

Effects of Green Purchasing Strategies on Supplier Behaviour

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Environmental management of purchasing and the supply chain (green purchasing) is now relatively common among larger companies and appears to be increasingly used as a corporate practice. For example, a 1995 survey of 1000 buyers of office equipment and supplies (Avery 1995) showed that 80% of respondents were taking part in environmental initiatives within their organisations. In 1993, just 40% of respondents responded this way (Avery 1995). Most readers will themselves know of organisations that are using environmental criteria of some sort in purchasing.

The practice is becoming common enough that academic efforts are being made to develop typologies of motivations and strategies. Drumwright (1994) proposes a framework explaining *why* organizations engage in green purchasing. She differentiates organizations into two general categories. The first category holds organizations for which green purchasing is a deliberate outcome of articulated strategies of socially responsible behavior. In Type I organizations, green purchasing is an extension of the *founder's ideals*. In Type II organizations, green purchasing is *symbolic* of the corporate mission. The second category holds organizations in which green purchasing is motivated by basic business reasons. Type III organizations see green purchasing as *opportune*, while Type IV organizations engage in it because of external *restraints*. Drumwright also proposes strategies for vendors who seek business from the four types of organizations.

Other investigators have studied groups of companies to identify *how* they engage in green purchasing. Lamming and Hanson's (1996) literature review and investigation of five major UK companies led them to propose five basic types of strategy used by companies for green purchasing:

- Vendor questionnaires
- Use of environmental management systems
- Life-cycle assessment
- Product stewardship
- Collaboration and relationships

Bowen *et al.* (Chapter 9 in this book) developed a more detailed categorisation of green purchasing strategies based on a survey of 24 business units in public UK companies:

- Product-based green supply: Participation in recycling initiatives that require cooperation with a supplier; Collaboration with a supplier to eliminate packaging; Efforts with suppliers to reduce waste.
- Greening the supply process: Building environmental criteria into the vendor assessment process; Use of a scoring system to rank suppliers on their environmental performance; Use of a supplier environmental questionnaire; Use of environmental criteria in the selection of strategic suppliers; Presentation of supplier environmental awards; Requiring suppliers to have an environmental management system;
- Advanced green supply: Use of environmental criteria in evaluation of buyer performance; Use of environmental criteria in risk-sharing and reward-sharing agreements; Participation in a joint clean technology programme with a supplier.

Lloyd (1994) proposed an even more general typology of purchasing strategies, with only two categories:

- External certification of suppliers
- Questionnaire and audit approach

The Global Environmental Management Initiative (GEMI) (see Chapter 3 of this book for details about this program) has published an Environmental Self-assessment Programme which is based on principles established by the International Chamber of Commerce in its Business Charter for Sustainable Development (ICC, 1991). Principle 11 of the Charter asks signatories:

To promote the adoptions of these principles by contractors acting on behalf of the enterprise, encouraging and, where appropriate, requiring improvements in their practices to make them consistent with those of the enterprise; and to encourage wider adoption of these principles by suppliers.

GEMI has developed a four-level typology of strategies or performance in working with suppliers that proceeds from compliance, to systems development and implementation, to integration into general business functions, to a total quality approach:

- Performance Level 1: Compliance - Company reviews and gives preference to suppliers that comply with environmental, health and safety laws and gives preference to suppliers that match the company's environmental policies and standards.
- Performance Level 2: Systems Development and Implementation - System exists to evaluate potential suppliers' environmental policies. Suppliers who do not comply with environmental policies are dropped.
- Performance Level 3: Integration into General Business Functions - Supplier selection models are integrated with environmental priorities

evaluation system. A coordinated approach for evaluating suppliers is followed by all business units.

- **Performance Level 4: Total Quality Approach** - Corporation gives preference to suppliers who accept and implement ICC principles. Supplier evaluation system considers their environmental management quality improvement systems and suppliers are continuously being evaluated for consistency with the corporation's environmental policies. Company collaborates with suppliers to identify and implement appropriate improvements in the corporation's and suppliers' Environmental Management Systems.

The categorisations described above, however, are incomplete, perhaps because the literature has tended to focus on companies that are already known for their leading-edge practices. Smaller companies and government agencies usually have much simpler green purchasing strategies. These usually focus on product content, such as use of recycled paper or avoidance of products with toxic chemicals.

For organisations that seek to promote sustainability beyond their own operations (type-1 or type-2 organisations) the key question include: What impact does the chosen supplier management or green purchasing strategy have on the behaviour of suppliers? Does the supplier simply provide technical solutions, or does it change its own behaviour towards more sustainable practices? Although there appears to be a common belief among all green purchasing advocates that the practice will encourage broad sustainability in the long run, that is not necessarily the case. Some strategies are more likely than others to promote sustainable behaviour among suppliers. The strategies also vary greatly in the cost and effort needed by the buyers.

2.1 From Supplied Products to Supplier Behaviour

The concern about impact of purchasing strategies on suppliers stems from the recognised need for environmental management throughout the full supply chain of a product. Suppliers can produce 'greener' products' without necessarily becoming green themselves. For example, companies worldwide have stopped using chlorofluorocarbons (CFCs) in production as a result of bans on those materials imposed by buyers and regulations, but there is no evidence of a corresponding worldwide wave of companies becoming green as a result. Suppliers can make technical changes to products or production practices without changing their management behaviour significantly. This is especially true in developing countries where environmental regulations are not strictly enforced and where the competitive advantages of environmental management are not recognised. The German ban on textiles dyed with azotropic dyes has caused thousands of textile producers to change their dyestuffs to more 'friendly' types but has generally not caused them to reduce pollution or improve their environmental management practices, yet this is what is necessary for a sustainable supply chain.

Ideally, green purchasing strategies should cause suppliers to develop good environmental management practices and pass on similar requirements for

improved environmental performance to their own suppliers, but, because this takes time and money, suppliers will not do it unless they also adopt environmental management as a behaviour paradigm. To use Drumwich's typology, the suppliers must move from type 4 (green as a result of restraints imposed by buyers) to type 1 or 2, green because of intrinsic motivations of corporate leaders (idealistic or symbolic of corporate commitments).

To investigate this further, a more comprehensive typology of green purchasing strategies is proposed. Each strategy can be considered for its effect on changing supplier's behaviour in the direction of reduced environmental impact and sustainable development. Each strategy can also be considered for the cost and effort it requires. Buyers will need to consider the trade-offs between impact on supplier behaviour and the cost and effort for the buyer within the framework of its own motivations and goals for green purchasing.

2.2 Strategies Used in Green Purchasing

The strategies listed below are ordered by the relative level of effort required by the buyer to implement them. Also discussed is the relative impact of the strategy on the supplier's environmentally sustainable behaviour. The ranking of strategies and impacts is, of course, subject to debate, and there are many variations possible within each strategy.

2.2.1 Product Content Requirements

Here, buyers specify that products must have desirable green attributes. This is perhaps the most common type of green purchasing and is exemplified by the many thousands of organisations that make it a policy to purchase paper with recycled content. The cost to buyers is usually not much higher than that of 'normal' purchasing practices.

The impact on supplier behaviour tends to be low and predominantly technical. The suppliers look for recycled stock to include in their products and may invest in special facilities for producing recycled stock, but there is no obvious incentive for the supplier to adopt sustainability strategies beyond those required to maintain market share.

2.2.2 Product Content Restrictions

In this case, buyers specify that products must not contain environmentally undesirable attributes. This is also a very common strategy. Bans on CFCs or other chemical content, on plastic foam in packaging and on solvent-based coatings are among the most common examples. Buyers may have higher costs because the elimination of product ingredients may require them to adjust their own production or product design. However, costs often are lower because the buyer avoids problems associated with using toxic chemicals or with disposing of excessive solid waste.

The impact on suppliers is again technical but is more likely to have positive environmental effects than are product content requirements. This is because the elimination of the use of toxic chemicals often reduces the supplier's own environmental impacts, after initial capital investments for production changes are made. The supplier may need to pass on the need for alternative chemicals to its own supplier, which increases the likelihood of a change in supplier behaviour.

2.2.3 Product Content Labeling or Disclosure

In this strategy, buyers require disclosure of the environmental or safety attributes of product contents. In the USA this is in fact common in the provision of material safety data sheets (MSDSs) with commercial products. However, MSDSs address only safety, not environmental effects. Other kinds of labels in use include environmental 'seals of approval', such as Green Seal, and indicators of relative environmental impact, such as scientific certification systems, offered by various commercial organisations.

The cost to buyers of requiring this information is very low because the buyer does not commit to actually buying a different kind of product and thus may not have to make any production or design adjustments as a consequence. However, the cost to suppliers is higher because they have to develop or obtain the label, which requires either internal research or fees to outside organisations. The impact on the suppliers may also be higher, because the exploration of environmental impact will at least be educational for management and perhaps more far-reaching than simply developing a technical solution such as eliminating a chemical ingredient or including recycled stock in the product.

Some studies support the observation that technical product standards are much more common than any other strategy. A survey of UK companies by *Supply Management* magazine showed that less than half used environmental performance to assess suppliers, but a far greater proportion claimed to use various sources to assess the environmental credentials of the raw materials themselves (Tyler 1997).

2.2.4 Supplier Questionnaires

Here, buyers ask suppliers to provide information about their environmental aspects, activities and/or management systems. The effort by buyers is higher than in dealing with products because the questions being asked must be related to the management goals and policies of the buyers, which requires internal management decision-making for the buyer. It is assumed that the buyer is ready to make the technical adjustments to production that are indicated by the match between supplier response and management goals; thus the cost of surveying suppliers is in addition to the technical costs discussed for product-based purchasing strategies.

A survey of 300 small to medium-sized businesses in the United Kingdom showed that over 40% had been asked about their environmental performance by their customers (Barry 1996). However, the survey also showed that most of the businesses were unconvinced of the need to improve their environmental performance, and 84% were unaware of the duty-of-care regulations about disposal of waste.

The cost for suppliers is in the development and provision of information. Suppliers who already have good environmental management information will find responding to questionnaires relatively easy. Others without the information to hand will have to develop it. The impact of this strategy on suppliers is questionable. For those suppliers who must develop new information, the discovery process may have an impact on management. However, without a clear indication from buyers that certain kinds of answers will result in negative action (reduced purchasing preference) there is no reason to assume that suppliers will take action beyond providing the information.

2.2.5 Supplier Environmental Management Systems

2.2.5.1 Uncertified Suppliers

In this case, buyers require suppliers to develop and maintain an environmental management system (EMS) that generally conforms to one of the recognised international standards, such as the British Standard 7750 (BS 7750), ISO 14001 from the International Organisation for Standardisation (ISO), the European Union Eco-Management and Audit Scheme (EMAS) and the Responsible Care initiative of the US Chemical Manufacturers' Association (CMA). However the buyer does not require the supplier to have the system certified as fully compliant with the appropriate standard, either through self-certification (allowed for BS 7750, ISO 14001 and Responsible Care) or third-party certification (required for EMAS).

The US automobile manufacturing industry, among others, is adopting this approach. Ford Motor Company is considering the use of ISO 14001 as a benchmark for EMSS to be used by its suppliers, although the company has not decided to require certification of its suppliers to the standard (Bergstrom 1996).

The cost to buyers of imposing this requirement on suppliers is quite low; buyers can simply demand that suppliers have an EMS. The cost to suppliers, of course, is much higher if they have to develop an EMS if they do not have one already, or if they have to modify their EMS to meet whatever specification the buyer requires. The impact on supplier behaviour is also higher than the impact of technical requirements as the supplier will have an organised approach to environmental management.

2.2.5.2 Certified Suppliers

Here, buyers require suppliers to have an EMS that is certified. This also is of low cost to buyers and of even higher cost to suppliers to ensure compliance with EMS specifications, especially since the cost of certification by third parties may be expensive. The impact on supplier behaviour would be greater than for uncertified EMS requirements because additional management resources would need to be allocated by the supplier.

All three of the major international EMS standards—ISO 14001, BS 7750 and EMAS—require that the EMS address suppliers' environmental aspects or their compliance with the buyer's environmental policies. However, the standards do not specify what the suppliers should do or whether the suppliers themselves should have EMSS or even be in compliance with environmental requirements.

It is critical to recognise that an EMS alone does not guarantee a significant improvement in supplier environmental behaviour (Hamner 1996). An EMS may be wrapped around a basic compliance assurance system that does not address any issues of sustainability other than minimal compliance with regulations. Thus the impact on supplier behaviour of an EMS, without additional requirements for specific moves towards sustainability, must be considered in general to be relatively low.

2.2.6 Supplier Compliance Auditing

In this strategy, buyers audit suppliers to determine their level of compliance with environmental requirements. This requires a significant effort by buyers and appears to be feasible only for larger organisations that already make a practice of close inspection of supplier operations. Buyers may use professional environmental compliance consultants to supplement their own capabilities for determining compliance status. Under this strategy, suppliers would be strongly motivated to achieve compliance with environmental requirements and would also engage in high-level dialogue with buyers about environmental issues; thus the impact would in general be higher than with the strategies outlined above.

2.2.7 Supplier Environmental Management System Auditing

In this case, buyers audit not only the compliance status of the suppliers but also their EMSS. This increases the buyer's efforts and may also entail the use of additional experts in EMS. Since the scope of supplier investigation is higher, the impact on suppliers would also be higher. Again, there remains the question about whether the supplier EMS is addressing sustainability, or only compliance assurance.

2.2.8 Buyers Set Their Own Compliance Standards

Here, buyers develop their own standards for environmental compliance and require buyers to meet these standards. Buyers conduct their own inspections to determine the level of compliance with the standards.

Members of the US apparel industry are notably using this strategy. The non-profit group Business for Social Responsibility is managing a project called 'Greening the Supply Chain in the Apparel Industry'. Members of the project include leading US apparel retailers such as Levi-Strauss, Nike, Gap, Eddie Bauer and others. The group of companies developed its own standards for waste-water discharge and is requiring their suppliers worldwide to comply with these standards. The motivation for this effort appears to be a recognition that environmental standards vary widely, especially in developing countries, and that simply requiring compliance with local standards may not result in effective environmental protection. Suppliers who do not meet the standards within a time-frame set by the buyers are dropped.

The effect on suppliers has been obvious. According to comments made by representatives of the apparel companies, suppliers are moving quickly to install

pollution-control systems that will meet the group standards for waste-water discharge. Some of the buyers are also educating suppliers about waste minimisation and cleaner production approaches as ways to meet the standards, but it appears that, in order to meet the deadlines set by buyers, the suppliers are moving quickly to the proven technologies of pollution control. Thus, this approach is changing supplier behaviour away from deliberate non-compliance but does not itself lead to supplier programmes for long-term environmental sustainability.

2.2.9 Product Stewardship

In product stewardship, buyers take responsibility for managing the environmental effects of products throughout the product life-cycle. Companies such as IBM are notable for their efforts to engage all the producers in their supply chain in discussions regarding environmental sustainability (Lamming and Hampson 1996). The Asset Recycle Management programme at Xerox focuses on managing all Xerox product materials from 'cradle to grave', with the objective of recovering asset values and reducing costs (Bhushan and Mackenzie 1994). This involves working with suppliers throughout the supply chain to manage recovery of materials as well as extensive application of design for environment (DfE) tools. The Responsible Care initiative of the CMA includes the Product Stewardship Code, which specifies that members must 'evaluate HSE [health, safety and environment] programmes of suppliers and require them to provide HSE information'.

Product stewardship requires a very high level of effort from buyers, but the effect on suppliers' sustainable behaviour is not obviously direct. Suppliers may make numerous technical changes to accommodate product stewardship demands, but may not themselves develop the management commitments to sustainability that are needed to ensure their own continuing efforts towards total quality environmental management. This obviously depends on the level and type of dialogue held between buyers and suppliers.

2.2.10 Education and Collaboration

In this approach, buyers educate suppliers about environmental issues and environmental management strategies and work closely with suppliers to solve environmental problems. A major focus of the education of suppliers is on the economic benefits of improved environmental performance. In 1991, the S.C. Johnson Corporation held an International Suppliers' Day Environmental Symposium at its headquarters during which the company's objectives and concerns were presented and breakout sessions were held to discuss solutions to technical problems (Makower 1994).

The Nike Corporation's Environmental Action Team (NEAT) is another example of education and collaboration with suppliers. In 1996 Nike held an environmental summit at its headquarters, attended by representatives from many of its contract manufacturers around the world as well as Nike country representatives. A significant part of the summit was educating the participants

about the benefits and strategies of pollution prevention. Nike's chemists are working closely with suppliers to implement the use of water-based adhesives in place of solvent-based ones and the company has hired a full-time pollution prevention expert to visit and work with the suppliers.

This approach seems to require the same high level of effort from buyers as product stewardship, but the impact on supplier behaviour is much more specific and targeted. A major emphasis is placed on educating the supplier's top management about the economic benefits of cleaner production and pollution prevention, within an overall mission of contributing to sustainable development. Even if the suppliers do not embrace sustainability as their own mission, under this strategy they are more likely to move their behaviour towards sustainability than they are under any other.

2.2.11 Industrial Ecology

In this strategy, buyers work with suppliers and with customers to develop a fully integrated system for recycling and re-use of materials within an industrial ecology framework. The only notable example of industrial ecology in practice is the famed Kalundborg industrial area, which evolved over time rather than through deliberate planning (KCIS 1996). In this system, organisations are both buyers and suppliers to each other.

Companies such as AT&T have embraced the concept of industrial ecology (see the words of Robert E. Allen, chairman of AT&T; Allen 1995), but putting it into practice remains a formidable obstacle that may never be fully realised on a large-scale basis. The impact on suppliers is equal to the effort to that on buyers, because effectively they become interchangeable. With many buyers and suppliers, any imbalance of effort can significantly impair the metabolism of an industrial ecosystem.

2.2.12 Overview

Figure 2.1 shows the relative positions of the green purchasing strategies outlined above against axes of impact on supplier behaviour, and buyer's level of effort. The positions of the strategies can vary as the strategies are modified or combined, but Figure 2.1 does indicate that there is a clear trade-off between the buyer's desire to promote supply chain sustainability through green purchasing and the level of effort required.

Recent research supports this generalised set of relationships. In a survey of US chemical firms, Theyel (see Chapter 8) found that a reciprocal learning process between customers and suppliers occurs as firms exchange information to set and meet environmental requirements. Firms that collaborate with customers tend to collaborate with their suppliers similarly, with the greatest successes in waste reduction occurring in firms that meet their customers' environmental standards and in turn set standards for their suppliers.

In the United Kingdom, Charter *et al.* (2001) of the Centre for Sustainable Design conducted a survey of major corporations to evaluate the implementation of sustainable supply chain management (SSCM). They also found that the firms with

the most impact on their suppliers' environmental behaviour were collaborating closely with those suppliers and making significant efforts over time. Charter *et al.* reported that key factors that have influenced successful SSCM strategies have been

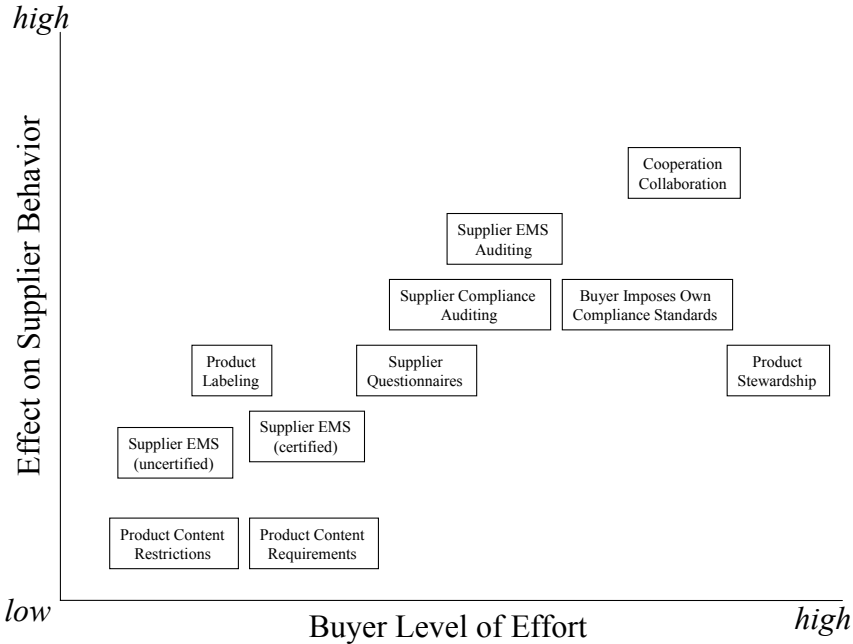


Figure 2.1. Green purchasing strategies: level of buyer effort in relation to impact on supplier behaviour

the power of companies over the supply chain and the role of business risk drivers in forcing companies to manage risk more effectively in their supply chains. The key measure of the success of SSCM tools appears to be the amount of buy-in from senior management (Charter *et al.* 2001).

2.3 International Purchasing Concerns

The assumption that green purchasing promotes better environmental performance from suppliers is particularly questionable when suppliers are located in countries or locations where environmental regulations are lax or unenforced. In such places there are few or no other drivers for improved performance and usually very little information available to suppliers about the competitive benefits of environmental management. My experience visiting manufacturing companies in South-East Asia has revealed numerous examples of companies that have changed their product contents to meet Western buyer requirements, but the companies have not adopted environmental management practices or in some cases have not even installed

pollution control systems necessary to meet local environmental protection standards.

The few instances we have seen of top management commitment to environmental performance have been in companies where the Western buyers have engaged the management in serious dialogue about the need for and benefits of environmental management. Even with the buyer intentions and goals clear, it has been necessary for the buyers to provide numerous examples of how environmental management has improved the profits of companies *in developing countries*. Examples of Western companies saving money through environmental management do not impress managers in developing countries.

Fortunately, there are now many published examples of environmental management success stories from developing countries, and these can be used to enhance discussions with suppliers. But personal, repeated contact appears to be critical in getting supplier interest, and the buyer may be the only source of information available about environmental management strategies that can improve the supplier's business position.

Even so, the impact of green purchasing strategies on suppliers in developing countries is generally going to be very limited, for a simple reason: buyers can have an effect on their immediate suppliers, but it is very unlikely that the suppliers will in turn try to have an effect on their own suppliers. It usually takes a great deal of effort simply to respond to the buyer's immediate concerns about compliance and product contents. Buyers will probably have to work closely with suppliers if there is to be any transfer of environmental management practice or concern further down the supply chain.

2.4 Recommendations for Managers

Before becoming focused on green purchasing, managers need to decide what outcomes they hope to achieve. If the objective is to reduce the environmental concerns created by excess packaging, toxic ingredients and so on then firms can include environmental specifications in the product requirements, but if the objective is to actually improve the suppliers' own environmental performance it will be necessary to have a more extensive interaction with them directly.

Managers should begin with an evaluation of their own firm's capacities. Changing supplier behaviour to improve performance takes a lot of work. Does the firm have significant influence with the supplier? Is it prepared to engage the supplier at top-management levels in discussions about the environment? Is the firm's own top management committed to long-term environmental collaboration with suppliers? Is strategic supply chain management a focus of the firm and is it building capacity in this area in general?

Next, it is important to determine specific goals for the supplier's environmental performance. These are often focused on product designs, in which case the collaboration is to be a technical one. But if the goal is for the supplier to have improved management of environmental issues the collaboration will need to be at a managerial level, and possibly include capacity-building or mentoring for the supplier. The goals should also be in line with the firm's own strategic

directions. For example, a firm seeking a low-cost position should focus on improving the supplier's efficiency of resource use and on waste minimisation, which can reduce the supplier's costs and thus the sales costs. If a firm is seeking a differentiation strategy or a high-value strategy the goals should be to improve the environmental quality of the firm's products, in collaboration with the supplier.

The firm should then begin building the capacity of its own purchasing managers. They are the contact points and interfaces with the suppliers and they need to be well-trained in concepts of environmental management, strategic supply chain management and collaboration. This is no small undertaking in many cases. Many purchasing managers have relatively adversarial relations with suppliers. They are always trying to get lower prices and faster delivery and better quality, but not in a collaborative way. To promote environmental improvement, purchasing managers need to act as mentors and advisors. Environmental staff should train purchasing staff, and vice versa.

Several excellent new tools have been developed to help train purchasing managers. The Global Environment Management Initiative, a consortium of major US corporations, has produced the publication, *Strategic Sourcing: Environment, Health and Safety: New Paths to Business Value*. This source is designed to train purchasing managers about the business benefits of promoting environment, health and safety to suppliers and contractors and provides specific methods (Harris covers this project in detail in this book; see Chapter 3). The US EPA (2000) has produced a manual, the *Lean and Green Supply Chain*, which also provides training. Many other organisations have also produced training materials. There is no shortage of resources, many of which are available for free.

Finally, all should participate in an exploration of the potential benefits to both buyer and supplier from environmental performance improvement. Green purchasing in a collaborative framework can have significant long-term benefits, but these need to be clearly identified and understood by all parties. It may be possible to estimate cost savings, but it is more important for all parties to understand that long-term improvement in environmental performance is a result of better management, which has benefits across the board that are both tangible and intangible.

2.5 Conclusions

Green supply management is becoming a major component of corporate environmental management strategies. When the motivation for green supply management is for business opportunity or to respond to external restraints, then buyers are not likely to be concerned about the impact of the strategy on the suppliers' environmental behaviour. But if the motivation for green supply management is based on leadership commitment to sustainable development or the desire to promote sustainable development generally, then the question of impact on supplier behaviour becomes very important. The more directly the buyer is involved with the supplier, and especially with the top management of suppliers, the more likely it is that buyer commitment to sustainability will have an effect on the supplier's behaviour. In many cases it will be necessary for the buyer to make

the business case for environmental management and to educate the supplier in methods for reducing environmental impacts.

Organisations that seriously want to promote environmental sustainability will need to recognise that green purchasing is only a limited tool. For it to have a significant multiplier effect the organisation will need to commit the resources necessary to engage suppliers in sustained dialogue and education. The purchasing department will need to become a centre of excellence in 'train the trainer' for environmental management.

References

- Allen, R.E. (1995) 'Foreword', in T. Graedel and B. Allenby (eds.), *Industrial Ecology* (Englewood Cliffs, NJ: Prentice Hall).
- Avery, S. (1995) 'Buyers Go Green: Slowly', *Purchasing* 119.4: 43-45.
- Barry, A. (1996) 'Buyers Start to Spread the Green Message', *Purchasing and Supply Management* (February 1996): 21-23.
- Bergstrom, R. (1996) 'The Next "Quality" Job at Ford: Getting Green', *Automobile Production* 108.11: 54.
- Bhushan, A., and J. Mackenzie (1994) 'Environmental Leadership Plus Total Quality Equals Continuous Improvement', in J. Willig (ed.), *Environmental Total Quality Management*, (New York: McGraw-Hill): 71-93.
- Charter, M., A. Kielkiewicz-Young, A. Young and A. Hughes (2001) *Supply Chain Strategy and Evaluation* (London: Centre for Sustainable Design, University College).
- Drumwright, M. (1994) 'Socially Responsible Organisational Buying: Environmental Concern as a Noneconomic Buying Criterion', *Journal of Marketing* 58.8: 1-19.
- Hamner, B. (1996) 'A Strategic Approach to ISO 14001', *Corporate Environmental Strategy* 4.3: 46-52.
- ICC (International Chamber of Commerce) (1991) *Business Charter for Sustainable Development* (Paris, France: ICC).
- KCIS (Kalundborg Centre for Industrial Symbiosis) (1996) *Industrial Symbiosis: Exchange of Resources* (Kalundborg, Denmark: KCIS).
- Lamming, R., and J. Hampson (1996) 'The Environment as a Supply Chain Management Issue', *British Journal of Management* 7 (Special Issue, March 1996): 45-62.
- Lloyd, M. (1994) 'How Green Are My Suppliers? Buying Environmental Risk', *Purchasing and Supply Management* (October 1994): 36-39.
- Makower, J. (1994) *The E Factor* (Oakland, California: Tilden Press).
- Tyler, G. (1997) 'Blueprint for Green Supplies', *Supply Management* 2.7: 36-38.
- US EPA (US Environmental Protection Agency) (2000) *Lean and Green Supply Chain* (Washington, DC: US EPA).



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