Business Strategy and the Environment
Bus. Strat. Env. **8**, 296–310 (1999)

SUSTAINABLE BUSINESS: LEARNING – ACTION NETWORKS AS ORGANIZATIONAL ASSETS

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This paper develops the concept that sustainable development is a process that centres around a complex series of continuously negotiated business and social projects or experiments. This process involves different parts of the business and industrial system, including many of a firm's stakeholders in continuous learning, action and change. Processes of this kind can be viewed as multi-party, *learning – action networks* that span business organizations and stakeholders in society. This paper presents a case study of a Canadian company, acknowledged as a leader in environmental management. It outlines how the company responded to demands for more sustainable practices. It describes how the company's approach to strategic planning identified and responded to these issues, how its approach was progressively refined and redefined, and the way that the organization's culture and strategic processes influenced its willingness to learn and act with a network of internal and external stakeholders. Based on case findings, the paper identifies the critical role for learning – action networks in the transition to more sustainable business organization and the need for these networks to be supported by appropriate organizational culture and processes. Copyright © 1999 John Wiley & Sons, Ltd and ERP Environment.

Accepted 18 June 1999

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CCC 0964-4733/99/050296–15 $17.50

INTRODUCTION

This paper presents a study of the *learning – action network* that influenced the environmental management and sustainable development practices in a Canadian company acknowledged as a leader of environmental management practice in the 1990s. During the study, the company also began to distinguish between its commitment to environmental management and the broader, emerging concept of sustainable development. This research follows from the experiences of one of the authors in environmentally driven, multi-party collaborative initiatives in the UK during the mid- to late 1980s (Vittery and Roome, 1989). These initiatives were developed by environmental non-government organizations (NGOs) as part of their policy response to the World Conservation Strategy (IUCN, 1980), which argued for new organizational forms that cut across existing sectors, functions and disciplinary boundaries. These and similar initiatives are described by Carley and Christie (1993). Operationally these initiatives linked organizations that shared a physical space (e.g., river basin or industrial area) in new ways to address environmental concerns. These partnerships involved joint action

to resolve problems inherent to systems (O'Riordan, 1971) or that arose from turbulence in organizational domains (Emery and Trist, 1965, 1973). They involved the establishment of collaborative structures to develop shared perceptions of problems and to determine and undertake agreed courses of action (Gray, 1989). Many of these initiatives involved companies, but they were invariably led by NGOs (Hartman and Stafford, 1998).

In the late 1980s, the shift in corporate environmental management from traditional non-strategic, reactive approaches to more strategic, proactive stances (Hunt and Auster, 1990), provided the possibility that companies might engage in multi-party collaborative initiatives to link their business and environmental concerns. From a sustainable development viewpoint, this approach is advocated in the Brundtland Report (1987) and Agenda 21 (Earth Summit, 1992), and the importance of inter-organizational and intra-organizational links and networks to corporate environmental management and sustainable development has been discussed in the literature (Roome, 1994; Clarke and Roome, 1995; Clarke, 1998).

The central ideas of this study were the following.

(i) Environmental management and sustainable development require companies to acquire knowledge that is not ordinarily found in their existing repertoire or experience.
(ii) Environmental management and sustainable development require companies to participate in collaborative action that links traditional business issues to a set of environmental and social concerns.
(iii) The development of this knowledge and action involves a broad set of actors with an interest in a company's activities including strategy, technology management, environmental management and sustainable development.
(iv) A multi-party mechanism to bring about the development of knowledge and provide the ground for collaborative action for environmental management and sustainable development is a learning – action network.

A learning – action network is defined as a set of 'relationships which lay over and complement formal organisational structures linking individuals together by the flow of knowledge, information, and ideas' (Clarke and Roome, 1995). These networks 'are embedded in the complex of organisational and social relationships, management structures and processes that constitute business and its social context' (Clarke, 1999). Companies that seek to develop knowledge and action through learning – action networks which span their internal and external stakeholders have been termed 'meta-textual' organizations (Roome, 1997).

The research presented here is part of a larger study (Clarke, 1999) initiated in 1992/3 prior to the publication of the theoretical literature on corporate environmental and sustainable development. This literature focuses on multi-actor initiatives compatible with the learning – action network notion including ecologically sustainable organizations (Starik and Rands, 1995), strategic bridges between business and environmental organizations (Westley and Vredenburg, 1991; Sharma *et al.*, 1994; Stafford *et al.*, 1999), institutional perspectives of inter-organizational learning (Jennings and Zandbergen, 1995) and adjustments in the structure of industrial networks in response to external environmental change (Östlund, 1994). More recently, Rowley (1997) has contributed to the discussion on stakeholder interactions by developing a stakeholder network theory based on the concepts of network density and the centrality of an organization in its stakeholder network. Others, notably Hart (1995), have addressed the demands on organizational resources and capabilities arising from these multi-actor relationships.

The research design used in this study involved ethnographic methods. These permit an intimate, detailed observation of the interaction between the learning – action network that surrounds a company's formal approach to environmental management and sustainable development. The research used a grounded-theory approach; accordingly, it formulated propositions rather than tested hypotheses derived from existing theory (Strauss and Corbin, 1990).

The paper is organized in four sections. The first section sets out the background and research methods. The second section describes the company and presents the findings of the case analysis. The third section discusses these findings in

the light of previous and subsequent research. It also draws on the authors' emerging ideas about how corporate environmental management and sustainable development oblige the development of highly networked or meta-textual organizations as a basis for learning and action. It concludes by offering a set of propositions for future research.

BACKGROUND AND METHOD

This paper examines how a publicly listed Canadian utility, known in this paper as 'SysTec' (pseudonym), used networks of learning and action to define its approach to environmental management and sustainable development practice. It specifically focuses on how SysTec's internal strategic process and personnel supported the move toward an increasingly open approach to stakeholders within the corporation. The paper analyses the characteristics of SysTec's approach and its ability to identify and act on elements of the environmental and sustainable development agenda. The case study forms part of a larger grounded theoretical study undertaken between 1993 and 1995 of the move toward more sustainable technology management in three related companies in Canada and the UK including 'EngTec' and 'HiTec' (pseudonyms). These companies were connected in many ways, through third-party organizations, such as an industry association or direct relationships between employers of, say, EngTec and SysTec. The companies were also connected through the products and services they each provided one another. The present study reports on only SysTec and part of this learning – action network. This network was not apparent to its members, and only revealed through the inquiry process used in the research. The learning – action network is dynamic and has 'fuzzy' boundaries. Its overall shape changes as new needs arise and as responses are made by network members. While some parts of the network were highly structured around existing organizational structures and relationships, others parts were very informal, involving personal contacts.

This study draws on interviews with more than 35 members of SysTec's learning – action network, identified using a 'snow-balling' technique (Jorgensen, 1989). These key informants included SysTec senior managers, environmental specialists and engineers and additionally members of the wider external network identified by SysTec employees as influential in the changes taking place in the company. Informants were asked to identify other individuals who were influential in shaping the company's strategy, environmental performance, practices and technology (Clarke, 1997). Documentation available in the public domain was also included.

CASE STUDY AND EMPIRICAL FINDINGS

This case study describes SysTec and the interaction between the company's strategic management processes, its environmental initiatives and the learning – action network. The case study is set out in four parts. SysTec's business and its context are described. SysTec's approach to strategic management connected with the company's environmental thinking and practice is presented, highlighting the role of interpersonal networks in the emergence of corporate environmental practice. SysTec's evolving response to the environment and sustainable development agendas is reviewed, and, finally, the implications for sustainable development are described.

SysTec's business and context

Founded over 150 years ago, SysTec's business is to distribute a non-renewable resource. It operates in specific (franchise) areas, where it is responsible for storing, transmitting, distributing, selling and supplying this resource. It is a relatively small Canadian company with 3000 employees, relying heavily on externally contracted research and development. The company is known for its strong commitment to the communities it serves. Within the company, there is a 'culture' of individual responsibility grounded in an ethic of corporate citizenship (*Annual Report*, 1993) that underpins all corporate actions and attitudes of its personnel. It has an organizational philosophy to be a 'role model for others' (*Earth Day Annual Report*, 1993) and a belief that it is 'part of the solution' for an environmentally sustainable future (*Our Resource and the Environment*, 1990).

SysTec operates in a regulated industry with rate and profit distribution controls. SysTec has to present an annual case to the regulator that justifies its rates against a planned programme of activities. The regulator (who evaluates SysTec's interests against community and environmental interests) makes strict demands on its environmental initiatives and research programmes. This regulatory regime means that any action by other companies in SysTec's franchised area to vary their rates, community practices or environmental interests can have implications for SysTec and its competitors. While the company has not purposefully sought this leadership position, companies solicit SysTec's advice and leadership in environmental matters. Accordingly, SysTec's activities can influence industry standards.

SysTec enjoys a cooperative relationship with other companies supplying the same resource in other franchise areas. They share ideas, particularly in relation to environmental concerns, informally through one-on-one contacts and formally through research partnerships, industry association initiatives and community-wide projects. Relationships with companies that supply substitute non-renewable resources in SysTec's franchise area, however, are less harmonious.

Strategic planning, environmental management and sustainable development at SysTec

Prior to 1989, SysTec's environmental activities involved a loose set of initiatives required by legislation, voluntary initiatives originated from employee interests such as waste management and office recycling and general 'housekeeping' initiatives and programmes designed to improve operational efficiencies. During the late 1980s, SysTec encountered rising concern about environmental issues and demands for environmentally sound corporate behaviour from the general public and its regulators, including environmental issues provoked by the Montreal Protocol on ozone depletion, and more broadly, global climate change. There were also concerns for better resource and product stewardship. These pressures were supported by a pull from within the company, as employees sought to contribute to environmental improvement, consistent with the company's social responsibility ethic.

These factors prompted SysTec to develop a more systematic approach to environmental concerns. In 1989 an environmental strategy committee (ESC) was formed (comprising senior managers from across the company, including its environment department) and a process of organizational change was begun. An environmental management system (EMS) resulted, which, by 1994, was an integral part of the company's strategic decision making processes.

SysTec's approach to environmental management was underpinned by four principles during this period: (i) it was 'low key'; (ii) it led by example; (iii) it worked with stakeholders and (iv) the approach was strategically oriented. A 'low key' approach meant the company did not actively seek highly visible recognition of its environmental programmes or community projects. For example, one environmental manager noted

> I think because we're regulated we can't throw gobs of money at it [community projects]. Our level of sponsorship is basically $5000 or less ... And our demands for recognition are usually low key and subtle ... There is a recognition [in the Environmental Services Department] that we try to do the right thing for its own value, not necessarily because we see it as part of a larger marketing strategy ... We don't necessarily need to be broadcast to everyone as saviours of the world (interview III).

SysTec believed it had a responsibility as part of the solution to society's environmental problems. Consequently, the company 'led by example', seeking to put its own house in order (*Environmental Plan*, 1994, p 1) and by acting on national and international environmental initiatives, such as climate change. The rationale behind this approach is that

> If you say that you are part of the environmental solution ... that implies an obligation that ... your own operations will be beyond reproach. But to me it also implies an obligation that you will also help develop what is a solution to the concerns before [you] and you can't do that alone, you have to do that as part of a larger society (interview III).

Partnerships and stakeholder involvement were important aspects of SysTec's environmental philosophy. Further, the company emphasized the need for improved mechanisms for communication with stakeholder groups and placed importance on environmental education for employees and the general public.

> . . . [when] we develop partnerships [we develop] the ability to be able to sit down and listen to these people and get a better understanding of what their interest is, their perspective and, in terms of a company doing its strategic planning, . . . how it should approach the environmental issues, that kind of grass roots polling as it were, building trust . . . (interview III).

SysTec solicited the perspectives of its many stakeholders rather than seek to influence or dominate their opinion. It used insights from these interactions to review and improve corporate environmental programmes and activities.

SysTec's process of strategic planning and decision making was also a key to its ability to respond to changing circumstances in the business environment. It enabled the company to identify issues in its business environment, to assess their corporate implications, and to initiate and implement appropriate programmes. This supported the changes made in corporate environmental activities over a relatively short time period. SysTec's strategic management process contributed to the 'continuous improvement' of its environmental programmes, through the identification of new environmental concerns, the implementation of new environmental activities and the revision of existing approaches.

SysTec's strategic planning process was designed to identify factors in the business environment that would shape the company's activities in the coming year. These factors are described by senior management as 'key strategic drivers' (interview I). This strategic planning process predated the emergence of environment and sustainable development on SysTec's corporate agenda. Since 1989, successive 'environmental' components were identified by this planning cycle. Part of the strategic organizational response to environmental concern was to integrate the company's EMS and the Due Diligence Program (DDP), required by law, into its planning process.

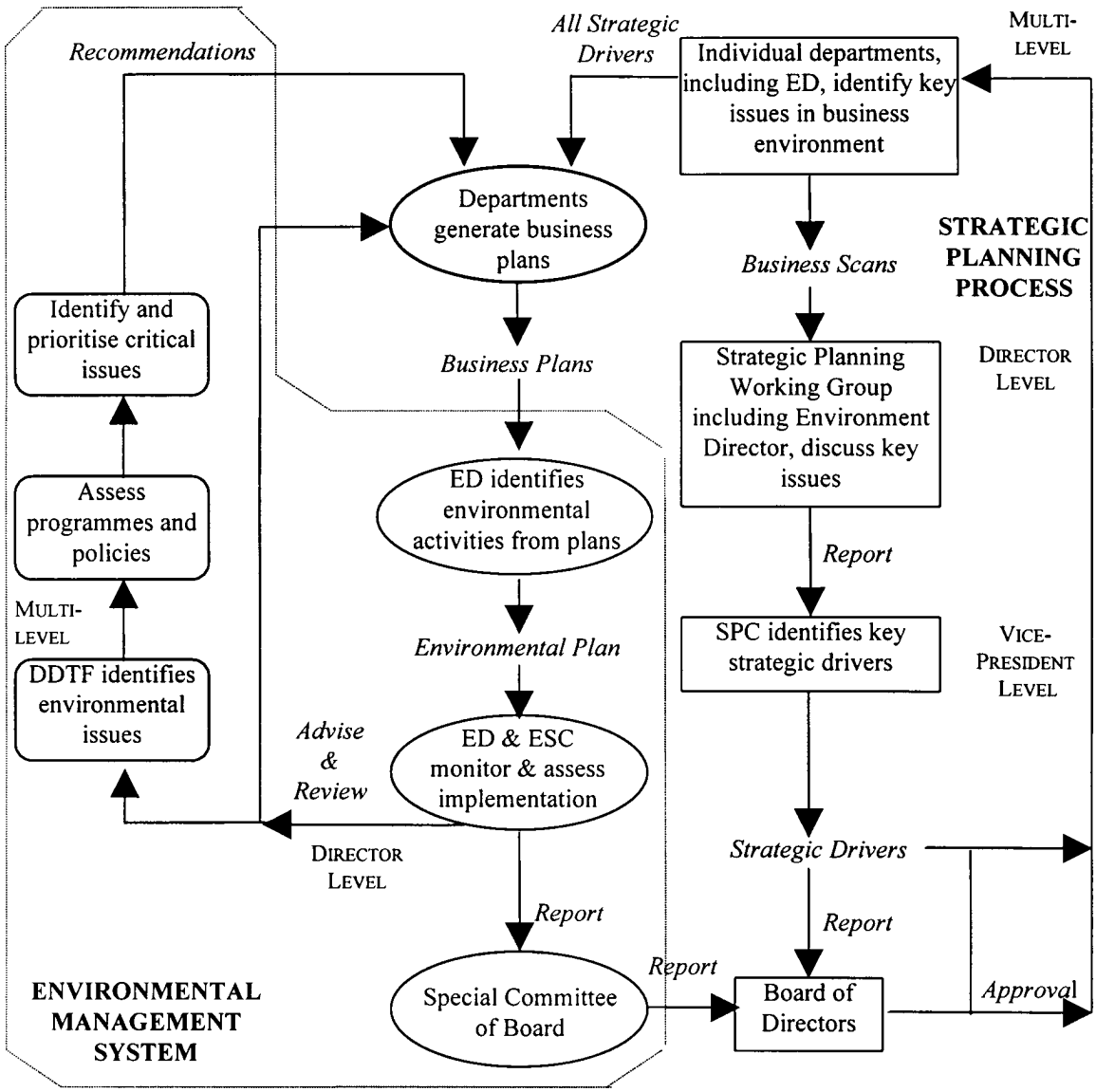
A diagrammatic representation of the stages in SysTec's annual strategic planning process is shown in Figure 1. This outlines the process that operated after 1994 described by informants. It indicates how environmental management, through EMS and Due Diligence, became integral to the SysTec's business planning cycle. The figure shows the linkages between the EMS and DDP to the overall process.

SysTec's strategic planning process required all departmental directors to produce a 'scan of the business environment [context]' to identify issues of strategic importance. Directors discussed these business scans formally within strategic planning working groups (SPWGs) and informally through their day to day operational relationships. This process was designed to ensure that each department was aware of the issues identified by other departments. It provided department heads with a complete range of factors in the business context that were affecting SysTec's departments, not just those specific to their department. In practice, several departments identified environmental issues as critical business concerns. A team of Vice Presidents (VPs) and senior managers, who are members of the strategic planning committee (SPC), reviewed these business scans. This committee decided which strategic drivers would be used to guide company activities.

Responsibility for the DDP process rests with a due diligence task force (DDTF) drawn from managers across the company. It considers all aspects of the company's operations and areas of potential environmental risk, and determines whether SysTec's existing procedures are adequate. DDP keeps abreast of activities in the industry, 'not necessarily to be ahead of the pack, but certainly that [they've] got a plan in place to handle it, just in case something happens' (interview II). The due diligence exercise occurs before the business planning cycle, allowing departments to

> [R]ead it, assimilate it, ask questions and then sit down to decide what should I and my department be doing in terms of cost effectiveness, productivity, environmental protection, customer service? (interview III).

The DDP ensures that environmental risks are continuously assessed and integrated into the



Legend

- Strategic Planning Process
- Environmental Planning *
- Due Diligence Programme *
- Output

* EP and DDP form the basis of SysTec's EMS

Key:

DDTF - Due Diligence Task Force
ED - Environment Department
ESC - Environmental Strategy Committee
SPC - Strategic Planning Committee

Figure 1. Relationship between strategic planning process and EMS at SysTec

business planning cycle, even if environmental issues do not emerge as specific strategic drivers.

The environmental planning and DDP loops shown in Figure 1 form the basis of the company's EMS. The strategic planning process envelops the company's EMS. Taken together these three management processes shown in Figure 1 facilitated the integration of environmental concerns and responses into all levels of SysTec's decision making, from strategic to operational. As one environmental manager described it,

> [W]e try to use existing business planning procedures, so we don't reinvent the wheel, but we try to embellish and enhance the existing ones so that they have the environmental factor . . . at the end of the strategic planning process . . . [senior managers] come up with the strategic themes that they think are important, [that] the business managers should think of. In the last few years, environment has been one of those. Now it doesn't have to be there all the time . . . But at least it gets fair weight. [The Environment Director] is very much involved in that process. So it's an opportunity to directly make presentations as to what environmental issues are before us, pressures, opportunities, threats that we should factor in (interview III).

Once strategic drivers are established, each business department brings forward its own business plans detailing the environmental activities that are guided by the company's DDP. Members of the environment department compile the company's annual environmental plan from these initiatives. They assist in programme development and monitor and review the company's environmental performance. The Environmental Director is responsible for reporting progress to a Special Committee of the Board of Directors, which reports to the full board (*Annual Report*, 1991, p 13).

The outcome of these processes is that the environment emerged as a strategic driver for the corporation in 1991 and 1992, but not in 1993, as the initial response to the 1991 and 1992 agenda had been operationalized. Several key informants referred to this as the process through which environment was embedded in the company's culture and operational activities. Although environment was not a strategic driver in 1993, it was identified as an important company performance measure. Consequently, departments began to include environmental performance in their business plans to measure success in meeting SysTec's environmental commitments, as set out in the company's environmental policy and environmental principles. In 1994, environment again emerged as a strategic issue under the umbrella of corporate responsibility and citizenship along with employee development, market share and growth targets and financial goals.

In 1994, the ESC established a set of corporate environmental priorities, ranging from low priority actions (e.g., waste management and environmental manuals) to high priority actions (e.g., environmental training and environmental partnerships). These action areas led to the development of an enhanced set of environmental performance objectives with targets and measures designed to ensure that the company continuously improves its environmental performance (*Environmental Plan*, 1994, pp 23–24).

SysTec's emerging approach to sustainable development

SysTec's recent environmental commitment is focused around values and goals that support the ethic of corporate responsibility that has guided the company throughout its history. These emphasize sensitivity to customer and employee needs, local community concerns and environmental implications. In its *Annual Report*, the company acknowledges its responsibility to enhance shareholder value, but sees this as only one of its goals. SysTec's environmental programmes are influenced by its unique regulatory circumstances, with its expectation that the company will continue to promote new and improved approaches to environmental protection and management.

SysTec's environmental position is also shaped by the environmental impact of the resource it supplies. This requires the company to be conscious of health and safety responsibilities, around the efficient and safe use of the resource. SysTec, with other members of its industry, views its product as part of today's solution to society's search for a more sustainable future. The product is widely acknowledged as having significantly

less environmental impact than commercially available substitutes. In company literature, SysTec promotes its resource as '[N]ot perfect but a great step in the right direction' (*Our Resource and the Environment*, 1990) while acknowledging that '[S]tewardship of the environment is everyone's responsibility' (*Environmental Initiatives*, 1991). SysTec also sees itself as 'part of the solution' to more environmentally sustainable futures (*Our Resource and the Environment*, 1990).

SysTec was an early signer to the International Chamber of Commerce's (ICC's) Business Charter for Sustainable Development. According to SysTec: 'The Charter comprises sixteen principles for environmental management which, for business, are vitally important aspects of sustainable development' (*Environmental Plan*, 1994, p 2). However, apart from this commitment, and a passing reference to sustainability under the company's list of strategic priorities in 1994 (*Environmental Plan*, 1994, p 23), there are no explicit references to sustainability in company documents that either define sustainable development or provide related implications for the company.

SysTec's approach was initially consistent with the emphasis in the ICC charter on the management of environmental effects and the notion that its overall business provides a bridge from an unsustainable past to a more sustainable future. However, SysTec's environmental management approach has become more sophisticated and increasingly consistent with broader sustainable development. While SysTec's approach to environmental policy in 1989 (*Statement of Environmental Principles*, 1994) emphasized a commitment to conduct operations in an environmentally sensitive manner, promote employee and public awareness of environmental issues, encourage use of its product as the environmentally preferred choice and develop technology to improve efficiency in resource utilization, by 1994, SysTec had a *Statement of Environmental Principles* that read

> [SysTec] recognises the intrinsic value of nature and is committed to conducting all of its operations in an environmentally responsible manner, with a view to protect and maintain the environment for future generations. This Statement of Environmental Principles guides the Company in achieving its commitment to environmental protection and citizenship. It is the obligation of every employee to understand his or her environmental responsibilities . . . .

This document does not specifically reference sustainable development but the explicit recognition of the 'intrinsic value of nature' and 'citizenship' together with the company's commitment to environmental stewardship, partnership and learning with others suggests an approach that goes beyond conventional corporate environmental management. It certainly presents a step beyond the company's earlier identification of itself as 'a responsible corporate guardian of a non-renewable resource' (*Environmental Plan*, 1991). The emphasis on understanding different stakeholder values, sharing ideas and working cooperatively with different groups implies an embedded understanding of the corporate value of engaging in relationships that bring about organizational and social learning and change.

Characteristics of SysTec's Approach to More Sustainable Practices

Some aspects of SysTec's approach to environmental management and sustainable development are described next. Table 1 pinpoints major milestones in SysTec's environmental management approach during the period between 1989 and 1994. It identifies the process of change and the outcomes that are linked to SysTec's learning about sustainability. These changes can be categorized as management structures and processes, communication activities and partnership and collaborative initiatives. Each is discussed below.

Management structures and processes at SysTec undertook environment as a strategic driver. As noted earlier, the strategic planning process, EMS and environmental committee structure ensured that all levels of personnel were involved in the development of environmental programmes and the shaping of environmental thinking within the company. A company-wide training programme was begun in 1994, to ensure that the company's environmental commitment was fully understood and that roles and responsibilities were clearly identified. This training programme complemented the management process. In addition, the

Table 1. Major environmental milestones at SysTec

Period	Philosophy	Major milestones
1989	Environmental responsibility & protection	● Environmental strategy committee formed ● Environmental policy endorsed ● Annual environmental planning process initiated and first environmental plan produced
1990–1993	Form environmental protection to environmental stewardship	● Environmental Services Department established ● Code of environmental ethics added to policy ● Corporate environmental logo launched & a set of informational pamphlets produced about global environmental issues and SysTec's responses to these concerns ● Environmental management system (EMS) and Due Diligence Program (DDP) introduced ● Environmental audit process initiated ● Waste management target surpassed and redefined ● Partnerships established, interest group meetings held, environmental research collaborations inititated ● Collaborative projects developed in response to regulatory requirements ● Earth Day Committee set up and annual Earth Day activities launched
1994	Environmental stewardship and citizenship	● Statement of environmental principles replaced code of environmental ethics ● Environmental plan revised as a more strategic document ● EMS and DDp strengthened and independent assessment of environmental activities commissioned ● Environmental priorities established and additional environmental targets set ● Comprehensive training programme launched ● Partnership and collaborative activities continued

company made environmental information available through an in-house electronic bulletin board.

SysTec suggests that the strategic process incorporated the new environmental management and sustainable development agenda in a number of ways. This involved

(i) problem identification – where environment was picked up as a strategic driver,
(ii) operationalization – where environment was integrated into existing activities with new systems adopted and routinized, including additions to the strategic planning process itself – and
(iii) redefinition – where environment was dropped as a stand-alone strategic driver to re-emerge under the umbrella of a new strategic driver described as 'corporate responsibility and citizenship'.

The ability of the strategic process to recognize issues and to create the ground for integration is seen as important.

Integration took place on a number of levels. First, separate strands of the 'environmental agenda' before 1989 were integrated into a single strategic issue at the beginning of the 1990s, and an overall organizational response was formulated to the environmental agenda. By the end of the case study, the newly fashioned strategic term 'environment' was recast and integrated as part of a wider issue connected to corporate social relationship. This helped SysTec move its conception of its environmental impacts and activities from environmental protection and management toward a broader notion of sustainable development. Second, SysTec learned how to integrate these issues within its organizational structure and its strategic planning processes that informed organizational change. Finally, the overall 'identity' of the organization – the connection between its culture, values and strategic process, technology and resource base – was able to integrate these new ideas about environment and sustainable development. In particular, this is seen in the company's predisposition to communication and partnerships.

Communication activities were important to SysTec. SysTec communicated its approach to the

environment with internal and external constituencies to share ideas with different stakeholders and gain their views. SysTec published educational leaflets on specific environmental issues, which affected the company and its industry in general. This was combined with public information sessions and displays together with environmentally related community projects to communicate the company's position and to raise environmental awareness.

The company's belief that it was 'part of the solution' to environmental problems meant it did not feel defensive about its environmental position and it also ensured that all sides of an environmental issue were addressed. Consequently, various environmental NGOs were encouraged to meet with the company to discuss concerns. The purpose of these meetings was not to give a '"dog and pony show" where we would tell them how wonderful we were and what we were doing' (interview I). Instead, environmental activists were invited to meet with a number of departmental directors to discuss what their groups were planning, their strategies for the future and how they saw the company's position developing. Before adopting this approach senior management, with the exception of environmental managers, had only met interest groups in adversarial settings, such as at regulatory hearings. The environment managers at SysTec played an important role in establishing the trust that enabled representatives of the stakeholder groups to meet together with departmental directors. One environmental manager said of these meetings

> It provides an opportunity for an outside group, not necessarily to see us as a black box but to see other places. It gives an opportunity for a lot of other people in . . . [SysTec] to hear first hand what a group is, instead of having it distilled through me. It gives them a chance to raise their own questions as well . . . (interview III).

This same manager described it as a mutual learning process where each side was able to explain their position. Critically he noted

> There'd be areas where we agree to agree and areas where we agree to disagree and areas where we have opportunities to work together and areas where we need to work together towards resolving our differences.

These meetings helped to replace stereotypes held about one another. In these stereotypes the business managers were portrayed as 'older men, with well pronounced bellies, smoking cigars', with environmentalists characterized as 'former hippies with torn blue jeans' (interview III). Outcomes of these meetings were that the company developed a better understanding of interest groups' expectations and a clearer picture of what stakeholders believed SysTec should be doing, if it were to meet its claim as part of the solution to society's environmental problems. Moreover, SysTec gleaned important insights into the philosophy and tactics adopted by environmental groups.

These activities reinforced SysTec's commitment to environmental concerns and enabled a wide range of external perspectives and values to be merged in their response to those concerns. This was strengthened by the company's emphasis on partnerships and collaborative initiatives.

Partnerships and collaborative initiatives were a significant part of SysTec's approach to sustainable development. SysTec actively engaged in collaborative initiatives with many of its stakeholders: the general public, interest groups, industry members and industry associations, research associations and universities, regulatory and governmental agencies and competitors. The rationale for these partnerships was the realization that the days of 'command and implement' management styles were over (interview III). SysTec increasingly recognized the need to find alternative ways to resolve issues of conflict.

Through more inclusive styles of management, they were able to gain a better understanding of the expectations of their customers, governments, regulators and special interest groups.

Aside from holding dialogue sessions with different interest groups, SysTec sponsored small environmental projects, such as the local zoo's 'adopt a pond programme' to complement community activities. SysTec also became an active supporter of Earth Day to educate the company's employees and customers about SysTec's environmental commitment.

Partnerships were a key mechanism for SysTec to promote the use of its products as the environmentally preferred choice and to develop technology that would support this goal. SysTec had no in-house, 'state of the art' research facility. Instead it had a relatively small technology and development (T&D) department, which focused on the development aspects of the continuum from 'basic research' to 'product development'. SysTec developed the capability to leverage its basic research needs through partnerships with external research organizations. Moreover, part of T&D's charge was to modify the products used by the company's customers by encouraging manufacturers to undertake technology development. If the technological base was missing, it promoted research to fill the gap. Consequently, SysTec was involved in a large number of research collaborations with local, national and international industry associations, research organizations and universities. It was involved in projects that spanned a variety of issues from industry specific technological concerns about operational equipment and their environmental implications, to more generic global environmental issues, such as climate change, involving basic research in, for example, atmospheric chemistry.

SysTec was actively involved in persuading other industry players to have greater involvement in environmentally related projects outside the industry's 'traditional' areas of research. The company spearheaded several industry association collaborative initiatives, such as a handbook of environmentally related, industry-wide research, an annual conference on environmental issues affecting the industry and environmental training. SysTec was a key contributor in the formulation of an industry level environmental research policy through its committee memberships. Senior personnel were assigned to multi-stakeholder collaborative initiatives: for example, a scheme to 'green' the city in which it had its headquarters, involving representatives of environmental groups, engineering firms, government, management consultancies and business.

SysTec had strong relationships with its regulators as well as government departments and agencies at municipal, provincial and national levels. The regulator required SysTec to take part in two collaborative initiatives. One explored ways of internalizing environmental costs in the industry, and the other encouraged demand-side management programmes to minimize environmental impacts. These initiatives also assumed the form of multi-stakeholder consultative and collaborative groups, which brought competitors, environmental interest groups, consumer groups and governmental representatives together to address their fundamental differences. This process compelled SysTec to rethink its approach to dealing with its stakeholders, with senior managers becoming aware that they could not force these processes, the details of the agenda or the outcomes that emerged. They saw the need to build consensus around shared understandings, with environmental groups demanding greater, more radical, action than most of the participating companies were prepared to undertake.

DISCUSSION

The findings from the study provide strong support for the importance of learning – action networks in the acquisition of new knowledge and the development of collaborative structures to bring about corporate environmental management and more sustainable forms of business activity, but, before discussing the characteristics of SysTec's approach to the development and acquisition of new environmental knowledge, it is important to address the overall embedding of environmental management thinking and practice in SysTec's existing processes as it adjusted to new environmental concerns and realities. It is also important to draw attention to the overall alignment between SysTec's values, strategic process and managerial attitudes, which provided organizational pre-conditions that influenced, and were influenced by, its emerging practice of environmental management. For example, SysTec operated around values that related to corporate citizenship and were widely accepted in the company. They were consistent with the company's open, participative strategic processes enabling environmental issues to be identified and addressed, and then incorporated within that process. The newly adopted environmental practices were informed by principles, such as environmental stewardship and responsibility and by openness to the ideas and contributions of

external stakeholders. These environmental management principles and processes were consistent with the pre-conditions at SysTec.

SysTec engaged in mutually iterative learning and change. For example, its organizational pre-conditions were adapted as a result of new environmental management ideas. Environmental management ideas were changed also in light of the now modified organizational pre-conditions. The overall openness to ideas easily permitted organizational learning and change to take place.

SysTec's strong commitment to learning, to specific corporate values and its process of strategic planning meant that its was readily able to undertake change, enabling SysTec to incorporate environmental management into its organizational routines. Many companies appear to have found this difficult. Yet, SysTec rapidly developed new knowledge not found in its existing repertoire or experience. In other words, SysTec was receptive to and capable of acquiring this new knowledge.

In particular, SysTec's managers' abilities to work with a range of new stakeholders simply extended the approach to collaboration which had been a part of its traditional way of operating in T&D or supply chain activities. In those areas, the partners with whom SysTec sought to learn and take action were new to most of the managers in the company necessitating learning. SysTec did not need to learn new ways to learn with others; it only had to adapt its established ways of learning to working with new partners.

Environmental managers were specifically responsible for bringing members of their wider networks of environmental interests into contact with a number of senior corporate managers and department heads. Rather than retaining these networks exclusively, the environmental managers sought to spread the knowledge from their networks widely into the internal corporate structure of SysTec.

These observations can be related to the literature on strategic bridging (Westley and Vredenburg, 1991), stakeholder networks (Rowley, 1997) and organizational resources (Hart, 1995). In the case of strategic bridges, as mechanisms that enable the exchange of environmental knowledge between organizations such as environmental groups and companies, the study of SysTec indicates the importance of establishing multiple bridges between people who work in different organizations. The metaphor of the strategic bridge, therefore, does not appear totally appropriate to the relationships found at SysTec. These are better represented as a rather fluid, network-like structure that involves learning and action by many people in the company and by many people and organizations in a company's 'stakeholder field'. SysTec was not involved in establishing a single 'strategic bridge'. It was engaged in developing multiple points of contact for learning and action. This 'strategic network' provides the ground within which more formal 'strategic bridges' could arise between stakeholders and different parts of the company. This implies that SysTec was simultaneously involved in the development of strategic bridges, as formal collaborations, and in advancing a less formal network of interactions between the company and its stakeholders, of the kind envisioned by Rowley (1997), but, in contrast to the emphasis Rowley places on the concepts of network density and organizational centrality, the experience at SysTec reveals the importance of organizational pre-conditions and interpersonal capabilities in developing the potential of the learning–action network as an organizational asset.

The study identifies the crucial role of environmental managers in facilitating the process of network development and as the architects of multiple bridges. This function was enhanced by the organizational support for the process of bridge building. This support, or legitimacy, derived from SysTec's longstanding values and approach to collaboration, which enabled SysTec's environmental managers to develop the space to build new bridges and broker new relationships. These then helped inform organizational processes such as strategic planning or T&D management.

The study of SysTec reinforces Roome's (1994) contention that environmental management and the environmental dimension of technology development require new, more open, mechanisms for collaboration and learning. It extends Hart's (1995) proposition that capabilities, in drawing external stakeholders into dialogue with the company, are an important asset for companies involved in environmental management, but, it contradicts his later suggestion that these mechanisms should be used to encourage learning

by stakeholders (Hart, 1997). Overall, the experience at SysTec identifies serious limitations with this view.

SysTec's experience shows that networks are not just for communicating a set of company messages to stakeholders. Instead they provided a mechanisms for mutual learning and action by the company (and its managers) and its stakeholders (organizations and individuals). This implies that learning is two way. For example, stakeholder inputs could lead to the revision of SysTec's corporate strategy or to the establishment of new multi-party business and environment initiatives. In this sense, SysTec's strategy did not define the nature and direction of collaboration with the company's network of stakeholders. As a consequence of the company's culture and attitudes SysTec's strategy was flexible and responsive to stakeholder issues and interests.

The study suggests a complex process of negotiation, learning, action and change between the company and its stakeholders was taking place to integrate environmental ideas into SysTec and to progress sustainable development. This involved the managers of the company and its dynamic network of stakeholders in a process of continuous mutual adjustment.

This process of learning and action is not simple. SysTec's networks with stakeholders were characteristic of its industry, technologies, organization, personnel, culture and history. Not only are these networks dynamic, they contain a diverse array of values, experiences, interests and ideas within which a myriad of contested interpretations of environmental and sustainable development concepts are played and acted out (Myerson and Rydin, 1996; Clarke, 1997). Often these differences are found in the specialized use of language within different (stakeholder) communities (Roome, 1997). This implies that those responsible for facilitating learning, action and change using networks must have the capability to bridge these different communities or islands of knowledge and language (Clarke, 1997). The capability of these boundary-spanners (Mylonadis, 1993) or network champions (Roome, 1997) or catalysts (Clarke, 1999) to promote learning, action and change through networks appears a critical, yet under-researched, aspect of environmental management and sustainable development practice. It is suggested that SysTec was assuming the character of a meta-textual, highly networked organization, engaged in the development of knowledge and collaborative action through interaction with many internal and external stakeholders as a way to bring about environmental management and sustainable development.

CONCLUSIONS

A number of conclusions are drawn from the case study. SysTec's acknowledged leadership in environmental management is traced to the context, business and established values that provide it with a set of organizational pre-conditions. The regulatory setting and the Canadian approach to multi-party dialogue create a context in which it is legitimate for businesses to forward environmental responsibilities. The resources supported this and technologies of SysTec's core business and enabled SysTec's positioning as environmentally friendly.

SysTec then drew on a number of internal pre-conditions that enabled it to learn and change to develop its environmental management capability and sustainable development potential. Important pre-conditions include the values the company operates by and its strategic processes, which identified environmental issues as a future strategic driver. This process was open, participative and flexible enough to adapt the organization to these concerns. SysTec's strategic planning process can be viewed as an organizational spiral, collecting issues from across the company, rather than the more narrowly defined, planned, hierarchical, closed process used by many organizations for strategic planning.

Proposition 1. Corporate effectiveness in developing responses to environmental concerns and sustainable development is critically influenced by context and organizational pre-conditions that pre-dispose an organization to mutual learning and change with other stakeholder groups. The internal process at SysTec supported increasingly close relationships with its customers, regulators and the communities in which it operated. This was supported by SysTec's willingness to be open, to view communication as listening as well as talking, to engage in many different opportunities to learn

and act together with a wide range of stakeholders and to broaden their points of contact within the company. SysTec was able to make effective use of a rich network of knowledge.

Proposition 2. Companies that are open and responsive to multiple perspectives are more disposed to acquire new knowledge and take actions that meet environmental management and sustainable development needs than those that develop knowledge and act within their existing resources. SysTec's environmental managers played an important role in facilitating settings in which learning was developed and translated into joint actions. They effectively bridged internal and external networks.

Proposition 3. Companies that acquire knowledge that contributes to effective environmental management and sustainable development have access to managers with highly developed networks, networking skills and capabilities in facilitating change through those networks. SysTec developed a learning – action network form of organization. This provided a frame or sounding board that influenced the company's ability to develop novel ways to meet challenges confronted in the economy, environment and society. Relevant networks provided feedback that enabled SysTec continuously to re-define the problems of environment and sustainable development and to shape and reshape its responses to old and new issues. It continues to provide opportunities for SysTec to act with stakeholders to address the fundamental changes in socio-technical context.

Proposition 4. Effective environmental management and sustainable development require companies to use networks of stakeholders as a means to inform, confirm and validate their approach to environmental management or sustainable development. Despite SysTec's acknowledged success in shaping its response to environment and sustainable development within its business, a number of issues remain. For example, there are questions about the extent to which SysTec was able to respond to the more far reaching demands of stakeholder networks and to develop collaborative initiatives and projects while respecting fundamental differences of perspective that could not yet be bridged. SysTec was also aware that it had to learn, act and negotiate with many different stakeholders, yet it had begun to encounter problems; in particular, SysTec's managers encountered contested meanings and values and problems over the different uses of language in the learning – action network. These problems were beginning to influence the implementation of joint projects.

Proposition 5. Effective environmental management and sustainable development involve inclusive networks for learning and action. The more inclusive a network is, the greater the demands on the 'process skills' of managers to reconcile the problems that stem from the difference of perspective and language used by network members. There was evidence that SysTec's competitors were beginning to imitate SysTec's programmes and activities rather than undertaking change in the organizational culture, attitudes and processes that provided the pre-conditions for SysTec's success. The case study suggests the need for all the strategic aspects of a company to be open to new knowledge and new opportunities for collaboration through the mechanism of learning – action networks. The challenge for corporate strategists, technology managers and environmental managers is to synchronize the 'soft inputs' from learning – action networks with more analytical skills of strategy formulation or technology development and management.

Proposition 6. Effective environmental management and sustainable development involve highly developed skills in facilitating inputs from multi-stakeholder networks at all levels of a company – strategic, environmental and technological as well as operational.

ACKNOWLEDGEMENT

The Authors would like to thank the Erivan K. Haub Program in Business and Environment, Schulich School of Business, York University, Canada, for its financial support of this research. The accuracy of the content of this paper remains the responsibility of the authors.

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