

Going Green, Upstream

**The Promise of Supply Chain
Environmental Management**

Executive Summary

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The National Environmental Education & Training Foundation's
Green Business Network



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In the past several years, supply chain environmental management (SCEM) has emerged as a powerful tool for companies to reduce their environmental footprint; manage risks to their brand, reputation and production processes; build customer loyalty; and develop innovative new products and processes.

The National Environmental Education & Training Foundation (NEETF) has a particular interest in meeting the needs of often-underserved small- and medium-sized enterprises (SMEs) for useful information and assistance in addressing environmental issues and increasing competitiveness through environmental improvements. NEETF recognized that supply chain environmental management offers a way to reach and motivate SMEs to improve their environmental management and undertook this study to better understand the potential of this approach. NEETF is a private, non-profit organization chartered by Congress in 1990 that develops and supports environmental learning programs to meet social goals, such as improved health, better education and “greener,” more profitable businesses.

NEETF conducted background research, interviewed 10 SCEM program leaders from diverse industries and analyzed interview findings to identify program approaches, common challenges and strategies companies use to address the challenges. Companies participating included representatives of the automotive, pharmaceutical, food and office equipment industries. Although the sample size and study methodology do not allow quantitative analysis of the information gained through interviews, several themes did emerge. These findings, summarized below and presented in full in the following pages, are expected to be useful to companies starting or improving SCEM programs and to governments, non-profit organizations and others interested in the potential of the SCEM approach.

What is Supply Chain Environmental Management?

Supply Chain Environmental Management is a broad term that refers to a variety of approaches through which companies work with their suppliers to improve the environmental performance of the products or manufacturing processes of the supplier, customer or both. The targets of SCEM programs vary widely. Examples include:

- A focus on reducing or eliminating materials used in manufacturing processes or products.

- A focus on the environmental compliance status and practices of supplier operations.
- Joint development of new materials, processes or other solutions to environmental issues.

The methods companies use to work with their suppliers also vary and include:

- Requiring suppliers to implement, and possibly certify, environmental management systems.
- Educating suppliers about materials use, pollution prevention, design for disassembly or other issues and tools of interest to the customer company.
- Enlisting suppliers' help in developing new materials, parts or processes to address environmental concerns.
- Auditing suppliers' compliance status.

Why do Companies Engage in Supply Chain Environmental Management?

SCEM has emerged as a response to several long-term trends. Just as the early part of the 20th Century was characterized by consolidation of vertically integrated companies in major industrial sectors, the latter part of the century was characterized by outsourcing of functions and manufacturing processes. Yet companies remain critically dependent on their suppliers to deliver promptly goods of the needed quality at competitive prices. Environmental issues of suppliers could affect any of those critical elements. Conversely, suppliers can be a source of expertise and innovation in helping their customers address environmental challenges.

The emergence of pollution prevention strategies has also helped to shift the focus of environmental improvement efforts from the factory's four walls, smokestacks and discharges, to the “upstream” functions where choices are made about materials, processes and the products themselves—choices that often involve suppliers.

In addition, companies have learned through painful experience that customers do not draw a bright line between the activities of the brand owner and its suppliers. To protect their brand equity, many companies are closely examining the environmental profile of their suppliers.

Against the background of these general trends, companies are motivated to pursue SCEM by a variety of internal and external factors (*see Table 1*).

Table 1: Motivations for Undertaking SCEM

Primary Motivations	
Internal	External
<p>Risk management</p> <ul style="list-style-type: none"> • supply interruption • long-term risk to human health and the environment • competitive disadvantage 	<p>Enhanced brand image</p> <ul style="list-style-type: none"> • potential to improve public image as responding to environmental concerns • corporate culture of forecasting trends and moving proactively
<p>Regulatory stance</p> <ul style="list-style-type: none"> • desire to go beyond compliance • potential for suppliers to provide materials containing problematic substances • supplier non-compliance may pose production risk 	<p>Customer pressure</p> <ul style="list-style-type: none"> • often appears in conjunction with a threat to brand image • frequently focused on high-profile brands
	<p>International purchasing restrictions</p> <ul style="list-style-type: none"> • eco-labeling and product takeback gaining momentum • may drive the creation of systems for collection, transport, and disassembly or recycling
Secondary Motivations	
<ul style="list-style-type: none"> • Cost reduction as suppliers apply pollution prevention • Enhanced quality 	<ul style="list-style-type: none"> • Increased innovation—can result from supplier participation in new product development

SCEM Programs are driven by Company Characteristics (there is no “one-size-fits-all”)

NEETF’s review of 10 SCEM programs found considerable variety in terms of the goals of the programs, strategies to achieve these goals, and how the programs are organized and staffed. This variety is to be expected at this early stage of development of the field and reflects the characteristics of the companies initiating the programs. A cookie-cutter approach to designing an SCEM program would not likely be successful; programs must reflect the organization’s unique challenges and opportunities. In addition to the company’s motivation to undertake SCEM, characteristics that emerged as most important in influencing SCEM program design and implementation were the company’s “operating context”—including its products, production processes and its relationship with its supply chain—and the resources it devotes to designing an SCEM program. (see Tables 2 and 3).

The company’s motivation for undertaking an SCEM program seems to have several effects on program design and implementation. Internal motivations (such as risk management and regulatory philosophy) are relatively robust in their ability to overcome challenges, mostly because they assume an internal “champion,” often at a high level of management. Companies motivated by external factors (customer pressure, brand image, international purchasing restrictions) tend to focus on more limited goals, at least initially, although these programs may evolve and grow into more systemic initiatives as positive experience accumulates.

The company’s motivation for instituting a program also affects its intensity (the amount of interaction engendered by the program within the company and with its suppliers) and its integration into various departments or business functions.

SCEM Program Design Addresses Common Challenges

Despite the diversity found in company operations and relationships with suppliers, SCEM program designs involve common elements that respond to shared challenges. These include:

- Making the case to undertake SCEM;
- Targeting the program;
- Selecting approaches to address the chosen targets;
- Setting goals;
- Allocating resources;
- Integrating with core corporate objectives; and
- Measuring progress.

Companies participating in this study reported that *making the case to undertake SCEM* is the phase of SCEM program development requiring the most interpersonal skill, political savvy, and knowledge of company practices and cultures. It is challenging because SCEM does not yet have a robust collection of case studies across a variety of industries to demonstrate the economic benefits of the programs. In addition, effective SCEM programs often require cooperation

Table 2: Company Characteristics as an SCEM Program Design Consideration

	Complex Systems Mfr. <i>(e.g. automobiles)</i>	Diversified Products Mfrs. <i>(e.g. health care products)</i>	Mass Market Consumables <i>(e.g. food, clothing)</i>	Basic Manufacturing <i>(e.g. chemicals, paper)</i>
Products	Product and many component parts are complex and difficult to modify.	Products and component parts relatively simple and in some cases can be modified by changing suppliers.	Products under tight scrutiny because of close connection to consumers.	Less product complexity compared to other categories. Supply chain interaction focused on proper transport and management.
Production Processes	Customers and suppliers may share some unit operations, allowing mentoring and joint projects.	Because of segmentation and specialization, many processes are relatively simple. However, a number of different variables makes change difficult. SCEM programs focus on management systems and regulatory compliance.	Extraction-focused processes lead to sustainability goals for SCEM; conversion-focused processes have goals to reduce use of toxic materials and/or improve efficiencies.	Production processes expensive and difficult to change. Long-term improvements in environmental performance result from improvements in yield and introduction of new products.

Table 3: Types of Supply Chain Relationships

	Integrated	Competitive	Collaborative
Supply Chain Relationships	SCEM programs integrated with other ongoing initiatives.	Environmental performance seen as a non-economic criterion. SCEM managed as part of supply chain security, or used to choose suppliers.	Small number of critical suppliers that engage in joint problem solving and business development with customers.

across corporate departments such as Environment, Safety and Health (ES&H) and Purchasing, which have different expertise, objectives and measures for success.

The programs in NEETF’s study that experienced the most success in making the case for SCEM were those that built on existing priorities, selected initial targets carefully to demonstrate cost savings as well as environmental benefits and continued to sell the program as inevitable shifts occurred in budgets and motivations, targets and goals and the population of suppliers.

Given limited resources, virtually every SCEM program must thoughtfully *select targets* (environmental issues, products and/or types of suppliers) to be addressed by the program. Three typical ways of targeting programs were identified, focusing on:

- **Problem materials** used in the product itself or in production processes, often driven by “hit lists” of substances currently regulated or under public or regulatory scrutiny.
- **Widespread opportunities:** Companies with a large number of suppliers often look for targets that will improve environmental performance broadly, without a high level of interaction between the supplier and customer— implementation of environmental management systems, for example.
- **High-yield opportunities:** Some companies target the highest cost inputs or most problematic waste streams to generate rapid benefits from their programs. Others identify improvements that are simplest to put in place, thus cutting implementation costs and improving the cost-benefit ratio.

Once targets are set, companies need to *choose approaches* to address the targets. Four approaches are used extensively in a variety of operational contexts:

Companies choose targets based on circumstances particular to their business. For example, both the products and production processes of pharmaceutical companies are highly regulated, so modifications, even those beneficial to the environment, can only be made with approval of regulators. Thus, a pharmaceutical company studied added environmental specialists to teams involved in new product introductions or reformulations, a point at which modifications could be more readily considered.

- **Information gathering about the supply chain and its performance:** Companies frequently use surveys, interviews or audits to determine the supplier's compliance status, learn about its environmental management approaches and/or find out what materials it uses. This is often conducted as a baseline research step to provide information for developing and refining an SCEM program.
- **Mandates and standards:** Companies may use mandates or standards as a way to screen and qualify suppliers. They may also be incorporated into contract language for existing and new suppliers. Mandates and standards are often used to address "hit lists" of materials to be avoided or eliminated.
- **Knowledge transfer to companies in the supply chain about ways to improve environmental performance:** This approach, often complementary to the two above, involves educating suppliers about issues of concern to the customer company about which the supplier may lack familiarity or skills. Knowledge transfer may involve training suppliers in environmental awareness or specific skills, direct technical assistance to suppliers or mentoring—a longer-term commitment to work with suppliers to build their skills and knowledge.
- **Partnership with companies in the supply chain to encourage and support integrated approaches to improved environmental performance:** Where collaborative relationships with suppliers exist, this can be built upon to seek and implement solutions jointly to environmental challenges, in particular, development standards of new products and/or processes and joint projects to develop and implement alternatives to problem materials or inefficient materials uses.

Another phase in SCEM program development is **goal setting**. Companies identified several goals for their programs, the most common of which were:

- Optimizing environmental performance
- Securing a stable supply chain
- Reducing costs
- Improving quality
- Enhancing brand image
- Developing a supply chain capable of approaching the ideals of sustainability or industrial ecology

How companies **allocate resources** (including staff, management responsibility, and progress reporting) to an SCEM program has a strong bearing on how well they work. Most often, existing staff from ES&H, purchasing or quality functions are assigned to the SCEM program. However, staff from one function often lack familiarity with the basic concepts and processes of other functions. In mature SCEM programs, staff may require special training because few people have the unusual combination of environmental and purchasing knowledge and skills needed for a truly integrated SCEM program.

Some SCEM programs have support at the highest levels of management beginning in the conceptual stage; others must develop that support as results are demonstrated. Many of the SCEM programs studied began as "top-down" initiatives driven by senior management in response to the motivations described above. These managers are often in environmental functions, with the result that SCEM programs are often seen as primarily environmental initiatives and, with rare exceptions, lose direct involvement by senior managers once the program is approved. High-level support from outside the ES&H function seems to lead to high-profile SCEM programs that are implemented in an integrated fashion and are seen as worthwhile by company staff.

Companies implementing well-designed SCEM programs are willing to go to considerable lengths to find approaches that would help them meet their environmental targets. For example, after extensive work with suppliers, a clothing manufacturer found that materials to meet its environmental goals were not readily available in the marketplace. In response, it formed joint ventures with suppliers to develop and provide the materials.

A related, challenging aspect of developing a successful SCEM program is **integrating the program with core corporate objectives**. Corporate environmental functions have often been isolated from core business activities, while SCEM programs may involve multiple functions, from ES&H to purchasing, quality and manufacturing. Thus, SCEM programs are challenged to cross departmental boundaries and negotiate corporate subcultures as well as demonstrate value relative to core business objectives. Yet this daunting task appears to be key to SCEM program success. As one SCEM program leader put it, these forms of integration are key to "moving SCEM from being a project with a fairly short life to being a program with potential to add value to the company." Three strategies were reported for achieving integration:

- **Involvement of a "policy entrepreneur,"** someone with expertise, experience and relationships in their assigned function who is also willing to reach across functional boundaries to experiment with new ideas and objectives;

Key SCEM Program Challenges

Several challenges were mentioned repeatedly by SCEM program managers, including:

- Making the case to undertake SCEM requires considerable interpersonal skill, political savvy, and knowledge of company practices and cultures.
- Staff from corporate departments involved in SCEM often lack familiarity with the basic concepts and processes of other functions, thus few individuals have the unusual combination of environmental and purchasing knowledge and skills needed for a truly integrated SCEM program.
- SCEM program managers frequently are based in environmental functions, with the result that SCEM programs are seen as primarily environmental initiatives and, with rare exceptions, lose direct involvement by senior managers once the program is approved.
- SCEM programs are challenged to cross departmental boundaries and negotiate corporate subcultures as well as demonstrate value relative to core business objectives.
- Meaningful metrics are difficult to develop, but are needed to track progress and build support for the program.
- SCEM programs place demands on suppliers for information, expertise, time and participation. Suppliers may be reluctant to share information, may lack resources or may feel that providing them conflicts with other customer demands such as cost reduction.
- SCEM program development may be slow to show measurable results. Much more time is required for full program development than was previously thought.

- **Concentrated focus on cost reduction** as a way to demonstrate the business value of the program; and
- **Incorporating measures of environmental performance** explicitly into all aspects of supply chain management: contracts, purchase orders; product specifications; even job descriptions, performance goals and incentive structures.

Finally, **progress reporting** plays an important role in the success of SCEM programs. A very important indication that a program is being taken seriously is the extent to which program reporting is delivered to senior management for review. While it is widely recognized that metrics for SCEM are difficult to develop, it is just as widely believed that the effort is worthwhile, even if it does not yield metrics, because it raises important questions of goals, targeting, resources and approaches.

Other Lessons Learned

In practice, many SCEM programs are not designed in a logical, stepwise fashion. Rather, they are assembled using existing resources to address the most pressing motivations and over time, may develop into more robust, integrated programs. Some of the factors associated with successful programs include:

- **Attention to the expertise and time commitment needed from internal and supplier staff:** Once SCEM programs move beyond simple surveys, substantial participation by supplier staff may be needed. Like internal staff, supplier staff may need training or mentoring to respond to the needs of an integrated SCEM program.
- **Appropriate length of time for the program to develop and mature:** Because SCEM programs often require companies to build knowledge and relationships within the company and with suppliers, the initial stages of program development may be slow to show measurable results. Experienced SCEM program managers now see that much more time is required for full program development than was previously thought. It may take up to five years for a program seeking to replace problematic materials, for example, to move through the steps that will put alternatives in place.
- **Development of program design appropriate to company characteristics:** Many companies find it relatively easy to select appropriate targets and approaches. However, problems can arise when program elements and approaches are mismatched with the company's operations or its relationship with its suppliers. For example, technical assistance is not well suited to a large, competitive supply chain. Joint projects with suppliers may be appealing because this approach has worked well for other companies, but its success depends upon a culture of collaboration with suppliers, something that cannot be developed on cue.

Opportunities to Support SCEM

The emergence of SCEM is one of the most significant environmental management developments of the past decade, offering the opportunity to align large supply chains according to environmental and sustainability goals, provide information and technical assistance to small- and medium-sized businesses that lack the resources of large companies and monitor and measure progress. Much of this potential, however, remains untapped.

A number of organizations, including trade associations and state-based pollution prevention and technical provide direct assistance to companies in supply chains seeking to improve environmental performance. Business for Social Responsibility provides information and networking opportunities to companies seeking to work with their suppliers (see www.bsr.org/resourcecenter/index.html). The Global Environmental Management Initiative provides on-line results of a survey of SCEM practices at www.gemi.org/docs/suppliers.

Several approaches may be useful to provide additional support to the efforts of companies seeking environmental improvement throughout their supply chains:

- **Creation of on-line SCEM resource center** including links to resources case studies and opportunities for collaboration between companies implementing SCEM.
- **Continued documentation** of SCEM successes and challenges in varying company contexts, to provide guidance and share “lessons learned.”
- **Trade associations and technical assistance programs:** Leveraging organizations such as trade associations that work with industry sectors can help provide resources to companies with suppliers from those industries. Trade associations and other technical assistance organizations have important roles to play in developing and offering sector-specific information that can be used by companies in work with their suppliers and by suppliers in responding to customer goals for environmental improvement.¹
- **State-based assistance programs:** There is a growing network of state-based programs that provide assistance to customer and supplier companies implementing SCEM programs. Like trade associations, these programs could be leveraged and promoted to ensure that resources are available to companies that need them.
- **Addressing knowledge gaps of cross-functional teams:** Development of cross-training approaches between corporate departments and between suppliers and customers to address knowledge gaps. This could include traditional or web-based training; special sessions that bring together ES&H, procurement, quality and other functions and creation of networks of SCEM program managers.

Key SCEM Program Success Factors

NEETF’s study of 10 programs found that building a successful SCEM program requires a tailored approach that considers the nature of the company’s supply chain, its corporate objectives and available resources.

Key success factors seem to be **leveraging existing systems** for working with suppliers, including:

- Creating **incentives** to address environmental issues
- Using **regular progress reporting** to maintain senior management support
- Demonstrating **links to core business objectives** and
- **Designing programs thoughtfully** to select appropriate targets and approaches and address resources needs, including training for all participants, including supplier staff.

SCEM programs must be provided sufficient **resources**, including staff, training, management attention and time, to show results.

Often, building such an integrated program depends upon the knowledge and skills of “**policy entrepreneurs**”—individuals who are able to bridge disciplines and build relationships across corporate functions and with suppliers on whom the company places multiple demands.

¹ NEETF held a National Forum on the Emerging Role of Associations as Mentors on March 28, 2000 in Washington, DC to explore how industry associations support environmental improvement on the part of their members through codes of conduct and other approaches. A report on the Forum is available at www.neetf.org/pubs/index.shtm#greenbizpubs.

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