

SECTION V

Sustainable Supply Chain Management—Planning and Future Systems

CHAPTER 7

Sustainable Systems—Order Winners of the Future

More and more companies are extending their commitment to be responsible business practices to their value chains, from subsidiaries to suppliers. They do so not only because of the inherent social and environmental risks and the governance challenges the supply chain poses, but also because of the many rewards supply chain sustainability can deliver.

George Kell, Executive Director
of the United Nations Global Compact

- A study by Johnson Controls found that 96% of Generation Y respondents are highly concerned about the environment and expect that employers will take steps toward becoming more sustainable. Over 70% of respondents want business to make a real commitment to sustainability.¹
- On a quarterly basis, managers at DHL assess the impact of future scenarios and evaluate the opportunities and risks in their departments. The management process is used to assess environmental management risk. DHL services include reports on the carbon emissions arising from products and services used by their customers, and assessment of a customer's carbon footprint. Global Forwarding Freight also offers a "Carbon Dashboard." In addition to reports on carbon emissions, the dashboard simulates alternative supply chains combined with a carbon efficiency analysis.
- Based on information from 2,415 companies, including 2,363 suppliers and 52 major purchasing organizations who are CDP Supply Chain program members, 70% of companies believe

that climate change has the potential to affect their revenue significantly, a risk which is intensified by a chasm between the sustainable business practices of multinational corporations and their suppliers. These members include Dell, L'Oreal, and Walmart and represent a combined spending power of around US\$1 trillion. The research marks CDP's most comprehensive annual update on the impact of climate change on corporate supply chains.²

- Ford Motor Company hires climate scientists to be part of their planning process and integration of sustainability into decision making. Setting a scenario limit on carbon emissions at 450 parts per million (ppm), Fords' management makes product development and supply chain decisions while considering future scenario planning and this self-imposed limit.
- The new US workforce increasingly comprises individuals who seek the opportunity to make a contribution to society, and who are choosing jobs that enable them to make this a part of their lives. Case in point, 92% of Millennials say they want to work for environmentally conscious firms,³ and over 90% of Millennials say that a company's success should be measured by more than profit, and over 50% say they think businesses will have a greater impact than any other societal segment—including government—on solving the world's biggest challenges.⁴

The vignettes we use at the start of each chapter highlight leading companies involved in SSCM, risks of not being prepared for this business paradigm, and already apparent trends. The examples used in this chapter highlight a number of important facts motivating the need for any organization to cross the chasm and implement the concepts and practices outlined in this book. Why? Because your employees want to be involved in sustainable business practices, leading firms are already integrating sustainability into risk management and even hiring climate scientists so they can be part of teams involved in strategic planning activities, and while we implicitly allow existing systems to be wasteful we now recognize GHG emissions and carbon as a measure of this waste knowing that it has a monetary value. Finally, we will need both and

internal and external approach to engaging stakeholders for the successful implementation of SSCM.

The overarching goal of this book is to help you better understand sustainable supply chain management. In doing so, we want you to see your own organization through the lens of sustainability, find intersection opportunities, leverage existing management systems, and evaluate new ways to create value for your organization and supply chain. In this chapter, we take an integrative and forward-looking approach to SSCM with the following objectives.

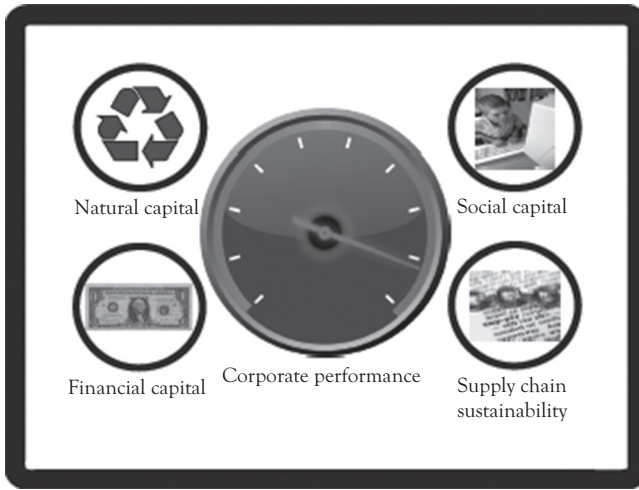
Objectives

1. Provide a structured approach to planning and implementation.
2. Review the self-assessment process.
3. Review the foundations of SSCM (a synthesis of prior chapters).
4. Enable action learning and an applied approach to using the information in this book.

Ford Motor Company

We have asked managers within different industries to relate a story of how their firm changed its strategy using sustainability to guide that change process. While many firms understand the importance of planning for the future we next want to highlight one of them. According to the management at Ford, one of the big enablers of product strategy transformation from a sustainability standpoint was CO₂ emissions. If you look at the carbon footprint of Ford, you have the vehicles they produce and customers use, manufacturing facilities, suppliers facilities, and dealerships. When reviewing the firm's carbon footprint, and these elements up and down the supply chain, you find that 98% of Ford's footprint comes from their products in use. Thus, the biggest impact Ford can have is to increase fuel economy and as result, reduce GHG emissions.

A turning point for Ford was found in the 2007 International Panel on Climate Change (IPCC) report and the impact of climate change, temperature increases, and the tracking of ppm of CO₂. Using this report as a catalyst, the leadership at Ford now have climate scientists employed



Sustainability dashboard

Figure 7.1. Dashboards of the future.

within the company and has publicly acknowledged climate change is real. These scientists have come up with an internal glide path targeting a global 450 ppm threshold. While the targeted number of 450 is debatable as being too high, the fact that CO₂ and science are shaping design and strategy decisions is not. The algorithm used helps management to understand their global CO₂ targets for any year in the future. You can name the year and management can tell you what their CO₂ targets are, and their business unit's share of allowable CO₂. Ford's decision makers are enamored with this because it provides them with a stable set of guidelines per year that do not change. This way, they know what their fleet and product development should look like one year from now, five years from now, or ten years from now. How did this come about? Starting in 2007 and 2008, Ford's management teams actually went out and worked with environmental groups, the Union of Concerned Scientists, Environmental Defense Fund, and others. What they gleaned from these stakeholders is that the most important thing is to get started with an approach to sustainability indicatives based on data and performance metrics such as CO₂.

Why is CO₂ so important? First, it is an indication of waste as was reviewed in Chapters 2 and 3. Second, consider that China is implementing

a pilot carbon trading platform. This recognition of emissions as having a price associated with them is substantial given China is the manufacturer to the world and has been the largest emitter of CO₂ in absolute terms for the past few years. Simultaneously, California has launched a carbon trading platform where current prices are around \$15 a ton. Carbon may be the first environmental waste to have a price in most of the major economies of the world, and CO₂ certainly will not be the last. Carbon markets are now planned for or operating in EU, Korea, and Australia where prices are around \$23 a ton, and the United States. Consequences of measuring GHG emissions with a focus on CO₂ include driving manufacturing back into countries where it was previously outsourced and the development of distributed manufacturing systems within countries to minimize supply chain distances traveled simultaneously lowering GHG emissions.

Introduction

Motivation for the information presented in this book is a call for a better understanding of sustainable supply chain management and the successful implementation of new programs. As defined early in this book, SSCM is the integration of systems thinking and action into supply chain management that must include financial, AND environmental, AND social performance. These SSCM practices include stakeholder engagement, product/process design, LCA, materials selection and sourcing, manufacturing processes, waste, transportation of final products and services to consumers as well as end-of-life management of products and closed-loop systems. Systems thinking brings with it a more comprehensive approach to analysis that focuses on the way that a system's constituent parts interrelate and how systems work over time.⁵ This definition of SSCM is positioned within the context of business models, frameworks, and tools for selecting and developing operations and supply chain management practices. While supply chain management calls for assessing and using information to make long-term decisions regarding supply chain strategy, having a strategy is not enough. Key to any successful strategy is the need to integrate suppliers and important metrics into processes management. Information in this chapter deals with how firms

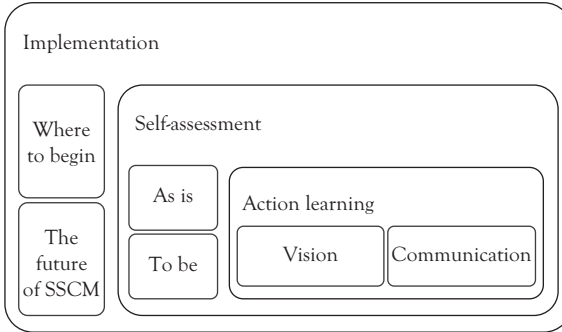


Figure 7.2. *Planning and implementation architecture.*

should implement SSCM. To integrate this paradigm into the long-term planning processes of a firm, we will next address implementation practices (see Figure 7.2) such as self-assessment, education, integration, vision, and communication, as they are all important for developing and delivering a SSCM strategy.

The Future of SSCM

Before addressing what we see as the future of the sustainable supply chain, it is important that we return to the discussion of the various types of sustainability strategies introduced in Chapter 2. In this discussion, we pointed out that sustainability can be implemented in one of three major forms:

- **Sustainability as Public Relations:** This is an opportunistic approach—one in which the firm is not really committed to sustainability. Rather, it looks to any actions that it takes and sees if there is sustainability “angle” that can be publicized. Simply put, this is spin management with a sustainability perspective.
- **Sustainability as Cost Minimization:** With this approach, management focuses on the waste aspects of sustainability. Pollution, one of the major undesired outputs found in systems that are not sustainable, can be regarded as a form of waste. Waste adds significantly more to costs than it does to revenue. Consequently, drawing on the various tools and procedures offered by Lean, the

firm strives to reduce waste and ultimately cost by focusing on sustainability. While very attractive in the short term, we must ultimately recognize that the long-term attractiveness of this approach is limited. Diminishing marginal returns plays a role. Over time, we find ourselves spending more and more time, efforts, and resources on smaller and smaller returns.

- Sustainability as Value Maximization: Here, we see sustainability as linked to the firm's strategy and as an integral element of its business model. With this approach, the firm is committed to sustainability because it enables the firm to offer more value to its key customers. The result is often higher revenues, not simply lower costs. Higher revenues, associated with market growth, are very attractive pulls for upper management.

As we move into the future, the first critical finding is that "sustainability as Public Relations" will become less viable. This prediction has a very high probability of taking place. First of all, customers are becoming far more knowledgeable, educated, and critical when it comes to sustainability. Smart phone apps such as GoodGuide (goodguide.com), or web sites such as sourcemap.com provide a wealth of transparency and visibility like never before. They can look up companies and their activities and can read what others have written about these companies. Unless they see a viable, well-thought out strategy underlying the sustainability announcements, customers are likely to dismiss these claims.

This factor was recently driven home to one of the authors, who were asked to do a sustainability presentation for a major company located in the Midwest. In preparing for this presentation, the author decided to select certain companies who he viewed as exemplar in terms of sustainability reporting. One of the firms selected was Unilever; the other was an internationally known manufacturer and distributor of liquid beverages. In presenting the various reports generated by this latter company, the author was challenged by one of the participants. The participant remarked that the statistics and the presentations provided by this company were really defensive in nature. After all, the participant argued, this company was primarily selling sugared water, which was adversely affecting health worldwide. The reports did not address this problem; rather,

they seemed to argue that any adverse health issues should be weighed in terms of the other benefits that this company was creating. To this participant, this was simply window dressing and it should be dismissed. What was interesting was that this position was shared with other participants. To these participants, what they saw was sustainability as public relations and they rejected this position.

The second factor is that of the “CNN effect.” The CNN effect is a notion that is frequently heard by researchers and writers working in the humanitarian/disaster relief area. What this means is that in today’s world, the media is no longer willing to accept any claims made by firms. Rather, every claim will be investigated and, if found to be false or unsupported, the negative results will be communicated quickly through print, television, on the radio and over the Internet. In other words, when a firm screws up on sustainability, it is immediately evident to the rest of the world thanks to a demanding and intelligent press/media. Apple has experienced this effect first hand as have other companies such as Nike and the Body Shop.

The second critical finding is that we can expect to see sustainability and sustainable supply chain management as continuing to expand and drive business value. That is, we expect to see more and more firms integrating sustainability into their business strategies and, more importantly, into their business models. Why? There are several reasons for this shift.

First, firms such as Ford, IBM, Unilever, Walmart, and other innovators and early adopters have already provided the proving grounds for proof of more efficient and effective value creation. For a synopsis of studies showing the business case for sustainability see “Sustainability Pays,” a project by Natural Capitalism Solutions.⁶ Consequently, the risks of being a first mover (i.e., moving first and picking a development that ultimately does not succeed, e.g., picking Betamax over VHS in the tape wars) have been significantly reduced by the efforts of these companies. Second, customers are now increasingly expecting sustainability as part of the value proposition. Third, if we want to maintain our competitive positions in the marketplace, we are now expected to respond by matching the major sustainability-based moves initiated by our competition.

Additionally, the various forces impacting SSCM are long term, persistent, and significant. These forces are due to resources (resource scarcity and

increased competition), customer demand, government (especially in the developing countries—as many want what they see in North America and Europe), and transparency. In the current and future business environments, sustainability must be seriously considered. When effectively used, it can become an order winner; when poorly deployed or overlooked, it will be an order loser (as discussed in Chapter 2).

Will everyone become sustainable? The answer is no! In reflecting on this question we return to the importance of systems design and the Crossing the Chasm model. Some firms are innovators and early adopters while others are laggards; yet the majority of organizations fall somewhere in between. Some have already said that sustainability has neared a tipping point.⁷ How we will respond to the sustainability challenge depends on the type of managers we are and the type of firms in which we operate. A key aspect of this is organizational culture and the ability of management to implement new business paradigms.

Will I succeed? Not necessarily! But by understanding current processes and trying at least, you increase your chance for success. Remember—not trying = 0 chance for success. The information outlined in this book provides guidelines, frameworks, performance metrics, and standards that increase the probability of a successful outcome. Sure, you can take a narrowly focused approach to SSCM, define it, and maybe do just enough to be able to market some of your actions. To do so comes with a reality check from the point of view of your competition and stakeholders. Deming's admonition, made for TQM, equally applies to the SSCM. He was once approached by a CEO who asked if he, the CEO, had to do everything that Deming had identified as being important and necessary. "No," Deming replied. "You don't have to do everything. Survival, after all, is not mandatory."

Planning and Implementation

If we are to be successful with sustainability, it must become part of our day-to-day life, business model, our core values, and those of our supply chain. It must become part of our strategy and our corporate culture. This is a major challenge and it is one that we must recognize. Although strategic planning is entrenched deeply in the minds of corporate managers and

market planners, SSCM will need to be diffused throughout the organization and across functions. Before SSCM can truly affect long-range decisions at the corporate level, decision makers must first understand, develop, and implement strategic planning more effectively at the department level. The corporate planning process must incorporate more effective integrative and coordinating mechanisms among the various components of the strategic planning process. The end result must ultimately enhance a firm's ability to create value.

Any manager typically can see only part of the picture when looking at a supply chain. A few decades ago, researchers found purchasing personnel, especially at higher levels, do not spend a sufficient amount of time and energy on such important strategic activities as external monitoring.⁸ Unfortunately, this is still true in some late adopting and laggard firms today. Unless high-level personnel concentrate to a greater degree on these external relationships they will not be able to have a positive impact on a firm's strategic planning process.

We are now more aware of the social/cultural side of change and of the organization. What we have yet to address is the issue of culture and implementation. Through decades of empirical research, researchers have established numerous relationships between organizational culture and performance. Organizational cultures (i.e., collaborative, competitive, creative, and controlling to name a few) will have different approaches to structure their solutions and thus account for the important role that culture plays in the planning and implementation of new initiatives. Next, we will use action learning as one applied approach to tackling the implementation process.

Action Learning

There is a growing need to unlock the capacity for all personnel to contribute to problem solving. One means of identifying and integrating sustainable supply chain practices is through action learning. This applied approach to problem solving and learning is defined as "a personal and organizational developmental approach applied in a team setting that seeks to generate learning from human interaction arising from engagement in the solution of real-time (not simulated) work problems."⁹ We

know from previous chapters that teams are important to the success of any initiative, yet we all have the same question at the beginning of a new initiative.

How do you begin this journey? First, begin by understanding why you want to become sustainable. Do not blindly jump into SSCM thinking everyone will understand or see this opportunity the same way you do. It has taken over forty years for the environmental movement to get to where it is today. Your efforts should be purposeful and focused. Understand what you want out of sustainability and why you are pursuing this initiative (e.g., efficiency, waste reduction, revenue, risk reduction, flexibility, brand image).

Second, create a compelling argument for change. Understand that people in your organization are being asked to undertake change almost every day. They have been asked to undertake the TQM journey, implement Lean Systems, become more innovative, and to transform their business relationships from being transactional to being collaborative. Your call for sustainability is simply another demand being added to the pile of demands. This situation is not simply good or bad; it is simply business reality. Because countless demands have failed in the past or have been replaced by the new “management revolution of the month,” many organizational members have adopted a very simple but effective approach—nod your head as if you understand, listen politely, and then keep doing what you are currently doing that works.

If we are to overcome this management inertia, we must first build a compelling business case. There are two aspects to this business case that must be emphasized. The first and one that most people focus on is to provide a quantitative assessment of costs and benefits that demonstrates the significant advantage offered by sustainability. Yet, you have to do the second part—to demonstrate to the participants that what is currently being done no longer works. We have to effectively discredit the current practices. Unless we do this, people will simply return to what they used in the past. Better the devil that you know rather than the devil that you don’t know.

In developing this business case, education and understanding will be key to this undertaking. Start with an understanding of the “As Is” state of your current operations and supply chain practices. Apply known

process-mapping approaches, standards, and make sure you have the necessary tools as outlined in Chapters 4. Secure top management support and make sure you have the time, resources, and commitment necessary. An audit of current practices and self-assessment will be just the start of the implementation process. With an understanding of current operations and supply chain practices, you can then start making decisions regarding how you will lead your given organization on the implementation of SSCM based on evidence and opportunity identification.

Assessment at the Macro and Corporate Levels

This book argues that the stage has been set for the extension of environmental management to SSCM within many original equipment manufacturers and transportation providers already driving new forms of business value. Have we gone far enough? The answer, not yet. To truly begin addressing this challenge, we need to assess events and performance at both the macro level (fit with strategy level) and the micro (performance within the firm level) level.

Self-assessment at the Strategic Level

One way to assess how far we have to go would be Hart's Sustainability Portfolio tool found within the Harvard Business Review article, "Beyond Greening" can provide insight as to how far we still need to go to reach tomorrow's potential (Figure 7.3). This tool can help you determine whether your current strategy is consistent with sustainability. This process involves a macro-level self-assessment AND rating of your organization's capability in each of the four quadrants by answering the questions within each. Modern portfolio theory would suggest business managers can construct this portfolio to maximize expected returns given the level of risk and Hart suggests a balanced approach to maximizing returns.

- Many organizations will find themselves primarily in the lower left quadrant, with an emphasis on pollution prevention. Without investments in new technologies, core capabilities, and new markets, the company's environmental strategy will be vulnerable to market forces in the future.

	Internal	External
Tomorrow	Clean technology Is the sustainability of our products limited by our existing core capabilities? Is there potential to realize major improvements through new disruptive technology?	Sustainability vision Does our corporate vision direct us toward the solution of social and environmental problems? Does our vision guide the development of new technologies, markets, products, and processes for new critical customers?
Today	Pollution prevention Where are the most significant waste and emission streams from our current operations? Can we lower cost and risk by eliminating waste at the source or by using it as a useful input?	Product stewardship What are the implications for product design and development if we assume responsibility for a product's entire life cycle? Can we change our value proposition (add value or lower costs) while simultaneously reducing the impact of our products?

Figure 7.3. The sustainability portfolio

Source: Adopted from Hart (1997).

- A portfolio with high scores in the top half can be construed as a vision without the capabilities to implement it. Internal strengths are indicative of innovation, while external strengths are aligned for anticipating new markets and sustainable development.
- A portfolio with higher scores in the left half represents an ability to address environmental issues through internal process efficiency and new technology. A focus on today is efficient but will miss out on the innovation of tomorrow.
- A portfolio with higher scores in the right half can overlook facility-level operations, core capabilities, and technology as operations will be causing more environmental and social impact than is necessary. A focus on today can be construed as a right to operate aligned with industrial ecology.

Hart's macro level assessment is a good place to start when wanting to understand the larger picture and potential vision of SSCM.

There is now a new opportunity to look at the primary enablers of a value chain, this being the transportation industry's financial, AND environmental, AND social value maximization. Why the transportation industry? New evidence has shown that over 80% of this economic

sector's ecological footprint is captured within direct carbon emissions and purchased energy inputs.¹⁰ With new information at now available to them, firms across industries are starting to research the life cycle implications of their products and services that include transportation, and the use of products. Decision makers in those sectors should also think about the implications of measuring and managing their supply chain's SVA. Why? Total supply chain emissions consist of the majority of a manufacturing firm's carbon footprint,¹¹ which has typically only been looked at as a cost of doing business. This is only one measure of supply chain performance. In the near future, performance will include multiple measures of financial, AND environmental AND social performance taking firms beyond pollution prevention and into the realms of clean technology, product stewardship, and a sustainability vision.

Self-assessment at the Corporate Level

Assessment at a micro level enables understanding of business processes and elements of your business model (capabilities, key customer, and value proposition). We suggest internal assessment of your own function first. Start with a narrow scope or processes to assess. With an understanding of how you would approach this process from a single functional perspective, then move toward cross-functional involvement through the assembly of a team. This assessment process, when part of action learning, is best facilitated with the help of a cross-functional team. The audit and assessment process (for a single function or across functions) should have the goal of understanding:

- Performance metrics currently in use, assessment of pollution prevention
- Best practices and integrated management systems
- Interrelationships of processes and systems as a whole
- GHG emission inventory and carbon footprint
- Sustainable Value Added
- Integration and design opportunities
- New goals and metrics relative to sustainability opportunities and standards

- Vision of the “To Be” state (carbon neutrality, zero emissions) and a sustainability vision
- Integration into the day-to-day life of the firm

Approach the self-assessment, opportunity identification, and change management through the use of Juran’s UBS reviewed in Chapter 6. As we know, Juran developed a systematic approach to TQM. The goal, in developing this approach, was to make quality into a habit. For quality to become a habit, it had to be the result of a repeatable process. This UBS process logic applies equally well to sustainability as a focal point as it applies to the proven benefits of TQM. The steps in this UBS process are within a context of self-assessment and proven practices including:

1. Proof of the need
2. Project Identification
3. Organization to guide each project
4. Diagnosis—breakthrough in knowledge
5. Remedial action on the findings
6. Breakthrough in cultural resistance
7. Control at the new level

Outcomes of the self-assessment allow a team of internal managers to learn more about SSCM impacts across functions and its potential within the organization. Teams need to select and implement the most cost-effective technologies and practices. There is one caveat to the assessment. To help ensure a better outcome, assemble the team and perform the assessment without adding more responsibilities to team members’ existing workloads. Thus, find a balance with the new initiative and lessening of prior responsibilities. We can all find some less valuable responsibilities we would like to get rid of, now is your chance.

Action Items and Audit Questions

One outcome for the assessment team should always be to educate others as to the meaning of, and opportunities for SSCM. One purposeful

approach to educating yourself and others is found within the end of chapter AI and AQ. Each chapter in this book synthesizes information from the field and provides the reader with actionable insight for continuous improvement. AIs and AQs at the end of each chapter will help to identify and prioritize opportunities for action learning and organizational improvement.

Have the assessment team provide independent assessment from their own functional perspective as to what is important and why. Use our on-line assessment AQs to provide summary information of your assessment and within-industry comparisons as this is available to you at no cost. When the team has results, share the insight within the team and then widely within the organization. Create a sense of urgency and work toward quick wins where the results of the initiative(s) can be shared across functions.

Top Management Support

Support from the top is the key to any initiative. The need for SSCM project is recognized by everyone in the organization when it is evident that this initiative is being driven by top management's desire to improve the firm's competitive position or as a top management response to specific threats to the firm. In some cases, top management will initiate the program directly. In other cases, ad hoc groups already working on supplier issues initiate the need for a program. The recognition of the need for an initiative is then transformed into a set of organizational and sustainable objectives. These objectives can include the hiring of new talent from top MBA programs who are signatories to the United Nations Principles for Responsible Management Education (PRME), ranked by the Aspen Institute's Beyond Grey Pinstripes or the Corporate Knights Global Green MBA ranking of graduate business programs integrating sustainability within curriculum or highlighted in the Princeton Review's guide to green colleges. Objectives should be broad-based and flexible while balancing the ability of personnel to try new things and fail without retaliation. A culture of innovation cannot come about through a fear of failure. Finally, top management can make the UBS better established as the approach to SSCM opportunity identification and execution as part of internal reward and incentive systems.

Vision and Goals

A vision and goals should be the objective of the assessment team, including the steps and suppliers to include in this change process. A difficulty in doing this comes from how people in different parts of the organization talk about initiatives. Top management tends to focus on the bottom line while line workers talk about materials and resources. Thus, a vision helps to get people focused on the “To Be” state of the future. To this end, the opening chapter of the book *Natural Capitalism*¹² begins with:

Imagine for a moment a world where cities have become peaceful and serene because cars and buses are whisper quiet, vehicles exhaust only water vapor, and parks and greenways have replaced unneeded urban freeways. OPEC has ceased to function because the price of oil has fallen to five dollars a barrel, but there are few buyers for it because cheaper and better ways now exist to get the services people once turned to oil to provide.

The authors go on to talk about buildings that generate more electricity than they consume, atmospheric CO₂ levels decreasing for the first time in 200 years, water leaving facilities being cleaner than when it entered, and industrialized countries reducing resource consumption by 80% while improving the quality of life. This is only part of the first paragraph, yet it provides a vivid vision of the future and through backcasting (application of The Natural Step) from that vision to where we are today, it also provides an opportunity for decision makers to pause and think about how business processes and whole supply chains will have an impact on the Natural Capitalism vision.

With the help of top management, and the results of the assessment team’s findings, the vision should be communicated widely, and aligned with training and resource allocation to make the initiative successful. The shared vision and performance metrics will bring the supply chain together as stakeholders will want to know how to create value while aligning processes and practices with the vision.

Sustainability is part of a mixed bag of outcomes...innovation, waste reduction, culture, visibility, value creation, and transparency across a

supply chain. It is imperative to understand how it aligns with other systems and outcomes the organization is pursuing.

Three additional points must be reinforced before we leave this discussion of how to implement SSCM. First, involve your supply chain but do not expect the supply chain to believe that you are committed to sustainability until they see significant, verifiable evidence of progress within your organization. Second, when undertaking change, first allow your people the opportunity to state their reservations and concerns. A great deal of organizational resistance to change is due to the fact that the people have valid concerns that they feel they are being ignored. Listen, understand, and work with the people to deal with these concerns. Third, develop and maintain a sense of urgency. Often, these initiatives die because the people involved do not see them as being of high priority. Develop a timeline for change; identify and monitor milestones and progress; hold people accountable for results; report the good and the bad results; and be prepared to revise objectives and project timelines as events change. Develop and maintain an on-going pressure for change—a message that should be consistently delivered at all level of the organizations, beginning with the CEO. To this end, it is useful to look at what Paul Polman at Unilever has done—his timeline is a template that many firms should strive to emulate.

Foundations of Successful SSCM

Supply chain strategies and practices have evolved from a typically non-competitive, overlooked element of strategy before the 1980s, to a synergistic and integral part of corporate competitive advantage today. For firms who are considered to be innovators and early adopters, there are many challenges and hidden opportunities to recognizing and integrating SSCM. We know that suppliers are critical to the competitive success of firms. The fact that future supplier performance is expected to continuously improve and involve new attributes of performance adds to the complexity of the function and the importance of the supply chain management professional. These decision makers will need to understand several foundational elements of SSCM to then be able to leverage these elements internally and externally, when working with their supply chain.

Table 7.1. Foundations of Sustainable Supply Chain Management

- Focus on the 3Ps – product/process/packaging
- Prevention is preferred to correction
- Sustainability must be integrated into the day-to-day life of the firm
- Sustainability must be captured within strategic, tactical, & operational performance
- Sustainability is a system opportunity
- Sustainability must be linked to the strategy and the bottom line
- Waste is a symptom, not the root cause
- Waste is ultimately linked to processes
- Waste elimination and management is economically driven

Sustainability as a system's approach is built on a number of premises (Table 7.1), as summarized in Chapter 1. Systems thinking is an important part of this approach while understanding that each element contributes to the creation of value and success of larger systems such as a supply chain. These foundational elements include the following:

Recognition of these elements is an important first step in seeing your business system as a whole. To do this, attention should next turn to integrative models.

Understand Your Business Model

The business model is highly integrative bringing together the three elements of the key customer, the value proposition, and capabilities. As we know, capabilities, while important, are not enough by themselves. As capabilities change due to technological innovation, new tools, capital investments, and process improvements, these changes have to be evaluated in terms of how they affect the other two dimensions. If the firm targets sustainability initiatives as a way to attract a new key customer, it must reevaluate the appropriateness of the current value proposition and capabilities. The highest level of value is delivered when key customer expectations (recognized as order winners, and order losers, order qualifiers) are addressed by the value proposition and delivered by the capabilities of the firm.

Transparency

This is most notable through the broad expansion of corporate reporting. Sustainability reporting is the practice of measuring, disclosing, and being

accountable to internal and external stakeholders for organizational performance toward the goal of sustainable development. Emerging companies like icix (www.icix.com) convene collaborative commerce networks allowing you to share information with your business partners and supply chain via the cloud.¹³ They have 200 databases within their network and have plans to assess over 30,000 suppliers on sustainability and water use while also tracking dozens of interrelated performance indices.

Sustainability reporting describes the reporting of economic, environmental, and social impacts (e.g., an integrated bottom line, corporate responsibility reporting, etc.).¹⁴ A sustainability report should provide a balanced and reasonable representation of the sustainability performance of a reporting organization—including both positive and negative outcomes. To this end, we see the need for decision makers to view **value creation** in a new way. In chapter 2, we proposed building on the concepts of economic value added and total cost of ownership to now start assessment of sustainable value added. This will not be easy, but is a trend in the movement toward corporate reporting of an integrated bottom line.

Sustainable Value Added = Level of Financial, AND Environmental AND Social Value Generated – Total Waste

Performance Metrics

Metrics are important to measure, monitor, and manage toward continuous improvement. Of the many types of metrics in Chapter 3, predictive metrics increase your chance of achieving a certain objective or goal in the future. Predictive metrics are associated with aspects of the process that are thought to affect the outcomes of interest. Predictive metrics are appropriate when the interest is in preventing the occurrence of problems, rather than correcting them.

Standards

Standards play an important role in a sustainable supply chain and can be used to achieve a number of important outcomes. These outcomes include financial, AND environmental, AND social performance. As such,

standards should be leveraged for their alignment with a given business model and used carefully. There are a large (and ever growing) number of standards appropriate to sustainability along with a process for the appropriate usage and implementation of standards with over 30 of the most used standards outlined in chapter 4.

A Management Toolkit

Tools enable decision makers to better assess processes and understand whole systems. The tools outlined in Chapter 4 focus on process flow analysis, major quality management tools, the PDCA cycle, and the opportunity to leverage multi-criteria decision analysis to help assess new initiatives that do not have all the quantitative data you would like and can accommodate both qualitative and quantitative assessments of options involving more than one criterion of performance.

Designing Products and Processes

Design for Sustainability and design thinking approach to any product or process refers to the methods and processes for investigating ill-defined problems, acquiring information, analyzing, and positing solutions early in the design and planning process. As described in Chapter 5, this design approach is a perfect fit for proactively minimizing waste and impacts of processes on larger systems. With this insight, managers can focus on the way that a system's parts interrelate and how systems work within the context of larger systems (also called systems thinking). If we design products, processes, packaging, or service with the objective of eliminating waste within systems, we will be well on our way to SSCM.

Life Cycle Assessment (LCA)

This technique is used to assess the environmental aspects and potential impacts associated with a product, process, packaging, or service. LCA is also a tool enabling DfS. There are numerous software packages and LCA tools available to help get started. The overall approach will involve first developing the goal, scope, and bounds of the assessment. The steps

involved include (a) compiling an inventory of relevant energy and material inputs and environmental releases; (b) evaluating the potential environmental impacts associated with identified inputs and releases; and finally, (c) interpreting the results to help you make a more informed decision as to product, process, or packaging modifications. The interpretation of results should inform the decision-making process to lessen environmental impacts and associated costs. If you do not take this type of information into account, someone else may end up providing an LCA of your product on a website such as Sourcemap.com where transparency is taken to a new level.

Supply Chain Integration

Integration is critical to the success of any sustainability initiative. Recent findings from MIT Sloan and the Boston Consulting group find “Sustainability-driven Innovators do not treat sustainability as a stand-alone function detached from the business. They integrate their efforts into operations and planning.”¹⁵ Integration occurs at various levels: legal, processes, data, systems, information flows, and the extent to which the participants invest in each other’s systems. Integration ideally is found at the level of parties working closely together to ensure that their actions and flows are continuously synchronized. Integration is important because it influences visibility, the ease of information sharing, and the resulting supply chain relationship. This integration, visibility, and now its extension to traceability continue to grow in importance as organizations such as the United Nations Global Compact, with a task force of industry partners, are developing systems for tracing product and raw materials through complex global supply chains.

One example of how transportation firms are coping with supplier integration and performance can be found within DHL, where subcontracted transportation accounts for most of the DHL Group’s carbon emissions. Because of this, DHL has made managing subcontractors a key component of environmental protection programs. Determining the carbon performance of third-party transport providers is difficult and they have joined forces with Beiersdorf, Heineken, IKEA, La Poste, Procter & Gamble, TNT, UPS, as well as other international companies to found the Green Freight Europe initiative.¹⁶ The goal is to increase transparency

in the road freight segment by setting up a standardized system for collecting and reporting CO₂ emissions from road freight transport. The aim is to get all companies along the supply chain involved in the green procurement of transport services by offering improved transparency and comparability for carbon efficiency.

As we review the foundations of SSCM, they provide a road map for both short-term and long-term implementation opportunities for any organization. Next, we review how you will know when efforts can be deemed successful?

Measures of Success

Field research involving sustainability professionals within several large multinational corporations can be found within Chapters 6 as we reveal insight as to how they operationalized sustainability and work with supply chain managers. Their primary focus is on performance measurement, external rankings, and sustainability reporting.¹⁷ When discussing the importance of measurement, participants highlighted setting goals and KPIs as the most important enablers of understanding if operations and processes are progressing toward sustainability goals. As was mentioned by these professionals numerous times, sustainability should be everyone's responsibility and demonstration of this can be found in meeting and exceeding goals while tracking KPIs. What makes new initiatives successful is a combination of leadership, short-term and long-term projects, a road map, and compensation tied to performance of environmental and social initiatives. The most frequently noted metrics discussed by those interviewed include:

1. Energy efficiency
2. GHG emissions
3. Water consumption
4. Solid waste
5. Product attributes
6. Environmental exposure
7. Benchmarking external indices annually
8. Carbon indexed to products and revenue

Rankings are currently leveraged by sustainability professionals to validate practices and demonstrate programs going beyond compliance. The three primary rankings or indices highlighted in order of frequency are: Newsweek, the CDP, and the Dow Jones Sustainability Index. If your firm is included in these rankings, you are already considered to be among the innovators and early adopters of sustainability practices and you are already producing a corporate sustainability report.

The GRI is highlighted as the leading approach to measuring and disclosing information within corporate reports. Other important highlights include the use of integration of financial, environmental, and social reporting of performance, and the ISO certification also demonstrating assurance of performance within known standards.

If you think reporting is not yet a big deal consider the following: The GRI, Global Initiative for Sustainability Ratings (GISR), and the International Integrated Reporting Council (IIRC) have combined efforts to create a collaborative framework for integrated reporting and the convergence of financial and Environmental Social and Governance (ESG) information. These organizations are now supported by B Lab's, the Sustainability Accounting Standards Board (SASB) efforts, and Forum for the Futures Sustainable Business Model Group. Within the next few years, there will be a unified set of material criteria to rate and rank a firm's progress toward being a sustainable organization relative to its peers.

The trends of integration and transparency are supported by surveys and empirical evidence.¹⁸ Consider what is already happening in other regions of the global marketplace: The Hong Kong stock exchange is now making ESG disclosure a best practice. Integrated reporting is now mandatory by the Johannesburg Stock Exchange and the King III Code of Corporate Governance in South Africa as they now have one of the highest reporting ratios of carbon accounting and integrated reporting.

Develop a Culture of Sustainability

Whether or not you are successful with developing and maintaining sustainable supply chain management depends to large extent on whether the people in the organization accept and believe in sustainability initiatives. In many cases, this means making sustainability part of the corporate culture.

Organizations affect how their members see issues, deal with problems, and identify what is important. People are influenced by organizational goals, structure, training, coworkers attitudes, successes and failures, and a host of other aspects of organizational life. Operational programs such as those we have discussed in this book can have large impacts on organizational culture, and different cultures may be more or less appropriate for a given set of goals. For example, the organizational culture that evolves over time in a lean system emphasizes waste and variance reduction, along with process standardization and discipline. Such an approach may seem stifling to employees that are rewarded for radical innovations. In this way, operational initiatives can greatly affect the culture and work life of employees. Managers must often address conflicts between changing organizational goals and existing cultural norms. In fact, pre-existing cultural norms often form serious impediments to organizational change. This is why in environments of rapid change, operations managers have to be so attuned to the strengths and weaknesses of their organization's culture. These strengths and weaknesses are often difficult to identify. As one manager put it, "organizational culture is what the employees do when the boss is not around."

While culture can be difficult to change, it can also be a key source of competitive advantage. For example, consider the success of Apple. Many people believe that the reason that Apple has been successful is because it has developed a culture of innovation.

Organizational culture is an increasingly important issue as operations managers seek to integrate partners in the supply chain. Culture affects supply-chain-related issues like trust and compliance. In general, the people in an organization work most comfortably with others who they perceive to be like them. They tend to have less trust when dealing with people who are perceived to have different goals or motivations. For this reason, managers have to carefully consider differences in the organizational cultures of potential partners, and reassess current partners before they enter into long-term collaborative agreements.

Organizational culture plays a critical role in achieving sustainability goals. People within the organization must embrace and support the organization's view of sustainability in order for goals to be met. This is not always easy. There is disagreement and controversy surrounding some

sustainability issues (global warming, for example). Leadership plays an important role in defining the culture and related sustainability goals. For example, Herman Miller of Zeeland, Michigan (a furniture company), has had extensive success with sustainability. One of the founders of Herman Miller believed strongly in corporate stewardship and responsibility. In large part, the company's commitment to sustainability stems from the values and corporate culture created by this founding leader.

Consequently, to succeed with sustainability in the long term, sustainability must not be something that is discussed in annual reports or something that is pointed out to visiting governmental official. Rather, sustainability must become part of the organizational culture. It must become something that the employees do when the boss is not around.

Benefits of Sustainable Supply Chain Management Practices

The benefits of sustainable supply management form the fundamental reason for undertaking the sustainability challenge and the next industrial revolution. It is not surprising that benefits include both direct and indirect financial benefits. The most commonly found benefits include: (a) a reduction of costs, including a product's whole life costs and the organization's overall operating costs; (b) increased competitive advantage; (c) increased profits; (d) decreased damage to the environment and human health, (e) increased levels of innovation, (f) the potential to gain new customer market segments, and (g) risk mitigation.

Understand that sustainability is an issue of managing perceptions of trade-offs. We know from Chapter 1 and Accenture that firms can simultaneously improve sustainability, AND cost effectiveness, AND service quality.¹⁹ Once we leave the low-hanging fruit, we have to identify and deal with progressively more difficult decisions. The nice thing about low hanging fruit is that due to changes in technology and innovation, it keeps growing back.²⁰

Transforming the supply chain business model is the corporate strategy of the future. Because much of your firm's impacts are likely to be in your supply chain, it makes sense to integrate the supply chain as early as possible. Today, large companies, including 85% of the global 250, have

or are developing sustainability reports with specific goals and targets. Many even have holistic “plans” with ambitious 2020 and 2050 targets across their business. But for many, making these plans happen, and capturing their impact internationally, is going to be about sustainable change in how supply chains operate. To make sustainability a reality, “technology providers, businesses, citizens and government will need to collaborate to develop the right policies and infrastructure that drive economic growth, and motivates sound behavior change and ensures the sustainability of our communities.”²¹

Summary

The future of supply chain management will involve financial, AND environmental AND social performance in addition to good governance practices throughout the life cycle of goods and services.²² As we have shown by the numerous examples within preceding chapters, innovative and early adopting companies are already driving sustainability internally and within their supply chains. With increased attention given to managing supply chain performance to an integrated bottom line, there are numerous frameworks and standards available to help you when operationalizing supply chain management. Understanding and defining sustainability within your own organization is only the first step in understanding this paradigm. Chapters 1 through 6 provide guidelines, tools, and KPIs, along with standards and frameworks for integration and implementation for managers struggling with the overwhelming amount of information about sustainable business practices.

Our approach in developing this book and associated online assessment tool has been to help decision makers in their search for answers to questions concerning sustainability, business models, drivers of value creation, and implementation of sustainable business practices within operations and supply chain management.

Further Reading

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For a more in-depth assessment, and to receive summary information of your AQs relative to others, visit the Sustainable Supply Chain Assessment tool for this book at: www.duq.edu/sustainable-supply-chain-management