTON, GREEN TO GOLD: HOW SMART COMPANIES USE ENVIRONMENTAL STRATEGY TO INNOVATE, CREATE VALUE, AND BUILD COMPETITIVE ADVANTAGE (Yale University Press 2006).

⁷³ ESTY & WINSTON, *id.* at 72.

⁷⁴ Many EPA program offices and regions are independently addressing these questions. For example, the Pollution Prevention program is examining how best to maximize its efforts to contribute to sustainability. Water programs are talking about sustainable water use and connecting the dots with potential impacts from climate change. Air programs have historically shown that conservation and efficiency are undervalued in national energy strategies. Recognizing the need for management efficiency and the air-water-land interface, regulatory programs are moving beyond single-media permitting to explore integrated permitting (a practice being advanced in the UK). Assessing, integrating, and maximizing these diverse activities around sustainability greatly enhance all of them.

⁷⁵ See J. Gray et al., *Integrated Regulation—Experiences of IPPC in England and Wales*, 21 WATER & ENV'T J. 69 (2007), available at <http://www.blackwell-synergy.com/doi/full/10.1111/j.1747-6593.2006.00048.x> (last visited Nov. 4, 2007).

⁷⁶ See, e.g., U.S. GOVERNMENT ACCOUNTABILITY OFFICE, GLOBALIZATION: NUMEROUS FEDERAL ACTIVITIES COMPLEMENT U.S. BUSINESS'S GLOBAL CORPORATE RESPONSIBILITY EFFORTS 23-25 (Aug. 2005), available at <http://www.gao.gov/new.items/d05744.pdf> (last visited Nov. 4, 2007).

⁷⁷ See Eric Lipton & Gardiner Harris, *In Turnaround, Industries Seek U.S. Regulations*, N.Y. TIMES, Sept. 16, 2007, at 1, available at <http://www.nytimes.com/2007/09/16/washington/16regulate.html> (last visited Nov. 4, 2007).

⁷⁸ These include supply chain and manufacturing programs, such as: Green Suppliers Network, <http://www.greensuppliers.gov/gsn/page.gsn?id=about> (last visited Nov. 4, 2007); Lean Manufacturing and Environment, <http://www.epa.gov/innovation/lean/index.htm> (last visited Nov. 4, 2007); Design for the Environment, <http://www.epa.gov/dfepubs/projects/index.htm> (last visited Nov. 4, 2007); Clean Processes, <http://www.epa.gov/ORD/NRMRL/std/cppb/index.html> (last visited Nov. 4, 2007); Green Chemistry Program, <http://www.epa.gov/greenchemistry/> (last visited Nov. 4, 2007); Nanoscale Materials

Stewardship Program, <http://www.epa.gov/oppt/nano/#stewardship> (last visited Nov. 4, 2007); Nanotechnology, <http://es.epa.gov/ncer/nano/> (last visited Nov. 4, 2007); and the National Partnership for Environmental Priorities Program, <http://www.epa.gov/epaoswer/hazwaste/minimize/npep/index.htm> (last visited Nov. 4, 2007); and management and performance programs, such as: the Sector Strategies Program, <http://www.epa.gov/sectors/> (last visited Nov. 4, 2007); National Environmental Performance Track, <http://www.epa.gov/performance/track> (last visited Nov. 4, 2007); the Sustainable Futures Initiative, <http://www.epa.gov/oppt/newchems/pubs/sustainablefutures.htm> (last visited Nov. 4, 2007); SmartWay Transport Partnership, <http://www.epa.gov/smartway> (last visited Nov. 4, 2007); and the Environmental Technology Verification Program, <http://www.epa.gov/etv> (last visited Nov. 4, 2007). Finally, preferential purchasing programs such as EnergyStar, <http://www.energystar.gov> (last visited Nov. 4, 2007) and WaterSense, <http://www.epa.gov/watersense> (last visited Nov. 4, 2007), are available.

⁷⁹ Lee Scott, Chief Executive Officer and President of Wal-Mart Stores, Inc., Lecture to the Prince of Wales's Business & the Environment Programme on Sustainability 360: Doing Good, Better, Together, Feb. 1, 2007, <http://www.walmartfacts.com/articles/4785.aspx> (last visited Nov. 7, 2007). See also Wal-Mart, Wal-Mart CEO Lee Scott Unveils "Sustainability 360," <http://www.walmartstores.com/GlobalWMStoresWeb/navigate.do?catg=691> (last visited Nov. 7, 2007).

⁸⁰ Deanna J. Richards & Robert A. Frosch, *The Industrial Green Game: Overview and Perspectives*, in NATIONAL ACADEMY OF ENGINEERING, THE INDUSTRIAL GREEN GAME: IMPLICATIONS FOR ENVIRONMENTAL DESIGN AND MANAGEMENT 1 (Deanna J. Richards ed., National Academy Press, 1997).

⁸¹ See, e.g., EPA, SUSTAINABILITY RESEARCH STRATEGY, http://www.epa.gov/sustainability/pdfs/EPA-12057_SRS_R4-1.pdf (last visited Nov. 4, 2007).

⁸² EPA, DRAFT REPORT ON THE ENVIRONMENT 2003 at D-6, http://www.epa.gov/indicate/roe/pdf/EPA_Draft_ROE.pdf (last visited Nov. 4, 2007). For a list of all 2007 indicators, see U.S. Environmental Protection Agency, EPA's Report on the Environment, A-Z Indicators List, <http://cfpub.epa.gov/eroe/index.cfm?fuseaction=list.listByAlpha> (last visited Nov. 4, 2007).

⁸³ EPA, 2008 ANNUAL PERFORMANCE PLAN AND CONGRESSIONAL JUSTIFICATION at G/O-32, <http://www.epa.gov/ocfo/budget/2008/overview.pdf> (last visited Nov. 4, 2007).

²³ Press Release, U.S. EPA, State-of-the-Art Approach Helps EPA Identify Chemical Risks (Apr. 11, 2007), available at <http://www.epa.gov/ord/newsreleases/newsrelease-041107.html> (last visited Nov. 3, 2007).

²⁴ RICHARD LAZARUS, *THE MAKING OF ENVIRONMENTAL LAW* (Univ. of Chicago Press 2004).

²⁵ The Dow Chemical Company is an example of a company that has adopted sustainable goals, as it aims to “innovate to improve confidence that our products are managed safely throughout their lifecycle and develop products that will make a lasting, positive improvement on the world.” Dow Chemical Company, Our Commitments, 2015 Sustainability Goals, (last visited Nov. 3, 2007).

²⁶ EPA, *BEYOND RCRA: WASTE AND MATERIALS MANAGEMENT IN THE YEAR 2020* at 19 (Apr. 2003), available at <http://www.epa.gov/epaoswer/osw/vision.pdf> (last visited Nov. 3, 2007).

²⁷ EPA INNOVATION ACTION COUNCIL, *EVERYDAY CHOICES: OPPORTUNITIES FOR ENVIRONMENTAL STEWARDSHIP* at 1 (Nov. 2005), available at <http://epa.gov/innovation/pdf/rpt2admin.pdf> (last visited Nov. 3, 2007).

²⁸ Exec. Order No. 13,423, 72 Fed. Reg. 3,919 (Jan. 26, 2007), available at <http://a257.g.akamaitech.net/7/257/2422/01jan20071800/edocket.access.gpo.gov/2007/pdf/07-374.pdf> (last visited Nov. 4, 2007) [hereinafter Executive Order 13243].

²⁹ Exec. Order 13243, *id.* at 3,923.

³⁰ Environmental Council of the States, About ECOS, <http://www.ecos.org> (last visited Nov. 4, 2007).

³¹ See Environmental Council of the States, Innovation and Sustainability in the States, <http://www.ecos.org/content/innovations> (last visited Nov. 4, 2007).

³² *Massachusetts v. EPA*, 549 U.S. 1438 (2007).

³³ Paul E. Hagen, Principal, Beveridge & Diamond, P.C., Introductory Remarks and Course Overview at the ALI-ABA International Environmental Law Conference (Apr. 12, 2007).

³⁴ U.S. Council of Mayors, Resolution Endorsing the U.S. Mayors Climate Protection Agreement, http://www.usmayors.org/uscm/resolutions/73rd_conference/env_04.asp (last visited Nov. 4, 2007).

³⁵ See Environment News Service, *U.S. Mayors Take the Lead in Fighting Climate Change* (June 25, 2007), available at <http://www.ens-newswire.com/ens/jun2007/2007-06-25-04.asp> (last visited Nov. 7, 2007); Anne Underwood, *Mayors Take the Lead*, NEWSWEEK, Apr. 16, 2007, at 68.

³⁶ See generally Sarbanes-Oxley Act of 2002, 15 U.S.C.S. §§ 7201, *et seq.* (2002).

³⁷ FASB, FINANCIAL ACCOUNTING SERIES: FASB INTERPRETATION NO. 47 (No. 266-B) (Mar. 2005), available at <http://72.3.243.42/pdf/fin%2047.pdf> (last visited Nov. 7, 2007).

³⁸ FASB, STATEMENT OF FINANCIAL ACCOUNTING STANDARDS NO. 143: ACCOUNTING FOR ASSET RETIREMENT OBLIGATIONS (June 2005), available at <http://www.fasb.org/pdf/fas143.pdf> (last visited Nov. 7, 2007).

³⁹ GRI, What We Do, <http://www.globalreporting.org/AboutGRI/WhatWeDo> (last visited Nov. 4, 2007).

⁴⁰ GRI, Our History, <http://www.globalreporting.org/AboutGRI/WhatWeDo/OurHistory> (last visited Nov. 4, 2007); Coalition for Environmentally Responsible Economies, About CERES, <http://www.ceres.org/ceres/> (last visited Nov. 4, 2007).

⁴¹ GRI, *supra* note 40.

⁴² See *e.g.*, EPA, FINANCIAL INCENTIVES FOR ENVIRONMENTAL MANAGEMENT SYSTEMS 14 (Dec. 2006), available at <http://www.epa.gov/ems/docs/resources/FinalFinancialIncentivesforEMS%203-07.pdf> (last visited Nov. 4, 2007) [hereinafter FINANCIAL INCENTIVES].

⁴³ FINANCIAL INCENTIVES, *id.*

⁴⁴ FINANCIAL INCENTIVES, *id.*

⁴⁵ EU, Waste Electrical and Electronic Equipment, http://ec.europa.eu/environment/waste/weee/index_en.htm (last visited Nov. 4, 2007) [hereinafter WEEE].

⁴⁶ WEEE, *id.*

⁴⁷ European Commission, REACH, http://ec.europa.eu/environment/chemicals/reach/reach_intro.htm (last visited Nov. 7, 2004) [hereinafter REACH]. RoHS and WEEE “are designed to tackle the rapidly increasing waste stream of electrical and electronic equipment” and complement EU action on landfill and incineration of waste. WEEE, *supra* note 45. The REACH regulation gives industries greater responsibility to manage risks from chemicals and to provide

related safety information. REACH, *supra*. “Manufacturers and importers will be required to gather information on the properties of their substances,” which will help them manage them safely, “and to register the information in a central database.” REACH, *supra*.

⁴⁸ See EQUATOR PRINCIPLES, THE “EQUATOR PRINCIPLES” 2 (July 2006), available at http://www.equator-principles.com/documents/Equator_Principles.pdf (last visited Nov. 7, 2007).

⁴⁹ See, *e.g.*, Citigroup.com, Forestry, <http://www.citigroup.com/citigroup/environment/data/forestry.htm> (last visited Nov. 4, 2007); Citigroup.com, Citi ESRM Approach to Commercial Logging and Primary Processing of Timber, <http://www.citigroup.com/citigroup/environment/data/forestry.pdf> (last visited Nov. 4, 2007); Citigroup, Environmental and Social Risk Management Policy, <http://www.citigroup.com/citigroup/environment/data/esrmpolicy.htm> (last visited Nov. 4, 2007).

⁵⁰ See FINANCIAL INCENTIVES, *supra* note 42, at 13.

⁵¹ Engardio, *supra* note 6 (stating that assets of mutual funds designed to invest in companies meeting social responsibility criteria have increased by \$166 billion between 1995 to 2005 and that institutions, such as charitable trusts and government pension funds, with \$4 trillion in assets “pledge to weight sustainability factors in investment decisions”).

⁵² JANE AMBACHTSHEER ET AL., FIDUCIARY GUIDE TO TOXIC CHEMICAL RISK (Investor Environmental Health Network/Rose Foundation for Communities and the Environment 2007), available at <http://www.iehn.org/filesalt/Fiduciary.pdf> (last visited Nov. 7, 2007) [hereinafter FIDUCIARY GUIDE]; see Investor Environmental Health Network, News, <http://www.iehn.org/?q=node/41> (last visited Nov. 4, 2007).

⁵³ FIDUCIARY GUIDE, *id.* at 3.

⁵⁴ FIDUCIARY GUIDE, *id.* at 6.

⁵⁵ FIDUCIARY GUIDE, *id.*

⁵⁶ FIDUCIARY GUIDE, *supra* note 52, at 3.

⁵⁷ UN ENV’T PROGRAMME FINANCE INITIATIVE, A LEGAL FRAMEWORK FOR THE INTEGRATION OF ENVIRONMENTAL, SOCIAL AND GOVERNANCE ISSUES INTO INSTITUTIONAL INVESTMENT (Oct. 2005), available at http://www.unepfi.org/fileadmin/documents/freshfields_legal_resp_20051123.pdf (last visited Nov. 7, 2007).

⁵⁸ S. Jacob Scherr & R. Juge Gregg, *Johannesburg and Beyond: The 2002 World Summit on Sustainable Development and the Rise of Partnerships*, 18 GEO. INT’L ENVTL. L. REV. 425, 429-430 (2006).

⁵⁹ *E.g.*, Press Release, UN, World Leaders Adopt ‘United Nations Millennium Declaration’ at Conclusion of Extraordinary Three-Day Summit (Sept. 8, 2000), <http://www.un.org/News/Press/docs/2000/20000908.ga9758.doc.html> (last visited Nov. 7, 2007).

⁶⁰ UN, Millennium Development Goals, <http://www.un.org/millenniumgoals/index.html> (select button at left for goal “7: Ensure environmental sustainability”) (last visited Nov. 7, 2007).

⁶¹ See generally UN, Monterrey Consensus on Financing for Development (2002), <http://www.un.org/esa/ffd/Monterrey/MonterreyConsensus.pdf> (last visited Nov. 4, 2007); UN Financing for Development Office, Overview, <http://www.un.org/esa/ffd/indexOverview.htm> (last visited Nov. 4, 2007).

⁶² Scherr & Gregg, *supra* note 58, at 425-27.

⁶³ See Scherr & Gregg, *supra* note 58, at 428; Press Release, UN, Sustainable Development Summit Concludes in Johannesburg: UN Secretary-General Kofi Annan Says It’s Just the Beginning (Sept. 4, 2002), <http://www.un.org/events/wssd/pressreleases/finalrelease.pdf> (last visited Nov. 7, 2007).

⁶⁴ See, *e.g.*, Scherr & Gregg, *supra* note 58, at 425-26, 428, 436, 439-40.

⁶⁵ UN Department of Economic and Social Affairs, Division for Sustainable Development, Partnerships for Sustainable Development—CSD Partnerships Database, http://webapps01.un.org/dsd/partnerships/public/partnerships/title_all_1.html (last visited Nov. 7, 2007) [hereinafter Partnerships Database].

⁶⁶ Partnerships Database, *id.*

⁶⁷ See, *e.g.*, Partnerships Database, *id.*; Homepage, Refrigerants Naturally! website, <http://www.refrigerantsnaturally.com> (last visited Nov. 7, 2007).

⁶⁸ See Interactive Maps, Global Forest Watch website, <http://www.globalforestwatch.org/english/index.htm> (last visited Nov. 4, 2007).

⁶⁹ See About Us, Forest Stewardship Council website, <http://www.fsc.org/en/about> (last visited Nov. 4, 2007).

⁷⁰ See, *e.g.*, IKEA Group, Ikea Actively Works Against Illegal Logging,

http://www.ikea.com/ms/en_US/about_ikea/social_environmental/Forestry.pdf (last visited Nov. 4, 2007).

⁷¹ Engardio, *supra* note 6.

⁷² See generally DANIEL C. ESTY & ANDREW S. WINSTON, *GREEN TO GOLD: HOW SMART COMPANIES USE ENVIRONMENTAL STRATEGY TO INNOVATE, CREATE VALUE, AND BUILD COMPETITIVE ADVANTAGE* (Yale University Press 2006).

⁷³ ESTY & WINSTON, *id.* at 72.

⁷⁴ Many EPA program offices and regions are independently addressing these questions. For example, the Pollution Prevention program is examining how best to maximize its efforts to contribute to sustainability. Water programs are talking about sustainable water use and connecting the dots with potential impacts from climate change. Air programs have historically shown that conservation and efficiency are undervalued in national energy strategies. Recognizing the need for management efficiency and the air-water-land interface, regulatory programs are moving beyond single-media permitting to explore integrated permitting (a practice being advanced in the UK). Assessing, integrating, and maximizing these diverse activities around sustainability greatly enhance all of them.

⁷⁵ See J. Gray et al., *Integrated Regulation—Experiences of IPPC in England and Wales*, 21 WATER & ENV'T J. 69 (2007), available at <http://www.blackwell-synergy.com/doi/full/10.1111/j.1747-6593.2006.00048.x> (last visited Nov. 4, 2007).

⁷⁶ See, e.g., U.S. GOVERNMENT ACCOUNTABILITY OFFICE, *GLOBALIZATION: NUMEROUS FEDERAL ACTIVITIES COMPLEMENT U.S. BUSINESS'S GLOBAL CORPORATE RESPONSIBILITY EFFORTS 23-25* (Aug. 2005), available at <http://www.gao.gov/new.items/d05744.pdf> (last visited Nov. 4, 2007).

⁷⁷ See Eric Lipton & Gardiner Harris, *In Turnaround, Industries Seek U.S. Regulations*, N.Y. TIMES, Sept. 16, 2007, at 1, available at <http://www.nytimes.com/2007/09/16/washington/16regulate.html> (last visited Nov. 4, 2007).

⁷⁸ These include supply chain and manufacturing programs, such as: Green Suppliers Network, <http://www.greensuppliers.gov/gsn/page.gsn?id=about> (last visited Nov. 4, 2007); Lean Manufacturing and Environment, <http://www.epa.gov/innovation/lean/index.htm> (last visited Nov. 4, 2007); Design for the Environment, <http://www.epa.gov/dfe/pubs/projects/index.htm> (last visited Nov. 4, 2007); Clean Processes, <http://www.epa.gov/ORD/NRMRL/std/cppb/index.html> (last visited Nov. 4, 2007); Green Chemistry Program, <http://www.epa.gov/greenchemistry/> (last visited Nov. 4, 2007); Nanoscale Materials

Stewardship Program, <http://www.epa.gov/oppt/nano/#stewardship> (last visited Nov. 4, 2007); Nanotechnology, <http://es.epa.gov/ncer/nano/> (last visited Nov. 4, 2007); and the National Partnership for Environmental Priorities Program, <http://www.epa.gov/epaoswer/hazwaste/minimize/npep/index.htm> (last visited Nov. 4, 2007); and management and performance programs, such as: the Sector Strategies Program, <http://www.epa.gov/sectors/> (last visited Nov. 4, 2007); National Environmental Performance Track, <http://www.epa.gov/performance-track> (last visited Nov. 4, 2007); the Sustainable Futures Initiative, <http://www.epa.gov/oppt/newchems/pubs/sustainablefutures.htm> (last visited Nov. 4, 2007); SmartWay Transport Partnership, <http://www.epa.gov/smartway> (last visited Nov. 4, 2007); and the Environmental Technology Verification Program, <http://www.epa.gov/etv> (last visited Nov. 4, 2007). Finally, preferential purchasing programs such as EnergyStar, <http://www.energystar.gov> (last visited Nov. 4, 2007) and WaterSense, <http://www.epa.gov/watersense> (last visited Nov. 4, 2007), are available.

⁷⁹ Lee Scott, Chief Executive Officer and President of Wal-Mart Stores, Inc., Lecture to the Prince of Wales's Business & the Environment Programme on Sustainability 360: Doing Good, Better, Together, Feb. 1, 2007, <http://www.walmartfacts.com/articles/4785.aspx> (last visited Nov. 7, 2007). See also Wal-Mart, Wal-Mart CEO Lee Scott Unveils "Sustainability 360," <http://www.walmartstores.com/GlobalWMStoresWeb/navigate.do?catg=691> (last visited Nov. 7, 2007).

⁸⁰ Deanna J. Richards & Robert A. Frosch, *The Industrial Green Game: Overview and Perspectives*, in NATIONAL ACADEMY OF ENGINEERING, *THE INDUSTRIAL GREEN GAME: IMPLICATIONS FOR ENVIRONMENTAL DESIGN AND MANAGEMENT 1* (Deanna J. Richards ed., National Academy Press, 1997).

⁸¹ See, e.g., EPA, *SUSTAINABILITY RESEARCH STRATEGY*, http://www.epa.gov/sustainability/pdfs/EPA-12057_SRS_R4-1.pdf (last visited Nov. 4, 2007).

⁸² EPA, *DRAFT REPORT ON THE ENVIRONMENT 2003 at D-6*, http://www.epa.gov/indicate/roe/pdf/EPA_Draft_ROE.pdf (last visited Nov. 4, 2007). For a list of all 2007 indicators, see U.S. Environmental Protection Agency, EPA's Report on the Environment, A-Z Indicators List, <http://cfpub.epa.gov/eroe/index.cfm?fuseaction=list.listByAlpha> (last visited Nov. 4, 2007).

⁸³ EPA, *2008 ANNUAL PERFORMANCE PLAN AND CONGRESSIONAL JUSTIFICATION at G/O-32*, <http://www.epa.gov/ocfo/budget/2008/overview.pdf> (last visited Nov. 4, 2007).

ENDNOTES: DOING MORE WITH LESS *continued from page 26*

³ Brown, *supra* note 1, at 63.

⁴ INTERLABORATORY WORKING GROUP ON ENERGY-EFFICIENT AND CLEAN-ENERGY TECHNOLOGIES, OFFICE OF ENERGY EFFICIENCY AND RENEWABLE ENERGY, U.S. DEPARTMENT OF ENERGY (2000), *Scenarios for a Clean Energy Future*, at 7.18, available at <http://www.ornl.gov/sci/eere/cef/> (last visited Oct. 10, 2007).

⁵ INTERLABORATORY WORKING GROUP *id.* at 7.19.

⁶ Bill Prindle & Maggie Eldridge, American Council for an Energy Efficient Economy, *The Twin Pillars of Sustainable Energy* (May 2007), 10, available at <http://www.aceee.org/store/proddetail.cfm?CFID=140174&CFTOKEN=18932450&ItemID=432&CategoryID=7> (last visited Nov. 17, 2007).

⁷ Luisa M. Freeman, *A BUSINESS CASE: ENERGY EFFICIENCY IN THE NEW ENVIRONMENT, PUBLIC UTILITIES FORTNIGHTLY*, Dec. 2006, at 46, 48.

⁸ American Council for an Energy Efficient Economy, *The House-Passed Combined Renewable Energy and Energy Efficiency Standard*, available at http://aceee.org/energy/national/1pager_House_RES-EERS.pdf (last visited Nov. 17, 2007).

⁹ Benjamin K. Sovacool & Jack N. Barkenbus, *Necessary but Insufficient: State Renewable Energy Portfolio Standards and Climate Change Policies*, ENVIRONMENT, July 1, 2007, at 20.

¹⁰ Steven Nadel, American Council for an Energy Efficient Economy, *Energy Efficiency Resource Standards*, (Mar. 2006), iii, available at <http://www.aceee.org/store/proddetail.cfm?CFID=140174&CFTOKEN=18932450&ItemID=409&CategoryID=7> (last visited Nov. 17, 2007).

¹¹ Treehugger, *An Alternative to Green Tags – Sterling Planet's "White Tags,"* (May 11, 2006), http://www.treehugger.com/files/2006/05/an_alternative.php (last visited Nov. 17, 2007).

¹² Sovacool, *supra* note 9.

¹³ Sovacool, *supra* note 9.

¹⁴ Thomas R. Kuhn, *Energizing Efficiency's Potential*, THE ELECTRICITY JOURNAL, Oct. 2006, at 83, 86.

¹⁵ UNITED NATIONS ENVIRONMENT PROGRAMME, *BUILDINGS AND CLIMATE CHANGE 43* (2007) available at http://www.unep.fr/pc/sbc/documents/Buildings_and_climate_change.pdf (last visited Oct. 14, 2007).

¹⁶ UNITED NATIONS ENVIRONMENT PROGRAMME, *id.* at 56.

¹⁷ Sandra Levine & Katie Kendall, *Energy Efficiency and Conservation: Opportunities, Obstacles, and Experiences*, 8 VT. J. ENVTL. L. 101, 112-13 (2006).

¹⁸ Levine, *id.* at 107.

¹⁹ Freeman, *supra* note 7, at 46.