Planning for a Sustainable Future

The Ideas that Will Shape EHS & Sustainability Management in the Year to Come

Proudly presented with special support from these sponsors:

There's something special about being a professional association. Because this is a place EHS and sustainability professionals come to find community, NAEM members talk candidly about their challenges; they share their ideas and help one another solve problems. This provides NAEM with a unique level of access to what is going on inside of companies today.

From this vantage point, we have tracked the maturation of environmental management systems for the past 20 years. This inaugural trends report is our contribution to the conversation of what the future holds for corporate EHS and sustainability management in the year to come.

What we learned from this trends research is that the one-time promise that sustainability could become a business management paradigm has started to take shape. The leadership companies we spoke with have overcome the inertia and even the initial excitement that came with picking the low-hanging fruit, and are more thoroughly integrating the concepts into their operations and beyond their gates into the supply chain.

What lies ahead is a much tougher task. The programs of the future will be about redefining relationships, managing through influence, challenging expectations and leadership without clear rewards.

For the most part, this is a future of aspirations, but one we can foresee, and therefore, plan for. Even as the participants discussed their budgeted programs and talked about the issues that keep them up at night, though, they pointed toward an approaching future where systemic changes will be unavoidable. From a business perspective, the hope is that society and its leadership will have the wherewithal to collaborate the way leadership companies already are, for the health of the economy and the sustainability of us all.

Carol Singer Neuvelt
Executive Director
NAEM

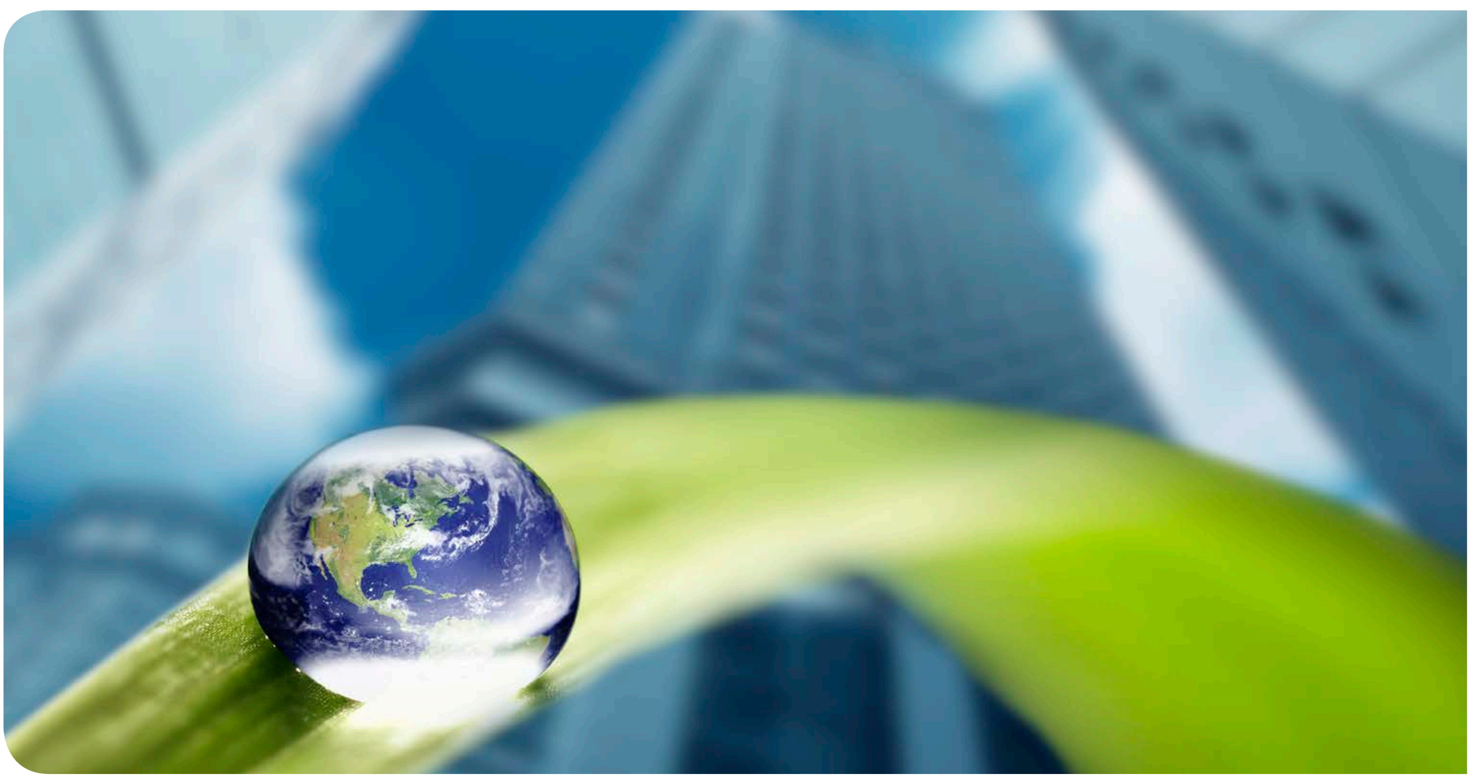
About NAEM

The National Association for Environmental Management (NAEM) empowers corporate leaders to advance environmental stewardship, create safe and healthy workplaces, and promote global sustainability. As the largest professional community for EHS and sustainability decision-makers, we provide peer-led educational conferences and an active network for sharing solutions to today's corporate EHS and sustainability management challenges. Visit NAEM online at www.naem.org.

Contents

Media Inquiries

For more information about this report or to request an interview with an NAEM analyst, please call (202) 986-6616.



Introduction

This report is a snapshot of the issues that are in the budgets and on the minds of 17 corporate EHS and sustainability leaders and eight (8) recognized experts from the broader environmental business movement.

What these conversations with corporate leaders revealed is a sophisticated, systemic understanding of the relationship between environmental health and business continuity. As such, there are no stand-alone issues or binary questions. Decisions about how to manage environmental issues are inextricably woven together with questions of risk management, resource scarcity, political will, brand value and ability to operate.

Some of these ideas may not be new. What we think is valuable, however, is this intimate look at where leading companies are on the sustainability maturity curve and how they are forging concrete business solutions to these complex business problems.

In our two decades of tracking the evolution of corporate environmental management programs, NAEM has documented the emergence of corporate sustainability, the development of initial "feel-good" programs and the definition of long-term sustainability goals. In this, the latest stage, we see the maturation of sustainability as a full-fledged, risk-based business management strategy.

In the following sections, we will identify the evidence of this transition in terms of macro trends, substantiated by the top program priorities for leadership companies this year. Those specific programs are:

- **Resource management:** Energy and water management are the main resource issues for respondents this year. Energy programs may include converting a generator from coal to natural gas, or developing a strategy to respond to California's cap and trade regulations or updating legacy assets to be more energy efficient. Water will also be a primary focus. If they have not done so already, companies plan to conduct water risk assessments, create water conservation visions and develop site-specific conservation strategies.

- **Product sustainability and compliance:** Driven in part by emerging regulations such as REACH and RoHS, companies are pursuing a number of programs to advance the sustainability of their products. These programs include product labeling, carbon footprinting of their products, substituting ingredients with green chemistry alternatives and engaging suppliers to reduce upstream impacts.

- **Supply chain transparency:** Companies are working to better understand the compliance challenges, reputational risk and business disruption potential of their supply chains, according to respondents. Whether the challenge is complying with the Security and Exchange Commission's rules on conflict minerals, creating data sheets for end-of-life recycling, or responding to customer requests, companies are intensely focused on seeking data from their suppliers.

- **New external reporting requirements:** Following a year in which materiality became the new rubric for external environment, social and governance (ESG) reporting, respondents seemed to be waiting to see whether the Sustainability Accounting Standards Board (SASB)'s framework would be adopted by the Security and Exchange Commission (SEC). If it is, "that's a game-changer for the reporting landscape for everyone," one respondent said.

- **Employee engagement:** As reflected in the agenda for the 2013 EHS Management Forum, employee engagement is core priority in 2014. Integrating sustainability into the fabric of an organization requires culture change at all levels and respondents are seeking new ways to effect that change.

- **Climate change adaptation:** Most of the participating companies had either conducted or planned to conduct a comprehensive climate risk assessment of their operations. At the urging of the C-Suite or Board of Directors many respondents said they were poised to transform those risk assessments into climate adaptation plans.

- **Next generation of sustainability goals:** Many companies have set sustainability goals that are set to mature by 2015. The strategic planning for the next generation of goals, therefore, has begun and will continue through the end of the year.

Of equal importance to what companies are actually doing, however, is how they are thinking about the challenges they face. Embedded within the quotes and examples in this report are signs that the values of sustainability have been appropriated into the decision-making of leadership companies today. Taken together, these themes form the paradigm within which sustainability is becoming a viable business management strategy. These concepts are:

- **Integration:** Whether reflected in the expanded role of the EHS function, in the erosion of traditional silos or in the introduction of new performance measures, companies are looking for new ways to embed sustainability into all levels of the organization.

- **Engagement:** While this concept was often used in the context of stakeholder relations and employee communications, engagement is about valuing various perspectives, and establishing a respectful dialogue as the foundation of a productive relationship.

- **Transparency:** As perhaps the most transformative themes of sustainability, transparency seems to have been adopted as a business management norm in the age of sustainability. It even has become a business driver in and of itself, particularly for product stewardship initiatives and for suppliers with a business-to-business orientation.

- **Collaboration:** Collaboration inherently recognizes the limits of an individual or individual company's capacity, while appreciating the shared benefits of collective action. The solutions to today's problems require a holistic approach, and every interview included a mention of collaboration with different types of business functions to solve problems in a systemic way, both within and external to the company.

- **Resilience:** Resilience is the development of a business organism that is responsive, interdependent and ultimately, adaptive. "Resilience is the first step on the journey to sustainability," one respondent explained. "If you can't deal with current pressures or the immediate abrupt changes that may occur in the near future then you're not going to achieve long-term sustainability."

In the following sections, we will explore these themes in the context of the broader trends that characterize where companies are on the path toward sustainability.

Methodology

This report is the result of 26 in-depth interviews with corporate EHS and sustainability leaders, as well as recognized experts in the environmental business movement for the purpose of:

- Identifying the organizational priorities for leadership companies around EHS and sustainability management
- Understanding the emergent issues that are on the minds, if not yet in the budgets of, leadership companies
- Establishing a benchmark for the maturity of EHS and sustainability programs within leadership companies

We opted for a qualitative approach in order to elicit more than a list of programmatic priorities. Our goal was to understand the strategies those programs are intended to support. We also sought to uncover the emerging issues that are on the minds of corporate leaders today, and the ones that will shape program development in the months and years to come.

In our experience of developing conferences for our members for more than 20 years, NAEM has found that this type of structured conversation provides a remarkably accurate portrait of what is going on inside of our membership companies today. And since NAEM members tend to represent those at the forefront of their industries, the programs that are timely priorities for the leaders tend to serve as a forecast of future best practices in corporate environmental management.

The 17 companies who participated in this report represent a variety of industries, sizes and positions within the supply chain. Some have a business-to-business orientation; others appeal directly to the end consumers. To provide additional context to our analysis, we also expanded our scope to include the perspective of eight (8) recognized thought leaders from the broader EHS and sustainability business community.

Each one-on-one interview lasted approximately one hour, and was conducted by a member of the NAEM staff. The interviews followed a common discussion guide, which included open-ended questions about the environmental issues and the projects that respondents are either working on or plan to address in the coming 12-16 months. To keep the conversations grounded in operational terms, we encouraged participants to provide specific examples and applications of the broader concepts whenever possible. If certain topics did not come up naturally, we introduced the topic to benchmark the issue from all perspectives. We also gave respondents the latitude to shape the direction of the conversation based on the issues that were driving their strategies.

Next, we analyzed the transcripts of the audio recordings from each interview to identify macro trends, program priorities and common themes. We used direct quotes throughout the report to substantiate these concepts, but left unattributed to the sources, per our agreement with the participants. To add color to the presentation of the results, attributed quotes have been added to the margins to illustrate particular ideas; these quotes have been approved for use by the respondents. Finally, we validated the accuracy by seeking feedback on the draft report from six participants, and incorporated their input as appropriate.

"Whether it's products or operations, compliance has to come first."

Laurie Zelnio
Deere & Company

Compliance remains a core focus as regulations continue to evolve

Compliance is a constantly evolving challenge. What often gets overlooked in descriptions of sustainability as "beyond compliance" is the reality of what it takes to maintain compliance in a global marketplace with regulations that continue to change on the local, state and national levels. Moreover, today's emerging regulations include a new emphasis on products (versus process), and may even codify some of the elements of sustainability that companies previously pursued voluntarily, such as green chemistry and greenhouse gas reductions. Indeed, the nature of the compliance challenge today requires sophisticated software systems, strong auditing programs and more engaged relationships with suppliers.

The explosion of state and local regulations

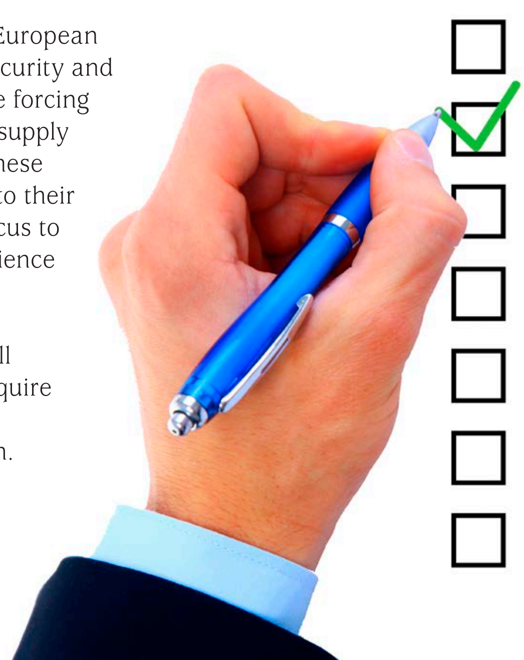
Local regulations are on the rise around the world. In the United States, the activity at the state level has introduced a patchwork of new requirements, many of which are more progressive than those at the federal level. In Washington state and in California, new storm water regulations will require measures to prevent storm water pollution into the environment; in California, a new cap and trade program will regulate greenhouse gas emissions, with the first phase starting in 2013 and the second phase starting in 2015. Overall, the inconsistency from state to state puts companies at risk of non-compliance. "The state governments are moving ahead in [the face of] federal [inaction] and companies don't like this. They would rather have uniformity and predictability," one respondent said. Another one described the challenge of overlapping jurisdiction: "Our biggest issue is the conflicts between different agencies," he said. "Federal agencies versus state and local… [The] same thing is happening on the permitting front."

Correspondingly around the world, in Europe, Registration, Evaluation, Authorization and Restriction of Chemicals (REACH) and Restriction of Hazardous Substances (RoHS) have created new standards for how companies test and disclose the ingredients in their products. As such, companies whose products are sold internationally, are complying with dozens of REACH-like regulations.

New regulations, new processes

With each new requirement comes a new set of questions, risks and demand for resources. The Globally Harmonized System of Classification and Labeling of Chemicals (GHS), adopted by the United Nations in 2003, for example, is a daunting logistical task for many companies. Many companies have literally thousands of material safety data sheets to update, which may require new training for employees and additional information from suppliers.

Other product compliance requirements, such as the European Commission's REACH and RoHS regulations, or the Security and Exchange Commission's rules on conflict minerals, are forcing companies to seek transparency from deep into their supply chains in order to comply with the new regulations. These new expectations are changing how customers relate to their suppliers and in some cases, adding a supply chain focus to the EHS function, which tends to have the most experience with interpreting environmental regulations.



Preparing for California's cap and trade regulations will also become an important issue in 2014. This may require re-permitting sites, purchasing offsets, and making investments in alternative sources of power generation.

"I think we're going to see external forces are going to drive the conversations... We won't be able to stay complacent for very long. New events will drive the conversation further."

Joseph Fiksel
Center for Resilience at The Ohio State University

Legacy issues still need attention

For many companies, aging equipment and legacy issues remain a major focus of their compliance investments. When discussing a recent environmental compliance review, one respondent said "the second part that it uncovered for us is that our biggest single risk in this organization is that we have 366 sites with underground storage tanks for fuel, mostly for vehicles of 15,000 gallons or greater and their 25-30 years old and were starting to see leaks. We have a huge risk, so we are going to replace or remove those tanks, depending on what's financially justified."

The business case for sustainability is getting easier to make

Compared with the case studies NAEM members shared even five years ago, the business case for corporate sustainability seems to be getting easier to make. Among leadership companies, the concept is widely understood both in theory, as well as in operational terms. These advanced efforts have rippled throughout the entire business ecosystem, spurring new attention to sustainability at all levels of the supply chain.

More widespread understanding of what it means

Broader cultural awareness of sustainability means that employees are coming to work with a better understanding of the topic, which makes it an easier sell for those seeking buy-in for their projects. This alignment includes those at the leadership levels as well, as sustainability has gone from an abstract external conversation to one that relates to what companies are doing internally. As one EHS leader with sophisticated sustainability programs told us: "After a few years of watching and listening and trying to understand what was being talked about with regards to sustainability, our team and myself and many of the professionals in our function said, 'Well that's what I do. Or that's mostly what I do.'" Indeed, according to NAEM's 2012 report on EHS and Sustainability Staffing and Structure, the top programs that respondents identified as 'sustainability' fall within the responsibilities of the EHS function: carbon footprinting, setting sustainability goals, energy and carbon management, sustainability strategy, waste recycling and water efficiency.

Regulatory requirements

Regardless of age or size, all of the companies we spoke with have a strong focus on meeting environment, health and safety, and increasingly, sustainability regulations. As product compliance, green chemistry, storm water and cap-and-trade regulations come into effect, many of the programs that companies are voluntarily undertaking today will be written into the formal regulatory requirements. The risks of non-compliance are easy to quantify, as they are associated with fines, bad publicity and even losing preferred-supplier status. Compliance also serves as the foundation upon which most sustainability programs are built, as one respondent described: "We believe as a fundamental basis of being a sustainable organization, we need to be compliant with environmental regulations."

Every customer is a supplier and every supplier a customer, which means that the growth of customer inquiries have affected everyone.

Demonstrated cost savings

Because many sustainability initiatives reduce the use of materials and improve efficiency, the business benefits are often inherent. These successful projects are then available as useful examples for future investments. Still, the business case matters for each new project, since values-based statements have little power to open the purse strings. "We don't use terms like 'it's the right thing to do'," the respondent said. "We try to certainly do the right thing, but we're also mindful of the business impact. We're not doing this because we're a charity."

Maintaining business relationships

Every customer is a supplier and every supplier a customer, which means that the growth of customer inquiries have affected everyone. As we'll explore in more detail in the section on supply chain, the emphasis on supply chain transparency is changing business relationships. Customers today are evaluating their suppliers on their sustainability performance in addition to their compliance, cost and continuity. Although the increased interest has not yet revolutionized procurement standards, suppliers expect sustainability to become a requirement for business in the future.

Investor interest

Investors' interest in sustainability is another driver for maintaining pace with sustainability programs and reporting. Although increased access to capital has not always followed the flood of inquiries from socially responsible investment research firms, according to NAEM's 2010 "Green Metrics that Matter" research, it's widely accepted that reporting is here to stay. And when environmental issues are a concern for the investors, they become a concern for the company, respondents told us: "Investors recognize the sustainable efforts. Keeping investors and shareholders is important."

Strengthening brand value

Brand value is among the more intangible–yet important–benefits of investing in sustainability programs, respondents said. Responding to investor inquiries and customer requests all ladder up to maintaining brand value. Among consumer-facing companies, where effective storytelling is an important part of the company's success, marketing and communications professionals continue to serve as the public face of sustainability.

Among business-to-business (B2B) companies, where the marketing efforts may be more focused on functional benefits, sustainability is also starting to take hold. "I'm trying to make them understand we can increase the top line and revenue," one sustainability leader told us. "Marketing isn't talking yet, but sales is starting to talk to me [because] when they go out, people are talking about sustainable products and services. People in the B-to-B world and the B-to-C world are asking us about our sustainability attributes and what we report. They are literally having companies say we want to do business with you…but we need you to provide the sustainability reporting." Some EHS and sustainability managers are also training their marketing teams in the Federal Trade Commission's guidelines for green product claims, to facilitate marketing products based on their environmental attributes. "I think other business are doing this already, but I think the whole environmental marketing is [in our industry] becoming a heavier pull to start doing that," one respondent said.

Since most companies manage EHS and sustainability programs through a consolidated function, leaders may need to prioritize the areas they can afford to manage.

Budgets remain tight as uncertainty looms

Although environmental sustainability is gaining a foothold, companies are unlikely to make any big investments in these projects in the coming year, according to those we spoke with. The combination of a weak economic recovery, uncertainty about potential regulations and political gridlock in Washington has dampened the appetite for big spending on sustainability projects in the year to come.

Competition for resources

In some cases, sustainability projects simply compete with compliance activities for both time and money. "Look at it from an environmental perspective, all the environmental regulations that we're having to deal with and address that are costing a lot of money," one respondent said. "So that's a lot of capital to go to compliance that can't go to the business because you've got to comply with the law." Since most companies manage EHS and sustainability programs through a consolidated function, leaders may need to prioritize the areas they can afford to manage, as one sustainability leaders told us: "We're at no shortage of things to do and wonderful ideas. I'm just limited by how many dollars I've got and how many people I've got to get things done. I've already loaded my plate up for how much stuff to put on. We'll shuffle things around a bit, but I guess we've done so much in the last two years that we really have a lot going on right now. Unless I find something really big within the next year, I'm probably in a position I'll have to figure out what to take off my plate."

Economic recovery remains weak

The U.S. jobless rate may have hit its seven-year low, but a slow economic recovery means companies are keeping a tight focus on their spending. "Economies are still not recovering in a way that a lot of people would hope that they would, so that means that you've got to really prioritize investments," one respondent explained. "And that's true for [us], that's true for every company." This means new hiring or capital investments in EHS and sustainability programs will likely remain on an as-needed basis in the coming year.

ROI is not always clear

Although the business case for sustainability is getting easier to make, it's still not easy. The leaders we spoke with described being under pressure to demonstrate quick returns on potential investments (two-to-three years in one case) and the need to generate profits for investors. One participant said his company aggressively invests in projects that will make money for investors, but those projects are initiated outside of the EHS and sustainability function: "The company is basically doing it and coming to us with the opportunity. There's no money on our side," he said.

In other situations, what's good for the environment may not offer clear cost-savings in the current business environment: "Sometimes you need to decide if a project is not a moneymaker but will save a lot of water, are you going to fund that by just doing the right thing?" one respondent said. "Right now, water conservation is costly; it's not a money-maker. I was in the room with a multi-national company who said they are being spun off to become a new entity and under the new entity, there will be no water conservation goals. They've had water conservation goals for eight years and had zero traction."

As NAEM learned in the 2012 EHS and Sustainability Staffing and Structure report, most companies are managing their sustainability program through cross-functional teams.

Government gridlock driving uncertainty

The federal government is expected to issue new regulations on greenhouse gas emissions, but ongoing gridlock in Washington, DC, including the debt ceiling fight and the government shutdown, has delayed action. According to those we spoke with, companies may decide to swap out natural gas for coal, but will wait until they get clarity from the government before planning any large-scale investments. “We have a paralysis in terms of public policy and we’re stuck with the status quo,” one respondent explained. “If [companies] can save energy, and time [they’ll go ahead with an investment] but companies won’t do anything bold since they don’t know what the playing field will be.” Political turmoil also seems to be hampering collaboration and spending on systemic solutions, which companies see as a key to creating a resilient economy and solving environmental issues over the long-term.

Sustainability is increasingly being integrated into all aspects of business operations

Based on NAEM’s research among its members, most leadership companies have set public sustainability goals, published an annual sustainability report and incorporated sustainability into the organizational chart. Upon this foundation, the companies we spoke with are now increasingly integrating sustainability into how they manage every aspect of the business, from product design and procurement to new employee orientation and marketing. Indeed, as one respondent said, “Companies at the leading edge have kind of moved through the phase where they heavily invested in central functions and they’re now trying to move it into the organization in a meaningful way.”

Building dream teams

As NAEM learned in the 2012 EHS and Sustainability Staffing and Structure report, most companies are managing their sustainability program through cross-functional teams. These teams, which are responsible for translating sustainability goals into operational plans across the business, most commonly include EHS, Corporate Communications, Operations and Legal. These results seem to hold true for those we spoke with for this report as well, who said they are similarly collaborating with other functions to “get things going.”

Collaboration across traditional silos is also happening in targeted ways, respondents reported. At one company, a cross-functional team has been working on new packaging. At another, the company has embedded a supply chain EHS team within the larger supply chain group. The solution to managing the upstream environmental risks for one large manufacturer was to permanently assign EHS staff members to the supply chain group. The respondent from that company explained it this way: “For the past two years, we’ve taken an environmental engineer out of our operations and put them into our product compliance group…We’ve started to understand the regulations and also what processes need to be in place and we’ve agreed to move forward with more of a shared services [model] so that our design centers, which are all decentralized can tap into the shared service on product chemical compliance.”

"We really need systems thinkers that can design solutions that are consistent and make sense with all of these different issues as they are interacting."

Daniel Vermeer
The Center for Energy, Development, and the Global Environment at Duke University

In addition to creating an internal think tank on product compliance issues, the company also assigned environmental engineers to the supply chain organizations in six different regions of the world. "They're an environmental engineer by training," the participant explained, "some of these people have been traditional EHS in operations in the earlier part of their career, but we've embedded them into supply management in those geographic regions for the sole purpose of focusing on supplier compliance and sustainability."

Incorporating sustainability thinking into systems, processes, decision-making

Sustainability principles are also being folded into business management processes and decision-making, according to respondents. One company recently completed a baseline life cycle analysis of its major products. This information will be added to a dashboard that design engineers can use to incorporate design-for-environment into their decision-making. Another company similarly plans to add sustainability into the research and development process by training its R&D teams to consider materials reductions, energy reductions and alternative materials in its plans.

Several respondents described efforts underway to use software to better manage their sustainability efforts. One company planned to embed microprocessors to make their products more energy-efficient. Another described its progress in using SAP to measure the cradle-to-cradle sustainability of its products from raw materials and manufacturing processes to emissions, sustainability of the supply and end-of-life disposal.

Including sustainability in employee training is yet another great example of how companies are weaving these principles into their operations. One participant described his company's plans to make sure everyone in the organization is trained in the EHS management system, as they already do for their enterprise-wide financial system. Another said her company already includes sustainability in its new employee orientations. Additionally, "there is an EHS committee at each of our headquarter locations," the respondents said. "Especially with younger staff coming in, they are a fresh set of eyes straight out of school so they will have ideas about how to improve [what we are doing]."

Embedding sustainability goals into performance targets

Perhaps one of the most promising strategies that companies are using is incorporating sustainability into performance targets. "What we found was that we could set the goals, but if they weren't really owned by the people who had to make them happen, they tended to fray over time," one respondent said. To overcome this challenge, the company assigned the sustainability goals to the product designers and other functions responsible for achieving them. "Part of it is also that it's an attempt for people to understand sustainability and environmental stewardship and safety are not just central EHS's idea. They are part of what we do as an organization," the participant said. At another company, sustainability performance has been added to supplier performance measures. Starting in 2012, the company added sustainability criteria to a program that rewarded suppliers for turning in cost-savings projects. Now suppliers receive extra credits toward more business when they turn in projects that both save money and reduce waste, energy or water. "This is a way for driving sustainable practices into our supply base yet weaving it into a program that we already had in place," the respondent said.

"The fact is that the amount of water that we have on the planet [and] in our bodies is all the water we'll ever have."

Gary Lawrence
AECOM

The new programs focus on the environmental risks within the supply chain

For many companies, their greatest risks – compliance, reputational and financial—are found within their supply chain. While government regulations, such as REACH and RoHS are important drivers for supply chain transparency, the emerging changes in how companies are operating seem to be motivated by customer requests. According to respondents, this new focus on a product's full life cycle impacts presents new challenges for suppliers, new ethical choices for customers and new business opportunities.

Customer requests are coming in

The demand for transparency seems to be affecting companies at all levels of the supply chain, with requests that pertain to everything from product carbon footprint analyses to the sources of key ingredients and specific environmental attributes across the spectrum of a company's EHS performance. To meet this expectation for transparency, some companies are rolling data collection into their routine supplier audits, asking questions such as: 'Do you have a sustainability vision statement?' 'Do you measure your energy consumption?' and 'Do you track your carbon?'. And as we'll discuss further below, suppliers are taking these requests seriously. "Requests that may have been ignored five years ago are today being treated with the same attention as a regulatory requirement," one participant said., "There is a lens on them from their stakeholder base to report accurately on their supplier base."

New expectations for suppliers

Although reporting remains largely optional, this soon may change: "Our customers are asking for it. They're not making purchase decisions on whether or not you can get it, but they may get to that someday," one participant said. In other cases, transparency has become an explicit supplier requirement. "We make it an expectation that to continue to work with [this company], our expectation is that our suppliers will be as sustainable as possible," one customer said. For another participating company, sustainability metrics are built into the supplier scorecard along with costs, performance and quality.

While customers are asking for more supply chain data, they aren't necessarily prepared (or able) to discontinue the relationship based on the results.

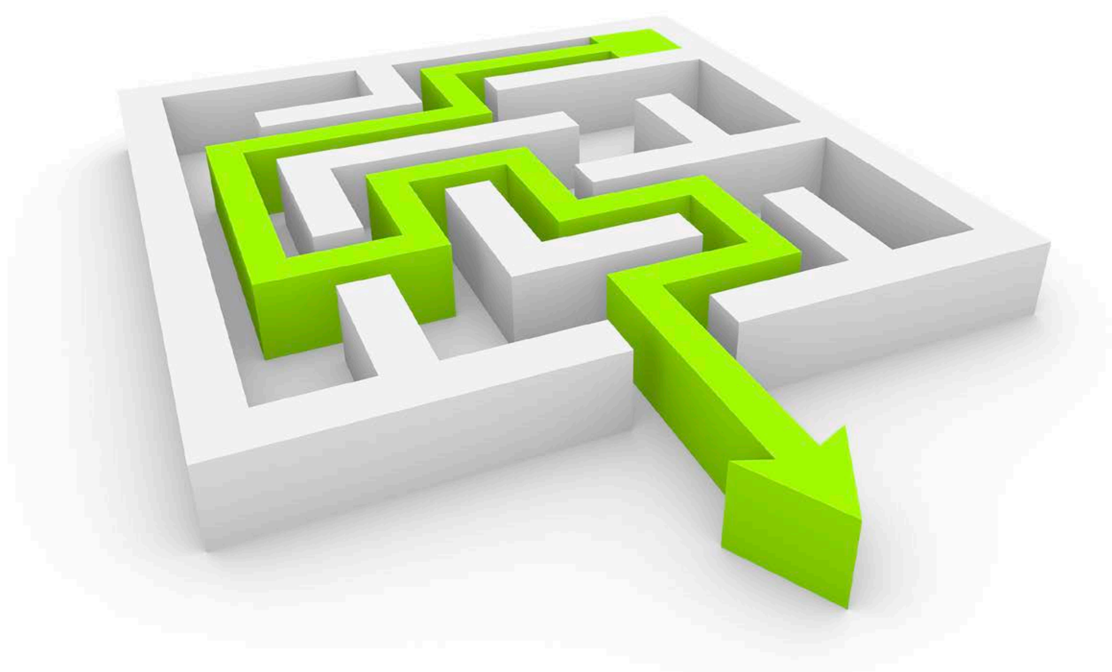
Again, the impact on a company's reputation is another factor that seems to be compelling more widespread disclosure. Some industry coalitions, for example, have started publishing audits results, which include a metrics on reporting. For another respondent, the company's mature environmental data management program proved to be a significant advantage when Wal-Mart started asking for packaging information. "We were lucky that we had that information," the respondent said. "It was exciting that all-of-a-sudden we went from a backwater position to a priority. One of my bosses went to a board of directors meeting [where someone asked] 'Why would we have this information?'...and we told them it is part of what we do."

Supplier challenges

The challenges with external reporting from a suppliers' perspective are very similar to those that large publicly traded companies first encountered when activists, research firms and investors first started requesting environment, social and governance (ESG), according to NAEM's 2011 "Green Metrics that Matter" research. Chief among these challenges are: questions about the relevancy of the metrics being requested, adequate data management systems and lack of capacity to meet the flood of requests. A company's organizational structure also may impede the reporting process. The highly decentralized structure of one supplier's company, for example, means that the company does not have an integrated database for collecting the data customers want at a corporate level. Suppliers that make multiple products may have difficulty parsing their energy data into precise information for each product.

New questions for customers

While customers are asking for more supply chain data, they aren't necessarily prepared (or able) to discontinue the relationship based on the results. As one respondent said, "The problem I see with the whole process is before you do the first audit, you really need to know how you're going to respond depending on what you find." According to one respondent, the inquiries function more as a way of managing the supply chain through influence. "The question is, 'Are you going to walk away from an otherwise good supplier because of their failure to reduce environmental impacts? I would argue that 99.9 percent of us won't. Suppliers know that. They might do it if they have a similar sustainability worldview but that's an inferential thing." If there are specific criteria in place, companies may provide technical assistance or coaching to specific suppliers to help them meet the standards. And in the case of at least one company we spoke with, suppliers that continue to underperform may be dropped.



"Climate risk is certainly something we evaluate every year. Because of the technologies and the sectors we serve, we think that our opportunity outweighs our risk."

Gretchen Hancock
General Electric

Management through collaboration

It's not always possible to replace certain supplier relationships, but respondents have started to collaborate with suppliers to change their behaviors. "Inference doesn't work; supply chain management has mostly been about inference for the past 10 years," one respondent said. "It may be that if you want your suppliers to do something, you're going to have to help them do it. Most suppliers are not of the size to have the resources to get this done." Technical assistance, on-site trainings and even in-person conferences to share best practices are all examples of how some respondents have started to deepen their relationships with their valued suppliers. In response to repeated violations of its supplier requirements, one large, U.S.-based manufacturer assigned six members of its EHS staff to work with suppliers in different regions of the world.

Effective risk management now includes environmental considerations

According to respondents, environmental considerations are now a core element of their risk management programs. While compliance risks and resource availability may long have been part of these evaluations, environmental risks are now much more pressing, due to the effects of climate change. This environmental risk analysis is being incorporated into long-term business continuity planning as well. Although it's impossible to parse concerns over resource scarcity from operational risks, we have highlighted the range of concerns, by outlining the various issues respondents mentioned in our conversations.

Evaluating resource and operational risks at the site level

The most palpable environmental risks to business operations are at the site and facility level. As a first step toward climate adaptation planning, many respondents said they had started analyzing the vulnerabilities of their operations. "We have done a lot of risk assessments already of our sites and are working on developing plans for our sites that are risk," one respondent said. "We haven't done a formal adaptation planning because we don't have sites that are vulnerable yet. We're just kind of embedding those issues into tour risk assessment process."

It's hard to talk about site-level risks, however, without getting into a conversation about resource scarcity. Understandably, water was a key issue for most respondents. For one participating company, this year's annual strategic plan for upper leadership included an emphasis on freshwater availability. As the respondent explained, "Operations that are in future projected water scarcity areas start that discussion with business leaders. What is not only our mitigation plan, but our personal adaptation plan to adjust to that change that we know is coming?" Another company used the World Resources Institute's Water Aqueduct tool to identify the sites with the greatest water risks. "We now know that there's a small segment of those sites that have been rated as high risk so now we need to delve in and work on: Why were they high risks? How critical is water to that site? and reducing the risk that we might not have the right to operate in future."

Companies also seem to expect that water will become a regulatory risk as scarcity increases.

While many of the issues may still be far off for many companies, these questions are already shaping decisions about where to build new facilities. "Siting is pure business. We are brought in to look at risks," one respondent said. "If we were putting in a new plant, water availability would be number one." Another participant similarly framed water as the foundation for doing business. "The worst thing for us as a company, or any company, [is] to do a construction of a new premier plant…and then three years later we are at a standstill because we don't' have the water or can't afford the water and the water price is bringing us to our knees."

Companies also seem to expect that water will become a regulatory risk as scarcity increases. "There are all of these competing interests, which have become a bigger issue. We have done modeling to try to figure out how to reuse some of the water that comes out of the plants in preparation for a new environmental regulation." Water is likewise a factor in supply chain management. This year one participating company is piloting a new tool that collects water information from suppliers.

Incorporating climate change into risk assessment models

While many of those we interviewed identified water scarcity as a core climate change risk, respondents revealed that risk assessment models include the full range of disruptions that climate change is expected to cause. As one respondent explained: "From an operations standpoint, looking at more assessments of what could more potential impacts of climate change mean for us: again, storms, floods, droughts, temperature changes, lots of things that could impact how our operations operate."

The analyses extend far beyond individual business operations to the questions that could affect the relevancy of product categories and supply chain disruptions. "What's the world going to look like when jet engine emissions are regulated?" one respondent said. "What's the world going to look like when sea level rise puts a lot of airports under water and disrupts air travel time and time again?" Sea level rise alone, one respondent pointed out, could affect the health of the entire economy. "In the U.S., a little more than 60 percent of gross domestic product is produced in coastal zones that will be affected by a one year rise in sea level," he said.

While the path forward remains uncertain, the debate seems to be focused on how to respond to climate change as a reality that no one company can stop on its own.

Companies are beginning to make plans for climate adaptation

Insofar as climate change has become an important variable in the risk management equation, many leadership companies are preparing to transform their climate risk assessments into actual programs that improve overall resiliency. Because climate change has already started to affect many businesses, one participant said the company's research and development team has already started the process of developing products to meet the new challenges: "We're dealing with it already because temperatures are changing, water is changing…so for any of our businesses, there are things that they're already adapting their products to be more successful as what we're seeing as climate change." While the path forward remains uncertain, the debate seems to be focused on how to respond to climate change as a reality that no one company can stop on its own. This was best expressed by one respondent, who said: "Nobody really knows what to do next. But we do need to recognize that we'll only have a certain amount of money to spend on uncertain futures and we'll actually have to design for adaptation rather than for something that we believe to be certain."

Reconciliation with climate reality is coming from the top

The realization seems to have sunk in that large-scale international cooperation on climate change may be unlikely, and many companies are shifting their expectations accordingly. "I think it's probably realistic that there's a narrowing window of opportunity to control climate change and an increasing urgency about dealing with its consequences," one participant said. "So, I think adaptation and resiliency are the themes more than mitigation at this point."

And according to respondents, the conversation around climate adaptation is coming from the C-Suite. The insurance industry, for example, has invested heavily in predictive models and analytics to determine future vulnerabilities, the results of which have started to permeate awareness at the highest levels of business, respondents said. This frank conversation about climate risk has been far from secret, however. In October 2013, insurance giant Lloyd's published a blog post debunking climate skepticism among some members of the business community. The company also affirmed its role in advancing adaptation and resiliency planning through its work with ClimateWise, an insurance industry collaboration. "The insurance industry has a clear role to play in shaping the climate change agenda, given its access to climate and claims statistics, sophisticated models and its essential risk transfer role," the company wrote. "All members commit to action against six key principles that encompass how the industry can push forward climate awareness, shape public policy making and conduct their individual businesses more sustainably.

Among the more perplexing challenges associated with climate change is sea level rise, due to its huge cost to infrastructure, communities and overall social stability.

This high-level awareness seems to have begun to reach the operational levels of business too. Earlier this year, one of the respondents was asked by the Board of Directors about whether the company had a climate adaptation plan. In the coming year, the company plans to prepare a climate risk assessment as the foundation of adaptation planning. In some cases, these are being conducted by the environmental team and compared to the company's existing risk management and risk identification programs, to identify potential gaps. As described above, other companies are incorporating climate risk into their overall risk management analyses.

Thinking through the adaptation questions

Among the more perplexing challenges associated with climate change is sea level rise, due to its huge cost to infrastructure, communities and overall social stability. In describing the types of questions companies will have to think through to manage the three feet of sea level rise that are expected by the end of this century, one respondent said: "So what do we do? Do we assume that we have to elevate all of the barriers three feet? What's the average opportunity cost with that versus investments in other kinds of infrastructure that are just as important? In terms of communications and those sorts of things, do we hedge our bets and maybe go up a little bit, but then actually design the little bit we did so that it's easier to add stuff on top of it as the future becomes more real?"

Some companies are also initiating conservation techniques to manage critical resources now. Others are developing models to prepare facilities located in drought-prone and flood-prone regions. Another adaptation strategy that came up was research into how to maintain the supply of critical agricultural inputs, which rely on specific climactic conditions to thrive.

While it may sound like a utopian idea today, conversations about adaptation are also touching on how to manage future earnings forecasts, given the economic changes that climate change is expected to exact. "I think there's going to be some test for us as we look at the long-term priorities, which become clearer and clearer, as, for example, you see the recent Intergovernmental Panel on Climate Change conclusions," one respondent said. "We've got to figure out how to re-order our priorities in a world where you're not going to have double-digit GDP growth that would lead you to think you can justify all that."

> "Culture is a really big thing for companies right now, because if you don't have that... you have nothing; you're just spinning your wheels. It's extremely important to business success in every way imaginable."
>
> *Sandy Nessing*
> *American Electric Power Inc.*

There's a new emphasis on employee engagement

Engagement seemed to be top-of-mind for those we interviewed. The leaders we spoke with consistently stressed the importance of engagement, which one respondent described as a critical success factor to achieving sustainable operations. "Having sort of gotten rid of the low hanging fruit, now we think it's also going to be even more important to emphasize the culture because we think the culture is what's going to get you that final 20 percent that we need," the respondent said.

Creating Meaningful Connections

To address engagement, companies are finding ways to make meaningful connections. For employees, being told by a manager to care does not motivate them to take an extra effort. It is also difficult for employees to adopt a sustainability culture if there is no support from the leadership. As explained by one respondent, "I think one of the indicators is total employee engagement, because you can have a site with a very over-zealous EHS staff that's really working hard to keep all of the plates in the air. But, if they're doing it all by themselves and leadership is not really behind them, they're not going to be totally successful… So it's not just EHS and maybe a few leaders at the top, but it's everybody in between."

To encourage engagement in a meaningful way, storytelling, education and training are being used to help make the personal connection with environmental sustainability. One respondent noted, "companies need to spend the time thinking about storytelling… Anyone who cares about this topic can talk about the moment when it hit them that they care so much. [We] need everyone to have a care moment where it hits them. You must create experiences and opportunities for employees to have their own ah-ha moment."

Engagement through project ownership

In some companies, employees have been tasked with finding the inefficiencies and resource-reductions at the operational level. These companies may use incentives for to engage employees in energy-saving practices. One company, for example, has created a target for 'sustainable savings' to encourage employees to identify opportunities for reductions. Once the company hits its target, half of all additional cost savings will be distributed to the employees. "The impact of that is that we're saving millions of dollars, becoming more resource efficient, being smarter about how you're spending your money." Through programs like this, companies are not only engaging their employees to reduce their overall environmental impact, but also saving money.

"Collaboration is becoming much more important. I see this less about our own operations and more about what are the big issues? If the world has to be able to feed at least 9 billion people by 2050, how are we going to do that? What are the barriers? And how do you bring the right players together to overcome those types of issues?"

Dawn Rittenhouse
DuPont

Its time to collaborate

One of the most consistent messages we heard from our conversations is that collaboration is becoming a key management approach. "If you think about it, not a single one of us has all the answers or the resources to address those things," one respondent said. "But collectively, we have much more opportunity to get to the right solution than if we were to try to do it separately or individually," one respondent said. The appetite for collaboration extends in all directions, both internally across silos and externally with groups of all kinds, respondents said.

Giving stakeholders a seat at the table

While stakeholder engagement is not a new story, what struck us as noteworthy was the extent to which stakeholder input has become a valued part of the goal-setting and strategic planning process at leadership companies. One company, for example, holds multi-day meetings with stakeholders each year to seek their input and discuss the company's progress against the goals they jointly set: "They talked to us about our strategy, they consider themselves to be the shepherds of our 2015 sustainability goals," the respondent said. "That kind of perspective has helped us think about collaborations in a different way." Another respondent talked about turning its focus to biodiversity as a material issue for the company, because of the number of inquiries they have received from stakeholders. "We do materiality assessments on things that our stakeholders care about," the respondent said. Still another company added endocrine disrupters to its list of next generation goals after a stakeholder survey identified it as a core issue.

Indeed, incorporating the feedback from those outside their walls has become a norm among many of the leadership companies we interviewed. One participant summed it up this way: "Seven or eight years ago, we didn't do that kind of engagement. It did not occur to us to do it. Over time, it has now become the norm in terms of how we think about what we're doing, the decisions we're making and how we run our operations. I frequently hear managers asking, 'What would the stakeholders think about this?' the stakeholders could be a regulator, an environmental group, a lawmaker, a policy-maker, a customer, an employee. It's that thinking that is now embedded into the company.'"

Starting a sustainability conversation with government at all levels

Among respondents, one of the areas in greatest need of more collaboration is between business and government. This issue arose in almost every conversation as a key opportunity for not only accelerating sustainability, but also managing future risks. For one manufacturer, this type of collaboration includes working closely with regulatory agencies. Most recently the company leveraged this engaged relationship to maintain business continuity while it transitioned away from a newly banned substance. The company asked the regulatory agency to give them time to get their recycling take-back program up and running, so they could recycle the regulated component for use in the company's processes. For another respondent, the mere act of keeping the lines of communication open is key. "You have to be engaged, otherwise you have no credibility and won't be able to get done what you need to get done." An example of collaboration in action is the agreement this participant struck between other companies in the operating three-state region that were all drawing water from the same source. Thanks to this engagement, the three states signed an Interstate agreement for trading water quality credits. This allowed the company to avoid the huge capital costs of installing equipment for its own facilities alone.

According to some participants, the absence of government leadership in core areas makes it incumbent on business to play a leadership role in articulating its needs for public spending, regulatory certainty and action on the environment.

According to some participants, the absence of government leadership in core areas makes it incumbent on business to play a leadership role in articulating its needs for public spending, regulatory certainty and action on the environment. In reflecting on the current gridlock in Washington, one respondent said: “[It] doesn’t’ mean that we can’t continue to move forward, but it does mean that the private sector has to lead—but not in a non-collaborative way. In a way that points a path forward.” Another leader echoed those remarks by noting that the conversation with government had already started. “Businesses aren’t waiting to see what the government will do, but actively trying to influence government policy and help them understand the forces that are propelling them in different directions.”

The call for collaboration also included an appeal to government to overcome the limits of its own siloed structure. “One problem with water and government control is that it is so fragmented throughout the federal government,” one respondent said. “[There] needs to be more collaboration between government agencies. We can’t afford to work in silos anymore.”

Building Business-to-Business Relationships

While industry coalitions such as the Sustainable Apparel Coalition and the Roundtable on Sustainable Palm Oil are relatively well-established already, there are a couple of noteworthy areas where respondents said greater collaboration is needed. The National Association of Manufacturers, the U.S. Chamber of Commerce, the unions, the Electronics Industry Citizenship Coalition and the Association of American railroads, for example, are all working on collaboration on environmental issues.

Partnering with customers

Purchasers and suppliers alike are working together to reduce waste. One respondent explained, “We work directly with a number of our customers to help achieve or implement some of those solutions. So we’re working with like 10 customers right now on a variety of projects from product recycling to reusable packaging. Now, we’re working with some suppliers like indirect materials suppliers.” Regarding packaging, another respondent said, “We’re working with a customer to try and go from a cardboard box to a plastic, returnable tote as part of a design for the environment project. By trying to eliminate the cardboard and go to a plastic returnable tote that would go all the way upstream from the manufacturer to the customer.” This type of collaboration to create re-usable packaging is mutually beneficial. It helps suppliers reduce their need for packaging materials and reduces waste for purchasers.

> "The risks most threatening to us are the ones we've never experienced."
>
> *Joseph Fiksel*
> *Center for Resilience at The Ohio State University*

Engaging the Board

As mentioned before, without the support from leadership, it is extremely difficult for a company to truly incorporate sustainability as a way of doing business. When discussing how leaders are getting involved in sustainability, one respondent said, "If senior leaders are demonstrating that willingness to listen and be open to the outside, imagine the power when they start doing that on the inside, which is what's happening." The leadership at this company holds meetings with operational staff to better understand the environmental inefficiencies at the plant level, engaging them in the same passion their employees have for reducing environmental resource use.

At another company, the Board of Directors is highly involved in environmental metric reporting. As the respondent described, "They actually have oversight of the report itself. They read the report cover to cover. Every last word. Everything. They have great discussion, ask lots of really good questions, change things sometimes. They have made positions on policy issues stronger and they vote on it, then send it to the full board for a vote. They take it pretty seriously. It's the partnership that you have internally that help you to stay ahead of the curve."

There's a growing awareness that resilience will require a longer timeframe for strategic planning

An extended look at risks naturally lends itself to longer-term thinking and planning. Not only have companies started to evaluate their risks from a systemic standpoint, but they have started to discuss how to incorporate long-term risks into business decisions they are making today.

Going beyond the five-year goals

While many sustainability goals are set against a five or ten-year horizon, some companies are now setting their sights on points further along the horizon. One company has set a 2040 goal to eliminate greenhouse gas emissions from all of its manufacturing sites. Another noteworthy example was a company that has been working from a 10-year budgeting cycle for almost two decades. The company broke its shorter-term planning cycle when a group of its EHS leaders approached the leadership in the 1990s to ask for $1 billion on a set of 10-year goals. The investment, they promised, would reduce compliance risks, reduce environmental emissions and achieve a 30 percent return on investment within ten years. "All that takes time and can't be resolved in a 12-month period. It just doesn't work unless you want incremental change, which is not what we're after," the respondent recalled. The leadership consented, and the company wound up saving more than $5 billion on the initial investment. "And that changed the company," the respondent said. "We figured out that we have to take the long-term view in a short-term world."

Companies are evaluating the long-term viability of their supply chain

With this longer-term perspective in mind, companies are also taking a fresh look at the viability of their supply chain relationships. One respondent described the supply base as the "thing that keeps her up at night" worrying that some suppliers do not have the capacity to keep up with the rate of change, the regulations and the requirements that are coming. "I think the concept of resilience will become something that people will spend more time thinking about" another participant said. "What does that mean and how do I think about that across my whole supply chain? My raw materials, my own operations, my customers and how do we improve resilience of that whole supply chain?"

Others are starting to consider whether it makes sense to unwind potentially unstable business relationships in a measured way today, before they collapse under foreseeable pressures tomorrow.

Respondents also cited examples of specific climate risks that could one day prove insurmountable obstacles for certain suppliers. “If you then go forward 20 years where a few of those things may be less viable because of sea level rise or because of a handful of major storms that makes the Philippines less resilient and less able to serve as a supply chain conduit for its key components you then have to step back and say, ‘Ok, if you don’t want your business to be disrupted by those things, how do you define resilience?’”

Acting today with the future in mind

While most of the companies we interviewed do not seem to be setting their budgets on a ten-year cycle, respondents did say they are increasingly making decisions today with the future in mind. As we discussed in the section on risk management, companies are considering issues such as water scarcity and climate change in the development of new facilities. As one respondent described, “It made good business sense for us to do it the right way. We are starting to embed that kind of mindset into all of our new constructions: making sure they are energy efficient, water efficient right from the start.” Others are looking at how local conditions are expected to affect energy costs and Scope 2 emissions. “We don’t have a strategy yet, but [we] are investigating that [so] we at least understand what we should be looking at and figure out what it means for five, 10, 20 years from now,” one participant said. Still others are starting to consider whether it makes sense to unwind potentially unstable business relationships in a measured way today, before they collapse under foreseeable pressures tomorrow. One respondent in particular described this scenario as follows: “You’ve got to totally look at the business model and say, ‘What is not sustainable about this model today? What needs to change about it? And let’s not put our heads in the sand here. If we cannot be doing business together in five or ten years, let’s figure out a plan so that we can unwind this dysfunctional model and have as few people hurt as possible”

> “What is going to be the combination of public policy and technology advances and culture changes that transform us into a human society that’s sustainable on this planet?”
>
> *Mark Weick*
> *The Dow Chemical Co.*

Innovation offers solutions, opportunities

While acknowledging the scope of the challenges, many participants see the future as a landscape where innovation will thrive, and indeed, be required for business survival. Solving these systemic problems for their customers is part of the sustainability puzzle that goes beyond operations to opportunity.

Environmental challenges are creating new business opportunities

It turns out that the greening of business is giving birth to new business opportunities and new models to meet existing needs in innovative ways. For railway company BNSF, consumer interest in the carbon footprint has been a boon for its intermodal business. Trucking companies, which might otherwise be seen as a competitor, are actually marketing this intermodal transportation to their customers, using rail for the long distances and trucks to move the products to and from the freight depots. The company recently opened new buildings in Memphis and Kansas City to keep up the demand.

Some companies are using third-party partnerships to operate in an innovative way. Third parties are used to assist in take-back programs and price the most economical alternative energy option, depending upon site location. To ease recycling take-back programs, one company uses retailers as collection sites to ensure recycling of used product. Another major manufacturer that looks at energy sourcing in a different way stated: “We paired up with a third party where we agreed to buy their energy and they agree to find the alternative energy that works for each site through a power purchase agreement.”

Other companies are testing new business models along the principles of the “shared economy,” which gives consumers access to products without the need to purchase them. There are also discussions underway around how to sustainably and affordably meet the needs of the developing world, which is expected to drive growth in the coming decades. Indeed, this type of adaptation is expected to be a differentiator for future business success, as one respondent explained: “Those who do use new business models will be the great leaders of the future.”

Looking to nature for solutions

Ecosystem services are a strategic and innovative way to plan for the quality of future resources and environmental conditions, respondents said. Multiple respondents are currently working with the Nature Conservancy to better understand the value of ecosystems to contributing clean air, clean water and storm surge protection to their operations. During a recent site-level assessment, for example, one respondent said, “it turns out that uniquely, for that area, that reforestation is an economically viable option versus some gray infrastructure, chemical engineering solutions that we would put in place to mitigate [air] emissions.”

> "Nobody really knows what to do next. But we do need to recognize that we'll only have a certain amount of money to spend on uncertain futures and we'll actually have to design for adaptation rather than for something that we believe to be certain."
>
> *Gary Lawrence*
> *AECOM*

Advancing sustainability will require new thinking and systemic changes

As they look forward to setting the next set of goals, however, many industry leaders have started to describe the types of systemic changes that will be necessary to advance the movement into the future. "It's going to take resilience on a collective level, not just individual companies coping with their own risks," one respondent said. "It's going to take working with the states and local governments to agree to pretty significant shifts in policy and a commitment to long-term goals to change the game."

Community investments and infrastructure will be key

When Hurricane Sandy hit the East Coast of the United States in October 2012, the vulnerability of the nation's infrastructure went from a future concern to an immediate business risk.. As we discussed in the section on climate change adaptation, companies and communities are starting to evaluate their vulnerabilities to climate-related events. This honest look at the issues is leading to policy discussions about whether public funds should be used to reinvest in certain communities, a question that carries grave consequences for the companies located there. "In the long run, nature always wins," one respondent explained. "So the question is, 'Now that we know what we do about the variations, the power of nature in certain zones, what's the right combination of things to do, versus what is the right, single solution?" Whether the solutions include burying electrical wires, rebuilding sand dunes or even purchasing coastal land to relocate entire communities, they will almost certainly require large public investments.

Similarly, water management is another area in which some companies expect—and indeed want—government to take the lead. "The reports I have read say the water flowing down the Mississippi is several times greater than it was when we first got here, so we're actually taking our resources and shoving it down the bay when we should be taking it and replenishing our aquifers," one respondent said. "The City of Philadelphia is putting in a very forward-looking storm water management system. I think as a country we all need to implement that to get the storm water to stay and percolate…The problem is that is' a long-term issue. You can't just start filling up those aquifers. It's going to take years."

"The emergent risks result from a nexus of coupled systems."

Joseph Fiksel
Center for Resilience at The Ohio State University

Taking a systems approach to problem-solving

Some issues simply require a systemic solution, as one respondent put it best: "We really need systems thinkers that can design solutions that are consistent and make sense with all of these different issues as they are interacting. So I think that's a big theme, the kind of attempt to have more systemic, integrated models for managing these issues."

One of the most commonly mentioned examples was the water-energy nexus. "Water is a huge issue," one respondent explained. "You need water to produce energy and energy to produce water [sic]. There's the nexus there, which is a huge issue just coming onto the front burner…There's all these competing interests, which has become a bigger issue." For more than one company, this interdependency has already affected operations. In the case of one company with a factory in Kenya, a recent drought forced the facility to reduce its use of hydroelectric power. "They were forced to go to non-green sources so we're looking at how the local conditions affect the utility in terms of costs and GHG Scope 2 emissions," the respondent said.

Other respondents considered agriculture to be another inextricable part of the water-energy equation. "You're much better off thinking about food and water and energy as a set rather than as discrete ideas," one respondent explained. "There is not food without water. There is no water getting to agricultural areas without electricity to drive pumps. There's no getting the food from the market where it's grown to the marketplaces and converted into edibles without other forms of energy." Our success at managing these competing interests could ultimately affect social stability and long-term business continuity. "Much of our growth will likely take place in the developing world over the next 20 years and without social stability and the capacity to govern, then the rule of law isn't there and we can't work there."

Balance sheets should reflect environmental cost accounting

Even as sustainability has been increasingly integrated into a variety of business management systems it does not seem to have penetrated its accounting or balance sheets—yet. Many respondents described the need for accounting practices that could incorporate the true value of natural resources. "Some assets are in there, but if you were to include the externalities, the price would be higher. Look at what the price would be if we had to pay for these raw materials or if we could not get those raw materials. Also look at stranded assets. How do we get to a point where the balance sheets show the real world value?"

Water was a specific area of concern that many respondents said was undervalued under the current frameworks. But respondents did raise the question of how best to assign a 'value' to resources such as water, since price is not necessarily aligned with its true worth. One company,

Companies need to develop new business models to meet the same market needs without the lasting impacts.

for example, initiated water conservation efforts at a facility in Texas, after doing a holistic analysis of the value of water to the operations. Water conservation made sense, the respondent said, "from an economic standpoint when you really value the water. Not just looking at the current cost of water, not just looking at the current price on the water…but the price and the value don't necessarily correspond. So what you have to do is look at not only the current price but at the value over the next ten years to a variety of stakeholders: your own industrial operations, municipalities that are growing in the area, agricultural interests that are growing in the area and the ecosystems themselves that need a constant flow of freshwater."

A set of similar questions arose with regard to the role of ecosystems services to provide a sort of natural infrastructure for business operations. "How do you value them [ecosystems services] in business terms so people don't think, 'Oh yeah, the air's always going to be clean around here' or 'The water's always going to be there' or 'There's not going to be any sea level rise or 'The pollinators will just keep on coming.' Those are stupid assumptions when you look at ecosystem decline. There has to be a way for business to value them the way they value labor costs, value costs of capital, value costs of equipment, value costs of land."

Consumers need to understand the real cost of their purchases

A related challenge is helping consumers understand the full cost of their purchases. While consumer interest in environmental impacts and labor practices has helped accelerate the drive for transparency across the supply chain, the costs of their choices remain opaque at the point of purchase. Without a widespread alignment between the values consumers purport and those they act upon, respondents said it will difficult to stem the drive to the bottom line. "If you have a cash cow in a product and something is making money now, why would you change?" one respondent said. "If you ask people on the street, they say they would never support child labor but they pick up the cheapest product even though they are aware it's impossible to produce it for so little money."

Reconciling cost with consumer expectations for different types of business practices will not be enough to solve the problems ahead, however. Respondents said that companies need to develop new business models to meet the same market needs without the lasting impacts. "I think companies particularly have struggled with the whole concept of sustainable consumption. But I think more and more that's going to become a topic of discussion of 'What is sustainable consumption?' How do we start driving people?...As resources become more stressed across the world, how do we think about the things we do differently?"

Wall Street needs a new way of measuring business value

Finally, changing the short-termism of the financial system could go a long way toward giving businesses the latitude they'll require to invest in long-term business success. This could start, one respondent said, by breaking the expectation that quarterly earnings will always rise. "When I as a business leader back in the 90s and somebody asked me about my projects, I would say, '3 percent better every year over the last,'" one respondent said. "That's stupid. That's not going to be the way business can be done over the next ten years." On a broader scale, the entire definition of growth will eventually need to change to align with the concept of sustainable consumption. "We're going to have to figure out some ways to define growth in a sustainable way. It's going to have to be a situation where people look less at gross domestic product (GDP) or gross national product (GNP)."

Participating Companies

NAEM would like to gratefully acknowledge the participation of the advisory panel who contributed their perspectives to this report:

Todd Brady
Global Environmental Director
Intel Corp.

Brian Burnikel
Senior Manager, EHS Environmental
The Boeing Co.

Jim Cline
Director Environmental Affairs and Sustainability
Cardinal Health Inc.

Thomas Day
Chief Sustainability Officer
United States Postal Service

Christine Diamente
Head of Corporate Social Responsibility
Alcatel Lucent, Bell Labs

Joseph Fiksel
Executive Director
Center for Resilience at the Ohio State University

Deb Geyer
Vice President, Environment Health & Safety
Stanley Black & Decker

Gretchen Hancock
Manager, Resource Optimization
General Electric Co.

Chad Holliday
Founder and Managing Partner
East Meets West Solutions

Scot Holliday
Partner
East Meets West Solutions

Johanna Jobin
Director, Corporate Responsibility
EMD Millipore Corp.

Helle Bank Jorgensen
President and CEO
B. Accountability

Linda Kurtz
Corporate Environmental Manager
Wm. Wrigley Jr. Co.

Gary Lawrence
Vice President, Chief Sustainability Officer
AECOM

Annie Longsworth
CEO North America
Saatachi & Saatchi S

Rick Love
Manager, Environmental Sustainability
United Technologies Corp.

John Lovenburg
Vice President, Environmental
BNSF Railway Co.

Sandy Nessing
Managing Director, Sustainability & EHS Strategy & Design
American Electric Power Co. Inc.

Dawn Rittenhouse
Director of Sustainable Development
DuPont Co.

Mark Serwinowski
CEO and Founder
MetaVu Inc.

Dan Vermeer
Executive Director of EDGE
Fuqua School of Business at Duke University

Samuel Waldo
Director of EHS & Support Services
Amphenol Corp.

Mark Weick
Director for the Sustainability Program Office
The Dow Chemical Co.

Laurie Zelnio
Director of Environment, Product Safety, Energy
and Sustainability
Deere & Co.

Robert Zimmerman
Environmental Project Manager
The Campbell Soup Co.

NAEM gratefully acknowledges the support of the following sponsors who made the production and dissemination of this report possible:

Dakota Software
Enablon
KMI