
Proving the Value of Environmental Management Systems

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In the United States, corporate watchdogs have traditionally graded companies' environmental performance on past records of emissions and compliance with regulations. However inexact, these data have long served as critical benchmarks for separating good players from bad. More recently, regulators, non-governmental organizations, and investors have started looking at management processes within companies on the premise that disclosure of internal decision-making functions can offer insight into the cause-effect relationship between corporate process and environmental impacts. Thus, companies find themselves measured not only on waste outputs and environmentally related fines, but also on their environmental management systems.

An environmental management system (EMS) is a corporate instrument that provides a company's environmental and safety programs with a formal structure.¹ The EMS is an organizing tool that companies can use to manage environmental impacts on multiple fronts. Multinational corporations, whether headquartered in the United States or in other countries, find the EMS a useful tool for responding to rising demands for social and environmental accountability worldwide. Where governments have often stalled on critical issues such as climate change, many businesses have used their management systems to plan and act on sustainability initiatives. Indeed, to remain competitive in countries or markets

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where an EMS is necessary for access, such as in Europe and Asia, many corporations do not consider the option of being without such management systems.

One important stakeholder filling the demand for environmental accountability is the socially responsible investing (SRI) community. SRI represents shareholders who judge corporate ethical practices with their investment dollars. Where environmental accountability matters to SRI and where attracting investment motivates corporations, the EMS provides a valuable means toward both

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ends. The regulatory incentives for developing EMSs have been apparent to business for more than a decade. It now behooves the SRI community to enter the arena and create additional incentives for improving EMS quality. As an active audience for EMS information, SRI constitutes a stakeholder that can provide both constructive feedback and investment rewards.

An overview of a database created by one SRI research firm is presented here to demonstrate how stakeholders can follow

EMS development in large, publicly held companies. As a monitoring device, the database can be used to educate stakeholders on the variety of EMS elements in diverse companies. It can also be used to benchmark individual corporate efforts against industry peers. In time, the database should provide insight into how important an EMS is to environmental performance, and which elements are indispensable.

HOW THE EMS WORKS

Companies have wide discretion over EMS development and use. The EMS may cover only a small portion of a company's activities or it may apply throughout. Some companies prefer to leave environmental management to an outside consultant or vendor. Others will take a thoroughly hands-on approach. In its fullest application, an EMS integrates a framework for decision-making into the routine of a company's operation so that environmental issues become a mainstream management consideration. In employing this approach, for example, a company makes the task an in-house collaboration involving multiple departments and external players. In a simplistic scenario, the operations department talks to purchasing, purchasing works with suppliers, marketing surveys consumers and relays product information ideas back to operations. Participants can include executives from the highest levels of management down to hourly employees on the shop floor. There is a roundtable spirit to the EMS structure

that promotes interdisciplinary brainstorming.² The thinking behind this approach is that processes do not work in isolation but alternately impact and benefit from seemingly unrelated processes elsewhere in the company. Furthermore, the framework does not apply to just one task, but becomes institutionalized to cover any number of ongoing environmental and safety issues, such as pollution prevention, improved safety, and product take-back.

As a model for business operations in general, an EMS is widely applicable simply because of its common sense elements. These include an underpinning of sound policy and planning, proof of implementation, review, and continuous improvement. ISO 14001 is an international EMS standard that provides a clear articulation of these elements.³ The International Organization for Standardization (ISO), which first published ISO 14001 in 1996, set five basic building blocks for an EMS. The ISO 14000 series offers nearly two dozen sets of guidance documents for environmental management. The 14001 EMS standard is the only one of the series to include certification requirements. While ISO 14001 is voluntary, certification to the standard is increasingly viewed as a benchmark of environmental integrity, and in some cases has become a requirement for access to markets.⁴ Both General Motors and Ford, for instance, require their numerous suppliers to achieve ISO 14001 certification. According to ISO 14001, an EMS must contain or do the following:⁵

1. It must include an environmental *policy* that grounds the company's environmental goals and objectives.
2. It must include *planning* the means by which the EMS operates. Often this means forging communications between groups and/or divisions within a company that previously may not have communicated—the objective being that cross-fertilization and a holistic approach breed integrated, better solutions.
3. It must include *implementation*. The EMS must function. It cannot simply be a paper exercise.
4. It must be *audited* by a third party (an outside registrar) who certifies that the policy, planning, and implementation criteria have been met. A worthy ISO 14001 EMS must document what the EMS is monitoring; while this documentation can be used to determine a company's environmental performance, auditors are only interested in whether data are being collected, not what those data say.⁶
5. It must have *management review*. Implementation and auditing must be followed by review and modifications that improve operations' influence on environmental stewardship. These steps are not simply one-time tasks, but a repeating cycle. The standard puts great emphasis on continuous improvement.

THE GROWING AUDIENCE FOR CORPORATE INFORMATION

The advent of the EMS in business has coincided with a burgeoning interest in corporate transparency. In the U.S., official demand for information came with government regulatory programs enacted during the 1970s and expanded in the 1980s. The EMS originated out of the private sector's need to better organize

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its response to increasing government oversight. Industries began to develop management codes of conduct during the late 1980s.⁷ Responsible Care, the code developed by the Chemical Manufacturers' Association (now the American Chemistry Council) in 1988, represents one of the better known of these industry initiatives.

At the same time, public interest advocates and citizens groups increased outside pressure on corporations for information on toxic waste sites and emissions.

Celebrated cases involving neighborhoods such as Love Canal, New York; Woburn, Massachusetts; and Hinkley, California popularized the notion of public protest and litigation as methods to force corporate environmental records into the open. Citizens, frustrated with government inaction in many of these cases, adopted an ethic of agitation and self-reliance to get results.

The SRI community also had a part to play. Its history as a force seeking response from corporations on numerous ethical issues pushed the cause for greater disclosure. Although practiced by individuals and groups such as Quakers for centuries, the modern SRI movement developed into its current form during the 1980s with the campaign for divestment from South Africa. Signal environmental events of the 1980s, such as the Union Carbide chemical disaster in Bhopal, India and the Exxon Valdez oil spill in Alaska, further fueled the SRI cause. SRI campaigns on behalf of environmental concerns, human rights, labor, and community relations all benefited from the bull market of the 1990s.⁸ The steady increase in the number of ethically minded investors (and their mounting assets) added financial imperatives to the push for greater disclosure. The majority of social investors continue to act on normative inclinations, but an ascendant school of thought among these investors involves a more practical track. It holds that environmental performance impacts financial performance, and therefore heavy environmental liabilities portend reduced financial returns.⁹ To satisfy their concerns, investors want to know more about a company's internal management and operations.

Confronted with growing pressure for information and prompted by a desire to maintain control of information flow, companies responded with a surge of environmental reporting during the 1990s. Nevertheless, the variability of the reports led to calls for standardization from stakeholders who became frustrated with their inability to compare the performances of different companies. In 1997, the Global Reporting Initiative was created to bring some consistency and rigor to corporate reporting.¹⁰ Among the initiative's more interested stakeholders, the SRI community represents a potentially powerful force, as assets under SRI-guided funds accumulate in the United States, Europe, and Asia. According to a 1999 report by the Social Investment Forum, United States investments using social investment strategy grew from \$40 billion in 1984 to over two trillion dollars by 1999.¹¹ According to the SIF report, social investments currently account for about 13 percent of the estimated \$16.3 trillion under professional management in the United States. In Japan, assets in environmentally focused funds alone jumped from approximately \$500 million (67 billion Yen) to over one billion dollars (220 billion and 138 billion Yen) in 2000 and 2001.¹² In late 2001, the Tokyo-based Nikko Asset Management Company reported a parallel rise in SRI funds, corporate reporting, and EMS development in Japan between 1996 and 2000.

In both Europe and the U.S., governments have acknowledged SRI's influence. During July 2000, the UK government required all pension fund trustees to disclose whether they considered social, environmental, or ethical ramifications of their investment decisions.¹³ In the United States, after several years of pressure from environmental NGOs and SRI representatives, the Securities and Exchange Commission pledged in October 2001 to review more closely company financial statements on environmental liabilities.¹⁴

Worldwide pressure for greater corporate disclosure confronts the business world daily. These pressures underscore the imperatives for management systems that facilitate and govern the flow of information outside the corporate entity. The incentives, however, are not all negative in nature. In contrast to public interest pressure groups and government regulators, the SRI community has an opportunity to provide positive rewards. These include increased shareholder investment and reputational benefits. Greater disclosure and improved environmental management, while not precluding the risks of public scrutiny, can gain a company more investors and a better name.

EMS: PROMOTING TRANSPARENCY

Any organization implementing a proper EMS establishes the mechanisms for transparency. Because the EMS model emphasizes internal communications and documentation, companies essentially set up systems for reporting to themselves. Management systems employ monitoring and discovery to inform process

improvements. The logical inference from a public interest standpoint, then, is that they create the means for reporting internal information out to the public. In the United States and in most other countries, EMSs are voluntary efforts, not mandated by government regulation. Under such a voluntary aegis, companies can be reluctant to disclose their inner workings. This is especially true in the U.S. and Asia where the ethic of trade secret privileges and corporate privacy is strong. U.S. industry representatives have held tightly to the position that the ISO 14000 series not require disclosure of environmental performance, and this has been a source of tension with non-industry stakeholders.¹⁵ As of 2002, the ISO 14000 series has not required public disclosure of EMS review results or performance.

To ISO 14000 critics, the EMS concept and the ISO 14001 standard were primarily about process performance, not environmental performance.¹⁶ While industry may have sought to keep environmental performance disclosure out of ISO 14001 at its inception, observers note that industry managers adopt the EMS standard (and the EMS concept) for the purposes of improving environmental performance and exceeding regulatory compliance.¹⁷ Industry EMS proponents have maintained that the process dictates the performance. (The Eco-Management and Audit Scheme (EMAS), a standard used in Europe, does require companies to report on an EMS's performance). SRI stakeholders, for one, will continue to push for information on management systems and environmental performance. Corporate transparency is an important part of SRI's long-term mission and the EMS is its made-to-order vehicle.

Another important rationale for EMSs and disclosure is growing concern for financial risks posed by significant corporate liabilities. The World Resources

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Institute's (WRI) 2000 report *Pure Profit* explored a general failing of financial markets to "incorporate the risks to corporations from environmental exposures."¹⁸ WRI studied forestry and paper companies that did not report the full extent of their waste management, regulatory, and litigation liabilities in their annual financial reports. The cautionary tale of WRI's study argued that these liabilities, if not disclosed and managed, pose risks to financial markets. The study is among dozens that have

been conducted to link environmental performance to financial results.¹⁹

While the connection is not definitively proven, the question's steady drum-beat has caught the attention of financial markets. In 2001, those markets reacted dramatically to asbestos litigation and lead paint suits. As much as some might want to blame tort law and litigiousness for these scenarios, the link with markets

is undeniable and likely to grow stronger. In the wake of the Enron scandal, more investors want greater detail on company liabilities and internal management. It will not simply be social investors, NGOs, and plant neighbors looking for information, but Wall Street and the international investment community at large.

EMS: FORWARD-LOOKING INDICATORS

Traditional indicators of past corporate environmental performance—hazardous waste liabilities, toxic chemical emissions, and enforcement tallies—all remain important. They show a company's history. The EMS is a set of process-oriented indicators that point to the future.

The latter can demonstrate if a company is serious about commitment to its environmental and safety programs by highlighting where the company assigns responsibility and how many resources are committed. Several questions are key to making this assessment. First, does the top environmental official in the company have access to the CEO and board, or are environmental considerations orphaned to a non-essential backwater? Second, do written policies say

anything beyond very general pledges to improvement and compliance? Some companies are better at articulating fairly precise goals and objectives that project a tangible sense of mission. Third, what is the nature of environmental and health training for employees and the communications to reinforce training lessons? Are they continuous and inclusive or perfunctory excuses for the real thing—a manual passed out with no follow-up? Fourth, are there incentive systems for rewarding new ideas and achievements, and do all employees have an opportunity to play a role versus select persons or one department? Finally, a company's partnerships with non-governmental groups and participation in voluntary government programs signal a willingness to attempt alternative means of achieving compliance or going beyond it. Evidence of public disclosure through annual or periodic reports is another strength. Detail and honesty distinguish those reports that are helpful from those that are mere public relations exercises.

An EMS as a policy and process indicator has an important role in defining corporate response to slow-moving, abstract environmental issues. Issues such as biodiversity, land use, chemical management, and urban sprawl create debates that will not be settled quickly. Their solutions involve long-term planning and policy leadership. Climate change, for instance, presents a difficult challenge for judging companies using traditional "lagging" indicators. Companies are not

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required to report greenhouse gas emissions (although more are doing so voluntarily), and it can be difficult to establish how much of an impact any one company has on global warming. Where piecemeal data undercuts SRI analysts' ability to make meaningful comparisons, the opportunity for incorporating company policy and process information comes into play.

DuPont is one company that allows for such analysis. The company has set clear and ambitious goals for reducing its greenhouse gases, and has been among the first to enter CO₂ emissions trading markets.²⁰ A judgment can be made that DuPont could be considered a leader in addressing the issue of climate change—not because of the raw volume of emissions curtailed, but because of an aggressive policy stand that sets it apart from many other companies. This is the best analysis that can be achieved with the current understanding of the climate change issue and any one company's impact. DuPont is demonstrating a commitment to the precautionary principle in this one area. The majority of energy intensive industries cannot claim the same. In time, as it follows through on its policy declarations, DuPont's accounting of emissions reductions will become more important.

As of 2001, DuPont reported reducing its greenhouse emissions by 50 percent from 1990 levels, surpassing a 45 percent goal. Encouraged by this achievement, the company set a 65 percent goal for 2010. Such achievements are made possible only through highly organized efforts at developing and maintaining management systems. DuPont has 21 plants certified to ISO 14001 and others certified to EMAS. The company collects data from its facilities worldwide to present aggregated corporate-level accountings of its waste and emissions reduction efforts. DuPont environmental managers have support from the highest level of the company, including the CEO. The top environmental officer reports to the CEO. The company rewards managers for achieving environmental objectives, and job reviews are based in part on achievement of environmental objectives. When asked for a description of DuPont EMS attributes, the company listed the following:

1. Strong upper management commitment and vision of sustainable growth
 2. Corporate policies, standards, and guidelines
 3. First and second party audits with third party oversight
 4. Safety, health, and environmental networks and leadership teams
 5. Public reporting of environmental performance
 6. Safety, health, and environmental training for all employees
 7. Sustainable Growth Excellence Awards
 8. Safety, health, and environmental information systems—corporate environmental plan, audits information database, chemical information system, etc.
 9. Benchmarking with others in chemical industry and other industry sectors
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DuPont sees fit to invest significant resources in its efforts at environmental stewardship. This is not to say the company does not remain controversial for its past environmental record and certain ongoing product lines. International controversies over DuPont chemical technologies such as ozone-layer-destroying chlorofluorocarbons (CFCs), leaded fuel additives, and the pesticide Benlate are only a few of the negative stories that have painted DuPont as a black knight for environmentalists. In the United States, substantial volumes of toxic emissions and Superfund sites add to this reputation. Indeed, a long experience with environmental controversy likely influenced DuPont's decision to embrace an EMS approach with accompanying public disclosure.

The proof of DuPont's EMS is only partial to date. The company does a commendable job of amassing considerable data for its public reports. In addition to greenhouse gas reductions, the company's efforts at toxic emissions reductions also appear to continue. Use of underground injection wells for hazardous waste disposal, a particularly controversial practice, has decreased by nearly 100 percent. DuPont has more room for improvement. Going forward, the task for DuPont will be to demonstrate whether its EMS and stated ethic of environmental responsibility can turn around what many consider a substantial legacy of industrial pollution. DuPont's policies and systems raise expectations for improved environmental performance that stakeholders can use to leverage further improvements.

Another important rationale for EMSs and disclosure is growing concern for financial risks posed by significant corporate liabilities.

THE GAP BETWEEN THE IDEAL AND REALITY

Gauging the quality and extent of EMS use is difficult without an available database that acts as a depository of EMS information. The closest we have come may be the registration records for various European-generated standards such as ISO and EMAS. In the United States, business has been slow to adopt standardized models that require heavy documentation and third-party review. ISO 14001, recognized worldwide, is the most common standardized EMS model. But ISO 14001 is expensive, time consuming, and often without clear financial or regulatory rewards. The attitude from the stakeholder side has also been reserved. As an indicator of corporate environmental stewardship, the EMS has only recently received official recognition in the United States. And this recognition failed to achieve industry's wishes for reduced permitting and enforcement forbearance. Regulators and public interest advocates here in the United States have been slow to embrace the EMS as a stand-alone metric because of a suspicion of industry motives.²¹ They

assert that without disclosure of environmental performance, a sophisticated-looking EMS could be nothing more than a paper exercise and a public relations ploy. Indeed, there is evidence that EMSs have sometimes failed to prevent pollution or have not accompanied a notable rise in environmental performance.²²

However, in 2000, the United States Environmental Protection Agency (EPA) initiated the National Environmental Performance Track program for companies with exemplary management systems.²³ The program creates some special privileges for its members related to reduced reporting and monitoring and

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acknowledges the steps they have taken to address their environmental challenges. The rewards include the imprimatur of EPA and a listing on the agency website.

The EMS as indicator prompts skepticism because many stakeholders cling to traditional lagging indicators as the only legitimate metrics. But lagging indicators can be inexact and heavily qualified. How much do enforcement figures inform when state and federal regulators have resources enough to inspect only a small minority of facilities? Enforcement records do not correspond to an equal applica-

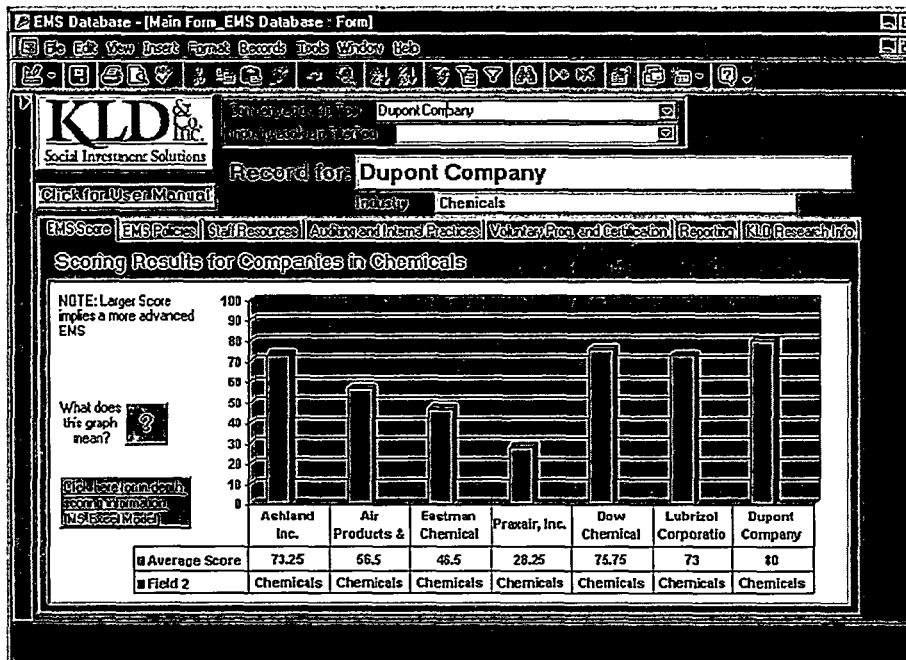
tion of regulatory oversight. Major companies are easy targets and more heavily scrutinized than smaller, non-consumer oriented firms. Are emissions statistics as reliable and telling as they seem? We assess pollutants one by one, without considering their synergistic effects. We know very little about any one facility or any one company's contribution to the total pollutant mix or its impact on human health. We make the best judgment we can using simplified metrics such as pounds per year of a list of chemicals we know or suspect of being toxic. These questions do not argue for ignoring these indicators. They do qualify their absolute value, however.

THE UTILITY OF EMS TO STAKEHOLDERS AND BUSINESS

The intent here is not to settle the arguments for or against the efficacy of the EMS. While case studies assessing EMS influence on performance will continue to provide snapshots of progress in time, SRI can perform a long-term service through its ongoing research processes. KLD Research & Analytics (KLD), an SRI research firm, has initiated a database to log information on company EMSs. The purpose of the database is to keep an accounting, year by year, of the effort that publicly held companies invest in their management systems. A scoring system within the database allows users to compare companies on a simple set of criteria. The scoring system is limited in satisfying the range of personal preferences on what

EMS aspects should be weighted more heavily. As such, the basic scoring model gives equal weight to reporting and voluntary program participation, even though individual users may differ on what is more important.

Normative data have been chosen to influence the score: EMS oversight by CEO or Board of Directors scores higher than oversight by a less senior official; a company with an environmental policy versus one without scores higher. Value neutral data such as the size of the company and number of environmental staff do not influence a company's score. Among other limitations, scores are not industry specific, although the database allows users to compare companies within individual industries. Database users can also select the data points to customize their own comparative criteria. Thus, if a user wants to find out which companies have ISO 14001 certification or which apply environmental policies to suppliers, they can find the discrete set. At its most basic, the database provides a starting point for analysis by applying a systematic framework.



EMS Database - [Main Form EMS Database : Form]

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Record for: **Intel Corporation**

Company Look Up Tool
Industry Look Up Filter Tool

Industry: **Electronics, Semiconductors**

EMS Score EMS Policies Staff Resources Auditing and Internal Practices Voluntary Prog. and Certification Reporting KLD Research Info

Auditing

Internal Audits Yes
Frequency of Internal Audits Every 3 years
Third Party Audits Yes
Frequency of 3rd Party Audits Every 3 years
Training and Education Yes

Management Review

EMS Performance used in Mngt. Review Yes
Management Rewards Yes
Comments on Mngt. Review: All employees are judged on their performance to Intel values. Intel's values include EHS under discipline. Every employee is assessed along the same lines. Performance is rewarded financially and with increasing responsibility.

Other Internal Practices

Internal Communication Yes

Additional Information: Auditing Program - Intel has established a rigorous environmental auditing program that consists of traditional self-assessments; cross-site assessments; and multi-dimensional audits conducted by an outside team of experts in conjunction with internal environmental staff.

The KLD database has a scoring system that weights environmental management aspects according to ambitiousness and verifiability in order to benchmark companies within and between industries.²⁴ Environmental policy statements and voluntary program participation provide the basis for the ambitiousness side of the score: it is an indicator of the level of effort the company invests in the EMSs sophistication. Auditing, training, and reporting data points form the verifiability axis; this is the indicator demonstrating a company's efforts at realizing and verifying the EMSs functionality.

Supplemental to this scoring model, and as a more rigorous underpinning of database credibility, KLD will note any correlation between EMS quality and patterns of environmental and social progress that KLD regularly monitors for SRI clients. Already KLD uses traditional performance indicators (emissions, liabilities, enforcement data) to assess corporate environmental stewardship. Community relations provide another measuring stick, since facility neighbors and host communities provide a barometer of company efforts at pollution management and emergency right-to-know practices. Thus, if companies with major investments in their EMSs generally improve environmental performance and community relations over several years' time, the correlation could suggest a positive influence. On the other hand, if companies with advanced EMSs do not improve, or continue to face regulatory problems and community controversy, the suggestion is that EMSs do not influence performance. We should also not rule out a mixed result, with some companies proving out their EMS investments while others fall down despite them.

What would be the utility of making the fuzzy conclusion that the EMS-performance link is a mixed bag of suggested connections? There is no guarantee

that this is not the case. Nevertheless, we should try for something more definitive. To get beyond suggestion and establish the link, we will need to reinforce the connections by attempting to disprove them. Because KLD regularly contacts companies for feedback on its corporate ratings, communications with companies on our EMS database findings will be critical. Particularly for positive correlation—that is, quality EMS associated with superior or improving environmental performance—we must ask why the correlation should stand. “Corporation A: How can we be sure that your EMS is responsible for your environmental performance? How can you prove it to us?”

Companies should be willing to back up this positive story with corroborating evidence. Those companies with negative correlations—weak EMSs matched with inferior or declining environmental performance—may be more difficult to assess. They are less obliging in providing information. Nevertheless, if they have a legitimate point of contention with the database-performance correlation, then their case may be instructive for the project at large. For example, they may rightfully assert that they had difficulty finding the correct EMS fit for their operations and proceeded through a trial and error stage. For the sake of credibility, enlisting third-party scrutiny of our database correlation process, either through academic review or corroboration with NGO and regulatory agency endorsement programs, will also be necessary.

Another method for ensuring the integrity of the project is to improve the resolution of the data points as we gain experience with the data collection process. Each year’s exercise will promote more incisive information gathering techniques and result in more precise EMS data points. As of 2002, these data points are general and designed to cut across a swath of industry sectors. They cover the following areas:

- **Policies:** information on the existence and nature of environmental policies, including any substantive aspects and whether the policies are referenced or integrated in company mission or value statements. Also, any comment on how widely applied the policies are—to domestic and international company operations and to suppliers.

- **Staff Resources:** names and titles of top environmental officers and their superiors (i.e., access of environmental officers to top management); EMS program staffing and budgeting; any descriptions of the chain of command or decision tree and staff dynamics.

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- **Auditing and Internal Practices:** information on internal and outside auditing; personnel-related practices such as training programs, communications, and EMS-related management incentives.

- **Voluntary Programs and Certifications:** certifications achieved; government program participation; non-governmental organizations partnerships.

- **Reporting:** information on published environmental, health, and safety reports, their contents and format; and participation in official reporting initiatives.

These indicators provide a superficial review of a company's EMS. Nevertheless, the database provides companies opportunities to fill in greater detail with commentary. Information on training and communications may entail several aspects: Intranet sharing of best practices or instructional courses to

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reinforce health and/or safety and environmental practices. As we improve our sense of EMS capabilities, we can hone our questionnaires to include such additional data points as pollution prevention program aspects or materials use and efficiency programs. With time, the database will become more industry-specific. Lending institutions, for instance, have different environmental aspects than chemical and mining companies. Yet another challenge involves defending the database's integrity against

charges that the information in it is only as good as the company's capacity and will to respond to questionnaires. Surveys are frequent and voluminous these days, and company personnel are busy. Our defense comes down to the same transparency arguments discussed above. If the company chooses to divulge very little or no information about its EMS, that is also telling. To be fair, the SRI data collector must ensure that the company has ample opportunity to respond and to understand that their results are compared to competitors. In fact, KLD views this competitive aspect as an incentive for sharing information. So far, information in the database has been hard earned as data collectors and companies get comfortable with the exercise.

CONCLUSION: BEYOND EMS

Although an EMS will not show us everything we need to know about a company's environmental impact, it is a tool that should be encouraged for its potential. Currently, EMSs are largely unproven in terms of indicating environ-

mental performance. They only show us what environmental initiatives a company has planned for its future and the systems in place to pursue its goals. As an indicator, they illuminate corporate attitude and effort on issues of environmental and social concern rather than performance.

An EMS is a work in progress and a worthwhile tool for companies to adopt, develop, and improve. In the short term, the EMS helps companies meet increased demands for accountability. In the longterm, observation and tracking of living EMS examples by stakeholders using the KLD database and other metrics can help elicit their long-term impact on environmental performance. Only such an exercise will prove out their value. My belief is that corporate EMSs will generate better performance. But stakeholders such as the SRI community have a part to play in making this a reality, holding companies to their policies and strategies and informing them when performance does not measure up to the promise.

As EMSs gather momentum and companies customize better models to suit the needs of individual industries and facilities, the idea that such management frameworks can work in non-environmental efforts should catch on. Logical applications could include supplier relationships in the apparel industry where the rights of factory workers have attracted growing concern. Management systems for operations in lands where indigenous rights come into play could go a long way toward reducing the fallout from ill-planned mining and oil extraction operations. In light of the current accounting scandal generated by Enron's collapse, management systems seem a logical application to corporate governance. The dangers of governance breakdowns are not limited to the United States. The Asian financial crisis of the late 1990s owed much to the failure of corporate governance. A management and planning framework could prove helpful to industries where new technologies raise concerns of unplanned risks. Such frameworks might be the logical incubators of testing protocols to address the controversies pitting corporate interests against public interests. Genetically modified organisms present a deserving test case. These forward-looking management strategies could help avoid the ecological disasters that past industrial practices unwittingly created: PCBs, CFCs, tetraethyl lead, and so on. The effort expended to create such systems, however large, will always pale in comparison to the efforts required to reverse the unplanned and ill-fated alternative scenarios. ■

NOTES

- 1 The description here of an environmental management system is taken from definitions given in two papers from the Massachusetts Institute of Technology. The first paper is Jennifer Nash, John Ehrenfeld, Jeffrey MacDonagh-Dumler, Pascal Thorens, "ISO 14001 and EPA Region I's StarTrack Program: Assessing their Potential as Tools in Environmental Protection," Technology, Business, and Environment Program, Massachusetts Institute of Technology, Prepared for the National Academy of Public Administration, December 6, 1999. In this paper, the authors write: "Environmental management systems are formal structures of rules and resources that managers adopt in order to routinize behavior that helps satisfy corporate environmental goals. They are a subset of management systems in general." The second paper is Jennifer

- Nash and John Ehrenfeld, "Codes of Environmental Management Practice: Assessing Their Potential as a Tool for Change," *Annual Reviews*, 1997, Vol. 22, 487-535. The paper defines environmental management systems as such: "An EMS is the part of the firm's overall management system that establishes the rules a firm will follow to assign responsibility, focus attention, and allocate resources in the environmental area." EMSs are not limited to the private sector. Government agencies have also adopted the management systems approach to better organize their activities.
- 2 This was the lesson of the Massachusetts Toxics Use Reduction (TUR) program during the 1990s when TUR planners from the state would work with industries to develop interdisciplinary management programs for reducing waste byproducts and the use of toxic chemicals. The strategy was grounded in management systems. Author's personal experience. Also, see the Toxics Use Reduction Institute website published by the University of Massachusetts at Lowell, www.turi.org, and the Lowell Center for Sustainable Production website, <http://www.uml.edu/centers/LCSP/>, for literature on these issues.
 - 3 International Organization for Standardization, www.iso.ch/iso/en.html. The ISO 14000 series is an attempt to standardize the definition of a quality EMS. There are other quality codes that EMSs follow around the world. More and more, however, companies are using the ISO 14000 series as their benchmark and guidance.
 - 4 News stories around the world regularly report on markets that are requiring ISO 14001 certification for access. A few examples include the following: Phillips Business Information, Inc., "Ericsson's Environmental Kudos Don't Move Investors," *Communications Today*, December 11, 2001. Bernama, The Malaysian National News Agency, "A US\$30 Billion OEM Outsourcing Market Awaits," February 8, 2002. Asia Pulse, "Buyers Push Philippine Companies to Start Environmental Management," Asia Pulse PTE Ltd., July 13, 2000. Ford and GM have stated their requirements in their annual reports and on their websites.
 - 5 Nash et al., 7-10.
 - 6 Ibid: "ISO 14001 does not, by itself, ensure compliance but does ensure that a firm continuously improves its compliance programs," 9.
 - 7 Nash and Ehrenfeld, 493.
 - 8 The SocialFunds.com website, www.SocialFunds.com, provides a succinct overview of the history of SRI. Numerous articles in the print and online news media also reflect the growth in popularity of socially responsible investment alternatives. For example, see Anita Jain, "Socially Responsible Mutual Funds Win Hearts of European Investors," *The Wall Street Journal Europe*, November 14, 2000, 17. Also, Thomas Less, "Once unprofitable, ecologically responsible funds are becoming lucrative for investors," *Seattle Times*, March 26, 2001.
 - 9 Duncan Austin and Robert Repetto, *Pure Profit: The Financial Implications of Environmental Performance*, World Resources Institute, May 2000. This study is among the more high profile of a growing body of academic research into the link between environmental and financial performance.
 - 10 See www.globalreporting.org for a full description of the initiative and recent updates.
 - 11 Social Investment Forum, "2001 Report on Socially Responsible Investing Trends in the United States," SIF Industry Research Program, November 28, 2001, www.socialinvest.org.
 - 12 Masafumi Hikima, CFA, Nikko Asset Management Co., Ltd.; "New Horizons in Asset Management: The Japanese Experience," International Symposium, September 24-25, 2001, Zurich, Switzerland.
 - 13 Tamzin Booth, "Ethics Lesson: Principles Pay – Socially Responsible Investing Can Also Be a 'Good' Way to Make a Profit," *The Wall Street Journal Europe*, June 20, 2000, 31.
 - 14 International Private Sector Financial News, "U.S. SEC to Screen Company Annual Reports for Environmental Compliance," The Bull and Bear Newsletter, Volume 2, Number 10, November 2001, 2.
 - 15 Two outspoken critics of ISO 14000 have been Riva Krut and Harris Gleckman. They have written a number of articles challenging the standard. Riva Krut and Harris Gleckman, *ISO 14000: A Missed Opportunity for Sustainable Industrial Development*, Earthscan, 1998. Harris Gleckman, "ISO 14001: Promising Much But Delivering Little," *Business and the Environment*, April 1996, 1-6. Riva Krut principal author, "ISO 14000: An Uncommon Perspective," Benchmark Environmental Consulting study for the European Environment Bureau, Revised 1995.
 - 16 Ibid.
 - 17 Nash et al., 5.
 - 18 Austin and Repetto, 1.
 - 19 The three following citations are just a sample of the large volume of academic consideration of this topic. Petra Christmann, "Effects of 'Best Practices' of Environmental Management on Cost Advantage: The Role of Complementary Assets," *Academy of Management Journal*, 2000, Vol. 43, No. 4, 663-880; Donald J. Reed, "Green Shareholder Value, Hype or Hit?" Sustainable Perspectives, World Resources Institute, September 1998; Michael V. Russo and Paul A. Fouts, "A Resource-Based Perspective on Corporate Environmental Performance and Profitability," *Academy of Management Journal*, Vol. 40, No. 3, 1997, 534-559.

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- 20 Much information on DuPont's various environmental goals is included on the company's website in its environmental, health and safety section: www.dupont.com. Material here also was derived from direct contact with the company through KLD questionnaires.
- 21 Roy W. Shin and Yu-Che Chen, "Seizing Global Opportunities for Accomplishing Agencies' Missions: The Case of ISO 14000," *Public Administration Quarterly*, April 1, 2000, 69-94. Also, see Krut and Gleckman.
- 22 In April 2000, the Ebara Corporation revealed that despite obtaining ISO 14001 certification in 1997 for its plant in Fujisawa, Japan, the plant had discharged effluent containing high concentrations of dioxin from rainwater drainpipes for three years after certification. The pollutant discharges had started as early as 1993 and were not caught by the ISO 14001-certified environmental management system. Katsuya Yamagoshi, "Dioxin Scandal Shakes ISO Credibility," *Nikkei Weekly*, Vol. 38, No. 1, 922, April 10, 2000, 9. ISO 14000 Update, "No Link Found Between Management Systems and Performance," *Business and the Environment*, January 2001, Vol. VII, No. 1, 1. Also "ISO 14001 Improved Performance at Plants that Lagged Best Practice," *Business and the Environment*, October 2001, Vol. VII, No. 10, 1. The journal reports conflicting studies that seek to draw the link between ISO 14001 and improved environmental performance.
- 23 See U.S. Environmental Protection Agency website, <http://www.epa.gov/performance-track/>. The agency states on the website that it is developing more intensive incentives and rewards.
- 24 Jennifer Nash, "Can Environmental Management Systems Serve as Proxies for Performance?" Technology, Business, and Environment Program, Massachusetts Institute of Technology, PowerPoint presentation at KLD Research & Analytics, Boston, Massachusetts, November 27, 2000. The KLD axis followed the model developed by Nash using ambitiousness and trustworthiness as axes.
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