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**The Campus Environmental Management System
Cycle in Practice:
15 Years of Environmental Management, Education and Research at
Dalhousie University**

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Brief Autobiographical Note:

Amelia Clarke is a PhD student in the Faculty of Management at McGill University in Montreal, Canada. She is also a sessional lecturer in the McGill School of Environment. This case study is based on her Master's thesis, which was conducted while a student at the School for Resource and Environmental Studies at Dalhousie University. Her current research interests include: campus sustainability; regional sustainable development planning; and environmental policy implementation. Amelia Clarke is also the President of the Sierra Club of Canada, a Canadian environmental non-governmental organization that includes the Sierra Youth Coalition and its Canada-wide Sustainable Campus Program. She can be contacted at Amelia.Clarke@sierraclub.ca.

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The Campus Environmental Management System

Cycle in Practice:

15 Years of Environmental Management, Education and Research at Dalhousie University

Abstract

Purpose: To challenge the deliberate strategy approach of the environmental management system (EMS) cycle, and offer a model based on both the practical reality experienced at Dalhousie University and emergent strategy theory. Also, to share some of the lessons learned in the 15 years of environmental management at Dalhousie University.

Methodology: A case study of environmental management at Dalhousie University between 1990 and 2005 was conducted. Data was collected through 13 interviews with senior management and through 22 interviews with faculty, students and staff.

Findings: Two EMS cycles emerged with an overlap in the policy, planning and implementation phases, as well as unpredicted ‘*maintaining implementation*’ and ‘*renewing*’ phases. Emergent plans and best practices from other universities fed into the EMS cycle at the implementation and review stages, respectively.

Research Implications: An improved EMS model is presented. It includes feedback loops, emergent plans, unrealized plans, the renew concept, and best practices.

Practical Implications: Six practical lessons extracted from the case study are: ‘early movers’; champions; administrative versus academic versus joint environmental policies; opportunism; and, the change cycle. The sustaining and renewing phases that Dalhousie University

experienced are important for practitioners to be aware of. The case itself also presents an overview of numerous initiatives.

Value / Originality: Integrates strategic management and campus EMS theory to create a new model, while also outlining 15 years of environmental management and change cycles experienced at Dalhousie University.

Keywords: Environmental management system; university; Halifax, Canada.

Paper Types: Case study and Research paper

Introduction

In 1991, Dalhousie University hosted the Conference on University Action for Sustainable Development in which one of the outcomes was the Halifax Declaration (Jenks-Clarke, 1992). This declaration built upon the Talloires Declaration by adding an emphasis on action. While a study of the implementation of the Halifax Declaration determined that the majority of signatories have not implemented it within their institutions (Wright, 2002); Dalhousie University has maintained a vibrant environmental management effort, which has included continual improvements. In the last 15 years, since adopting its environmental policy in 1990, Dalhousie University has undergone almost two full cycles of an informal environmental management system.

In theory an environmental management system (EMS) involves a number of phases that sequentially follow one another. An organization begins with developing an environmental policy, plans for its implementation, implements the policy, checks the results, and reviews the plans and, at times, the policy. Then, the cycle begins again with another round of planning, implementing, checking, and reviewing (International Standards Organization, 1996). Strategic management theory challenges this deliberately planned approach and offers an explanation that explains realized versus unrealized strategy while including emergent ideas. Mintzberg's "Deliberate and Emergent Strategies" model shows that *intended strategy* turns into *deliberate strategy* and *unrealized strategy*. But that the *deliberate strategy* is joined by *numerous emergent strategy* initiatives resulting in *realized strategy* (Mintzberg, 1978, 1994). Andrews (1987) also explains that the separation of plan formation from implementation is a false and abstract separation for the purpose of analysis. Formation and implementation phases are interrelated in

real life (Andrews, 1987). When this strategic management theory is considered together with an EMS model, one would expect that the EMS model should include emergent strategy and unrealized strategy as part of the cycle.

In this article, a case study of 15 years of environmental management at Dalhousie University is used to demonstrate that a model with emergent strategy might be better suited to reality than the deliberate strategy approach of traditional EMS models. The article first introduces the methodology used to develop the case study. Then, a detailed description of the case is presented. The conclusions outline both: 1) lessons learned through the case that might be of relevance to campus environmental management practitioners, and 2) some implications for the theory of campus environmental management systems. A new model is presented that incorporates the reality documented at Dalhousie University and the theory suggested from strategic management literature.

Methods

Located in Halifax, Nova Scotia, a city of 350,000 on the east coast of Canada, Dalhousie University was founded in 1818. Located in Halifax's downtown, the campus is built upon 79 acres. The university attracts high achieving students from around the world. With a student base of 15,500 students, this university offers more than 3600 undergraduate, graduate, and professional courses in the Faculties of: Architecture and Planning; Arts and Social Sciences; Computer Science; Dentistry; Engineering; Graduate Studies; Health Professions; Law; Management; Medicine; and Science (Dalhousie University, 2005). As a signatory of the Halifax

Declaration in 1991, and a university that adopted its own environmental policy as far back as 1990, Dalhousie University has a long history of environmental management. Some initiatives pre-date 1990, but as the purpose of this paper is to focus on the components of an environmental management system, the starting point is with the first policy. As the policy adoption at Dalhousie University pre-dates formal environmental management systems, such as ISO 140001, and because Dalhousie University has chosen to keep their system informal, this study looks at the actual cycles of environmental management that occurred instead of what was formally planned to occur.

The method of data collection was conducted through an archival study of reports, websites, and academic literature. It was complemented by two sets of interviews that were undertaken with the Dalhousie University community to permit a cross-section of perspectives and experiences, in order to gather information on the past and current environmental management initiatives and systems. For this paper, they play the role of providing the content for the case study. One set was done with 13 senior administrators, senators, and board members (collectively referred to as senior management); while, the other interviewee set was made up of 22 staff, students, faculty, and managers. Throughout this article, content coming from a document was referenced; otherwise, the source came from an interview. The study covers all environmental management initiatives, including, in the areas of operations, finance, education, and research.

The environmental management initiatives were coded into topics such as education, research, energy, waste, etc. These were then synthesized into the traditional categories of an EMS (policy, planning, implementation, reviewing, and checking). As the chronology did not match

with the EMS phases that one would expect, instead, they were reordered chronologically so that the patterns of strategic management might emerge. As these patterns matched two distinct EMS cycles, the phases within the cycle were determined. This is presented in the case study that follows.

Case Study: Two Cycles of Environmental Management at Dalhousie University

The chronological history of environmental management at Dalhousie University can be seen in Table 1. The darker boxes indicate intense activity, while the lighter shaded boxes indicate sustained activity or a new initiative in only one topic area (such as waste). The blank boxes indicate no activity. There are two distinct cycles apparent from the table distinguished by a new policy or declaration. The first cycle clearly does not follow the pattern of EMS phases. Instead, there is an initial wave of simultaneously adopting a new policy and declaration, planning, and implementing new ideas all in two years; followed by six years of sustaining that implementation, with a short second wave of planning and implementing new initiatives in 1994. The first cycle ends with a checking, reviewing and renewing phase (1998 to 2000). The second cycle began after Dalhousie champions were aware of the formal EMS model, and follows a more sequential approach.

Table 1: Environmental Management System Timeline

| Year/ Phase | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 |
|---------------|------|------|-------|-------|------|-------|-------|-------|------|-------|-------|-------|-------|------|-------|-------|
| Policy | Dark | Dark | | | | | | | | Dark | Dark | | | | | |
| Plan | Dark | Dark | | | Dark | | | | | | Dark | Dark | | | | |
| Implement | | Dark | Light | Light | Dark | Light | Light | Light | Dark | Light | Light | Light | Light | Dark | Light | Light |
| Check | | | | Light | | | | | Dark | Dark | Dark | | | | | Dark |
| Review/ Renew | | | | | | | | | Dark | Dark | Dark | | | | | |

Cycle I - Phase I: Policy, Planning and Implementation (1990 – 1994)

The first phase, which could also be referred to as ‘*the start-up years*’, was at a time when the environment was a priority item for Canadians in general and Dalhousie University in particular. While the enthusiasm to create new environmental initiatives could be attributed to the times, it is more likely attributed to the fact that this was the beginning of something new, and people were excited. This was the time in which a number of initiatives were begun. The University Committee on the Environment (now the Senate Environment Committee) was created in the fall of 1990 (Bakker, 1998). Ten years earlier, in 1980, the university-wide Environmental Health and Safety Committee had also been created (Dalhousie, 2004).

Also in 1990, Dalhousie University adopted its environmental policy. The preamble describes the university's “special responsibility to conduct its activities in an environmentally sound manner” (Dalhousie University, 1990). Five specific areas are mentioned: academic choices, research, healthy environment, management of buildings, and grounds and operations. One interviewee reported with pride that during the early years, there was strong support from senior management. He said that the President sent a letter to every department informing them of the new policy, and asking them to develop initiatives towards its implementation.

In 1991, Dalhousie University hosted the Conference on University Action for Sustainable Development, where the President and Vice-Chancellor of Dalhousie University explained that, if a university is to provide environmental leadership, it must first set its own house in order (Jenks-Clarke, 1992; Thompson and van Bakel, 1995). One of the outcomes of the conference was the Halifax Declaration, which Dalhousie University immediately signed.

Howard Clark, then President of the University, was one of the champions in the original efforts, as were other faculty, student and administrative champions. In 1991, about 4% of the total water was saved through conservation initiatives. Waste recycling initiatives also began for paper and beverage containers (Dalhousie University, 2005). Energy efficiency campaigns were launched, as well as initiatives around indoor air quality, sulfur emissions controls, pesticide-free grounds, and hazardous waste disposal. In 1991, the university also created a campus plan which took into consideration issues around transportation and grounds environmental planning (Mackay-Lyons, 1991). It was at this point that a student group, as part of a class research project, created a guide to campus environmental auditing (Blok et al., 1991). Smith's *Campus Ecology*, became available in 1993 (Smith, 1993), so champions at Dalhousie University had to create their own campus greening tools.

In the areas of education and research, many new courses and research projects have been initiated. The majority of the environmental research takes place in the School of Resource and Environmental Studies (SRES), in Urban Planning, and in Environmental Engineering. In terms of teaching, environmental concentrations were added in the M.B.A., Law, Engineering, B.Sc., and Bachelor of Management programs, plus numerous individual courses throughout various disciplines, including a mandatory course for all engineering students.

Efforts to start integrating academic learning with campus operations began. Funding for a "Greening the Campus" type course was founded and piloted in 1993, with a university-wide waste audit (O'Connor, 1993). A biology class created a design for an ecological garden,

complete with a pond and native species (Vermeer, Shaw, and Aatre, 1994). This was sponsored by a local company, Ocean Ltd., and named the Ocean Pond, built as a demonstration micro-ecosystem (Baccardax, 2005). A professional development series on environmental education called DEEP (the faculty development program) was also held in 1994 and 1995 (Côté, 1999; Watson and McGuinness, 1994). Facilities Management started producing a short-lived newsletter called Ener-Action, which outlined some of the actions they had undertaken, and some energy conservation tips. Dalhousie faculty, the current VP Academic, and the previous president participated in the National Round Table on Environment and Economy (NRTEE) workshops on the topic of sustainability in higher education (NRTEE, 1995).

Dalhousie University's experience during these start-up years demonstrates that policy formation, planning and implementation can occur simultaneously, while emphasizing the importance of having a champion in senior management.

Cycle I - Phase II: Maintaining Implementation (1995 – 1998)

Around 1995, environmental management, education and research at Dalhousie University entered a new phase, which for the purpose of this paper is characterized as '*the sink or swim years*'. The University welcomed a new president in 1995, for whom environmental management was not a priority. Fiscal accountability became paramount, and no new initiatives were launched. Some initiatives from the previous phase ended, such as the DEEP faculty professional development, the campus Ener-Action newsletter, the "lights-off" campaign, and the "greening the campus" course (which was run by a Facilities Management staff). The university-wide environmental committee became almost defunct. While this trend matched the

political attitude towards environment in Canada at the time, other universities such as the University of British Columbia were just adopting their 1997 Sustainable Development Policy and launching their 1998 Campus Sustainability Office (Moore et al., 2005). Was it the change in presidents and the loss of a key champion that moved Dalhousie U. into the sink or swim years? Was it a shift by the university towards being fiscally prudent that created this move? Or, was it the fact that many initiatives had been launched so efforts were now being put into evaluating, maintaining and improving the most promising of those initiatives? Most likely, it was a combination of all three. Whatever the impetus, there was a distinct shift in efforts from planning and implementing towards maintaining and improving. In a formal EMS model, these types of unpredictable shifts are not accounted for; yet, in Dalhousie's case, the place in the cycle (implementation) remained somewhat the same.

For those champions who were still active, they focused on maintaining and improving the programs that had been put into place. The links between administrative initiatives and academic initiatives stopped, while most other things had progressed in their individual units. On the operations side, waste had been reduced by almost 50% compared to 1990 levels through diversion to recycling and organic composting (Murphy, 1998, 1999). Facilities Management did what they could with each building maintenance project. Energy initiatives were also undertaken (heat recovery, changing light fixtures, variable speed drives on motors). Facilities Management also automated energy management of some buildings enabling more control on scheduling, ventilation systems, and temperatures. In new buildings, the fittings installed were energy efficient. Custodial staff was switched to working days instead of nights, and an attempt was made to use cold-water instead of hot-water cleaning solutions.

Still, ongoing challenges with maintaining implementation existed (i.e., accessing sufficient funds for maintenance). Budgets are based on an annual basis, and in the late 90s, it was almost impossible to get funds for long-term payback projects. Cost savings resulted in budgets being cut the following year instead of creating revenue for future projects.

On the academic side, faculty continued developing the approved programs such as the mandatory environment course in the Bachelors of Management. Additionally, a faculty member did a report and two books on the university as a partner in international regional development, which reviewed research on sustainable development at Dalhousie University (McAllister, 1998). Students continued with their own initiatives and did not seem to be affected by the university-wide chill on new environmental initiatives, perhaps, due to the arrival of new champions that were not imbedded in the existing initiatives.

EMS literature rarely discusses *'the sink or swim years'*, yet at Dalhousie U. the improvement feedback loop allowing incremental modifications to existing initiatives was a reality. Once a champion had launched his/her initiative(s) in phase I, his/her efforts in phase II focused on institutionalizing them, an important step that takes time and effort and limits the implementation of new initiatives without a new champion.

Cycle I - Phase III: Checking, Reviewing, and Renewing (1998 – 2000)

In 1998, champions at Dalhousie University decided to reinvigorate efforts by reconstituting the university-wide environment committee. Efforts turned to assessments of achievements to date,

and an analysis of other universities' initiatives (Bakker, 1998). There were several audits conducted in the areas of solid waste composition and paper consumption (Clarke and Campbell, 2001a). There was also some monitoring done on air emissions, water use, energy use, hazardous waste disposal, and solid waste disposal, by the unit responsible for the implementation. Also, the Association of University Leaders for a Sustainable Future's Sustainability Assessment Questionnaire was conducted. The approach was not systematic or based on the environmental policy per se; in other words, it was not so formal as to be a comprehensive environmental assessment or audit, such as those that were beginning at other universities at about this time (Mount Allison University, 1999). That might in part be due to the fact that this committee had no access to funds or specific staff support, so unlike other schools, which started hiring students to do audits, Dalhousie was limited to the efforts of their committee members and existing responsible units. The trend continued with an emphasis on monitoring efforts linked to the champions' interests.

Certain areas from the original environmental policy had not been realized. There had been little or no initiative on operational environmental interactions such as wastewater treatment, organic food purchasing, environmental friendly transportation, and ecological building design. Paper purchasing and consumption is another environmental interaction on which little conservation effort was put. Despite efforts being placed on using double-sided copies as the default in the print shops, and reducing the number of student calendars, the university nevertheless used 43,106,813 sheets of photocopy paper (Clarke et al., 2001a) in 1999.

Other topics, which were starting to be considered on other campuses, were not included in

Dalhousie University's original environmental policy. That did not stop champions from checking these best practice ideas for their implementation at Dalhousie University. Indirect environmental implications of financial decisions, (e.g., paper procurement) started to enter discussions. Some corporate funding was accepted from sources that could be questioned for both environmental and social reasons, such as genetically modified tree research (Hirtle, 1999). Then and now, sustainability considerations in the investments of the university are non-existent.

The informal review period determined that part of the problem in implementing the environmental policy was that there was no one responsible unit. Unlike many other leading schools, Dalhousie U. did not set up one environment office or sustainability office and officer in the late 1990s, based on the fiscal restraints argument.

Discussions at the committee level turned to 'how to reinvigorate the interest of senior management', and 'how to move the university towards the best practices that were starting to appear at other schools'. In 1999, the president of Dalhousie University signed the Talloires Declaration and the Declaration of Cleaner Production in January 2000 (Murchland, 2000). The Senate Environment Committee then began to revise the current university environmental policy to reflect current thinking around environmental management systems, as well as to add a section on finance (procurement, and investment). The successful efforts by Dalhousie University champions to renew the attention on environmental management by both senior management and the campus as a whole, is an interesting twist in the EMS cycle. At this point, the second cycle began.

Cycle II - Phase I: Revised Policy, Planning and Implementation (1999 – 2004)

While the assessment of best practices at other universities began in about 1998, and the seeds for what might be called ‘*the isomorphism years*’ were planted in the last phase. These years were focused on policy revision, planning and implementing based on best practices from other universities. Dalhousie University co-hosted the national SYC Sustainable Campus Conference in 2001, where best practices from across North America were highlighted. While the Senate did not pass the newly drafted environmental policy (with its proactive statements on the ecological literacy of ALL students, and ethical investment), senior management did turn its thoughts to environmental programs again, thus allowing new initiatives to begin. The university approved the development of a much-expanded Environmental Science and Studies Program for undergraduate students, and created a new environmental award program. Waste management also expanded to include organics (Dalhousie University, 2005).

In 1999, the university expanded its organics collection of leaves to include food. This timed with the adoption of a solid waste Halifax bylaw that banned organics from the landfill. The award-winning hazardous waste program continues. One student produced a Green Challenge guide for waste, water and energy reduction in residences (Angus, 2000) which has since been used in friendly inter-residence competitions.

In terms of other operations, all electricity is purchased through Nova Scotia Power, a company that is slowly expanding its renewable energy percentage. Regarding metering, Facilities Management designed and set-up a software package that allows them to check bills and abnormal usage, thereby reducing electricity usage. Staff in Facilities Management also attend

professional development courses. The University does produce its own heat by burning Bunker C, and there have been a number of studies on the potential for co-generation.

Environmental initiatives were also begun in the area of procurement. The Inter-University Services (ISI) is the joint buyers' group among Atlantic Canada universities. ISI, under Dalhousie's encouragement, adopted an Environmentally Aware Procurement Policy in 2000 (Inter-University Services Inc, 2000). The Senate Environment Committee also drafted a purchasing policy for the university itself, and a new champion joined the efforts from the purchasing office.

The Senate Environment Committee struck an Environmental Policy Implementation Plan Sub-Committee in 2001. This sub-committee conducted a Delphi study, a public meeting, and a questionnaire to solicit input on a strategy for environmental management at Dalhousie University (Clarke, Wright, Elson, and Green, 2001b). The strategy was presented to Senate, with the proposed updated policy in 2002, receiving extensive feedback and suggestions for revision (Dalhousie University – SEC, 2002; Dalhousie University, 2005).

In the fall of 2000 and 2001, students in a Master's level course also held public consultations on environmental management at Dalhousie. In the latter year, focus was placed on creating an ecological design for the new Management building. Three Masters' theses were also conducted on related topics: greening procurement (Gardiner, 2001), ecological transportation options (Sodero, 2001), and campus environmental management systems (Clarke, 2002). Recently, undergraduate environmental programmes have been expanded (Dalhousie University, 2005). As

one interviewee commented, “I think that one of the main catalysts has been the new environmental studies major, which has attracted people keen about sustainability and also been a source of motivation, and inspired education on sustainability for many students”.

The former DEEP program was renewed in 2004 as an annual research symposium called DEEP-R (Dalhousie Environmental Educators, Practitioners and Researchers), which involved 17 different departments. The Senate also created an environment award which, in 2005, was presented to the three faculty members who organized the DEEP- R (Dalhousie University, 2005).

There are a dozen or so environmental related student societies on campus. Students successfully negotiated a universal bus pass for the campus, and the student union is working to create a sustainability position. One of the graduate student groups also initiated a sustainability pledge for graduates, while another launched an online student journal called Green Perspectives.

Cycle II – Phase II: Maintaining Implementation and Checking (2004 – 2005)

While implementation continues to be maintained on initiatives begun in the past 14 years, new efforts on campus now focus on audits, assessments and reporting. In other words, Dalhousie University is now in a *checking* phase. The isomorphism that occurred in Phase I of Cycle II continues. The university has joined the Canadian movement to use the Campus Sustainability Assessment Framework.

Environmental health and safety related matters have ongoing monitoring that is reported in an annual report. ChemEx is a chemical exchange program that allows chemicals that are of no use to one researcher to be given to another. Since its initiation in 1992 until 2003, over 6114 chemicals have been exchanged, amounting to a \$320,000 savings (Dalhousie University, 2004). The Facilities Management also has ongoing monitoring of solid waste. In the year 2004, a diversion rate of 32% for solid waste (not including hazardous waste) was achieved (Dalhousie University, 2005).

Three student groups started a Sustainable Dalhousie Project with the support from the Sierra Youth Coalition (SYC). This project involves doing a comprehensive campus assessment using the SYC's popular Canada-wide Campus Sustainability Assessment Framework. The SYC Greenhouse Gas Inventory has also been incorporated, and a multi-stakeholder committee is being formed to work with both of these initiatives (Sierra Youth Coalition, 2005; Howe, 2005).

Table II summarizes the state of Dalhousie University's environment by topic area. This table demonstrates the areas in which environmental management has occurred.

Table II: Summary of Environment Management at Dalhousie University

| | Interaction | State of Environment at Dalhousie University |
|----------|---------------------------------|---|
| | EMS – Policy, Plan and Checking | Campus-wide Environment Committee (1990); Environmental Policy (1990); Draft Revised Environmental Policy (2002); Strategy for Environmental Policy Implementation (2002); Numerous unit level audits, assessments, and monitoring (1992 onwards); Comprehensive assessment (2005). |
| Academic | Research | School for Resource and Environmental Studies graduate students and professors; Many other departments with specific environmental research; Some research done at University is potentially contrary to sustainability; Dalhousie Environmental Educators, Practitioners and Researchers annual research symposium DEEP- R with 200 participants (2004). |

| | | |
|-------------|-------------------------------|--|
| | Education | Dalhousie Environmental Education Program for faculty development (1994, 1995); Optional environmental courses in most degrees, mandatory in Bachelors of Management and Engineering; Some environmental degree options (Engineering, Law, Management, Science, Studies, etc.). |
| | Communications | Dal News, Gazette, and various local, regional, and national coverage; Promotional video on waste management course (1993); Web sites of environmental efforts in numerous responsible units. |
| | Community | Various programs linked with local and/or international communities. |
| Operational | Water | 234,767,000 gallons/year (1998) 40 million L saved (1991). |
| | Waste Water | Handled by the Halifax Regional Municipality. |
| | Solid Waste | Garbage = 1,333.19 tonnes (2004); Recycling = 441.98 tonnes paper; 15.73 tonnes beverage containers; 166.25 tonnes of organics (2004). |
| | Hazardous Waste | Chemicals: 8600 kg (2003); Exchanged: 6114 chemicals with \$320,000 saved (1992 to 2003); Battery recycling collection: 1101 kg (2003); Compressed gas cylinders recycled: 1510 kg (2003); Paint: 120 kg (2003); Glass: 918 kg; Metals: 30 kg; (2003); Emergency response system. |
| | Energy (Heat and Electricity) | 45,761,343 KWh / year (1998); 10,000,000 L Bunker C oil / year (1998); 917,922 L Furnace oil / year (1998). |
| | Air Quality | Scent-Free Policy and program; No-Smoking Policy for anywhere indoors; Scrubbers on smoke stacks. |
| | Grounds | No pesticides used, and integrated pest management; Community garden; Native species pond and ecological garden design (Ocean Pond). |
| | Buildings | New buildings and new maintenance focuses on energy efficiency. |
| | Food | Graduate House serves fair-trade organic coffee. |
| | Paper | 43,000,000 sheets in printers and photocopiers = 3,368 sheets / student (2000) not including calendars or newsprint or paper purchased off campus; 90% of paper is chlorine bleached and no recycled content (2000); Double-sided default for printing services. |
| Financial | Procurement | Draft Environmental Procurement Policy (2000); Inter-University ISI Environmental Policy; \$35 million spent each year. |
| | Investment | No social or environmental filters in decision-making for investments or endowments; No ethical options for pension plans. |
| | Funding | No social or environmental filters in accepting funds. |

Source: based on (Clarke et al., 2001b; Dalhousie University, 2005)

Possible Future Directions

While a strategy document exists outlining a possible implementation plan for the revised environmental policy, for the purpose of this case, only a few areas are included in Table III.

These suggestions are more oriented to the environmental management system process and structure than the implementation of the content.

Table III: Summary of Possible Future Directions

| Number | Possible Future Directions | Brief Outline |
|---------------|---|--|
| 1 | Responsible Unit | Delegating the policy implementation oversight to one responsible unit, and staff that unit with at least one environmental officer. |
| 2 | One or Two Policies | Considering whether one policy is best, or if administrative and academic functions should be separated. |
| 3 | Awareness, Training and Communication | Expanding and consolidating informal awareness including a central web site with reports and links. |
| 4 | Management System with Targets and a Strategy | Adopting a strategy, so that there are targets to audit against, even if emergent plans still exist. |
| 5 | Comprehensive Assessment | Continuing to participate in the comprehensive assessment. |

1) Responsible Unit:

Creating or determining an individual or unit responsible to oversee the environmental policy implementation is critical. Herremans and Allwright suggested that a full-time staff, commitment, communication, defined authority, audits, and capability from people, information, finances and equipment are all components of a successful EMS (Herremans and Allwright, 2000). There is currently no one person responsible to ensure policy implementation at Dalhousie University, a core reason for weaknesses in comprehensive and systematic environmental management in the past.

2) One or Two Policies:

The new draft environmental policy and strategy has become a working document. There was a suggestion by a top manager that there be two separate policies for operations and ecological literacy / research. Most universities in Canada, including Dalhousie's original policy, have

merged them (Wright, 2002). Separating them might allow for an easier development of two separate implementation plans, reporting structures, and responsibilities.

There was also a suggestion that the Senate Environmental Committee become a joint Board and Senate Committee, thus allowing for the same group of interested people to advise and monitor both academic and administrative matters. The Senate Environmental Committee currently spends more time on administrative matters than academic, which is a challenge, given the current membership and its location under Senate whose jurisdiction is over academic matters. Changing its structure would solve/ease its current dilemma by allowing the committee to also report to the Board, and allow the entire membership of the committee to be full voting members.

3) Awareness, Training and Communication:

The Board, Senate, and responsible committee(s) should also receive some kind of training on environmental management systems, since the interview results showed that only six of eleven top management had heard of the concept. In the literature review, Allen's process model states that decision-makers must be educated on an ongoing basis (Allen, 1999). Informal education of the community on environmental issues is a topic for which no one currently has responsibility. Besides the training and informal education, having one website from which to link all the other initiatives is an important future direction. Currently, each champion posts their content on their own website, but it is not linked with the rest. While there are links between some of the administrative sites and between some of the academic sites, they do not cross the divide, and they are not comprehensive. Moreover, some topics are not shared online at all.

4) Management System with Targets and a Strategy:

The University of Strathclyde asks each department to create its own plan based on the manual provided by the university (Noeke, 2000). The University of Strathclyde, which was en route to certification in the British Standards EMS, focused heavily on documentation (Noeke, 2000). It used one environmental management manual per department, and each department compiles its own reports and records. Each department develops its own baseline statistics and works for continual improvement. The Hochschule Zittau/Gorlitz University of Applied Science has an extensive electronic documenting system which compiles the unit level standardized data into a larger database (Delakowitz and Hoffmann, 2000). Departmental responsibility would increase implementation and checking. The first step for Dalhousie University though is to formally adopt some targets and a strategy. As is shown in this article, this deliberate plan will end up evolving with emergent plans joining, but it is important to commit to targets and timelines so they can be assessed. Evaluating for improvement is not sufficient.

5) Comprehensive Assessment:

At the 2003 Cleaner Production and Pollution Prevention Conference in Hermosillo, Mexico, participants commented on the need for an inexpensive peer external system audit process for higher education institutions. One interviewee commented that the Association of Higher Education Facilities Officers has such a system, though not specific to environmental auditing, and not on a regularly scheduled basis. Sierra Youth Coalition's Campus Sustainability Assessment Framework is at least providing common indicators that are being assessed on campuses across Canada. The future direction of Dalhousie University includes completing this

assessment and the Greenhouse Gas Inventory assessment.

Overall, Dalhousie University has an impressive record on environmental management over the last 15 years. It remains to be seen if the completion of the second cycle will require another effort to renew senior management's interest. It also remains to be seen if a third cycle will begin with another declaration or the adoption of the draft updated policy. The experiences of the past 15 years are rich with lessons that can improve both EMS theory and practice.

Conclusions

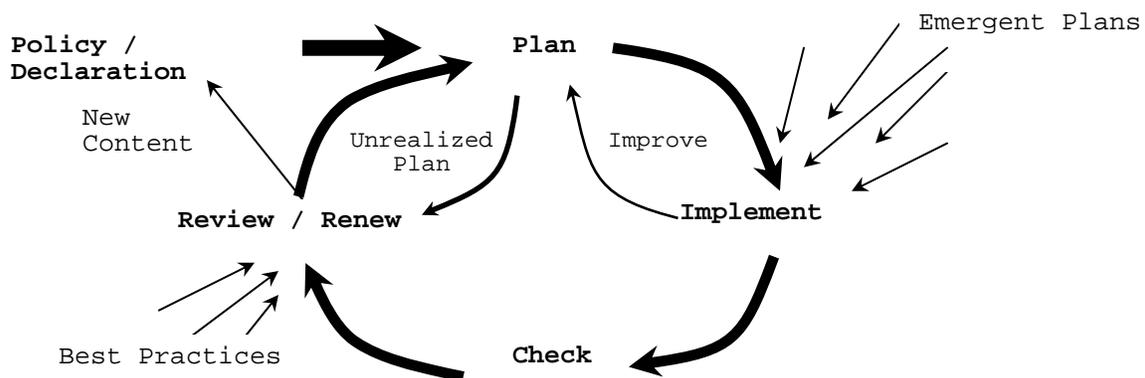
Campus Environmental Management System Cycle

As mentioned in the introduction, in theory, an environmental management system (EMS) involves a number of phases that sequentially follow one another. Mintzberg's (1978, 1994) emergent strategy theory, and Andrews (1987) notion that planning and implementation are interrelated phases, challenges the current EMS cycle. When these strategic management theories are considered together with an EMS model, one would expect that the EMS model should include emergent strategy and unrealized strategy as part of the cycle, and that the planning and implementation phases are a false separation.

Diagram I shows the environmental management system cycle modified to include these concepts. The unrealized plan is acknowledged, and an arrow redirects that to the review part of the cycle. As noted in the case, the first review of the Dalhousie University environmental policy in 1999 showed that whole topic areas had not been implemented. The emergent plans are

included as a series of lines feeding into the implementation. Two examples of emergent plans are the environmental purchasing policy and the composting initiatives. Also best practice ideas feed into the review phase, as not all ideas come from the policy or checking phases. Best practices from the literature are responsible for Dalhousie University champions desiring one responsible unit, and for their inclusion of environmental management system components in the strategy for environmental policy implementation. Finally, the improve arrow leads back from Implement to Plan without going through the check and review phase. This case study showed that in each cycle the new initiatives planning and implementing happened simultaneously while people were excited and engaged. Then there was a movement back and forth between planning and implementing as the programs and initiatives were improved. As is shown in Table I, the maintaining of implementation never stops, even when being checked.

Diagram I: Environmental Management System Cycle with Emergent Content



Seeing a diagram such as the one presented here should help practitioners be more aware of what to expect in reality, even as they try to design the deliberate environmental management system.

Both deliberate and emergent plans are needed for a truly functioning EMS.

Lessons Learned

The following are six lessons learned through the Dalhousie University experience.

1. Early movers have advantages and disadvantages. It is certainly an achievement to be the innovators of new programs, but the disadvantage is that more effort is needed to create than improve initiatives. Dalhousie University's effort to develop an audit framework in 1991 is an example of where early mover efforts went into developing tools instead of using them.
2. Champions are needed for each area of implementation and for the overall EMS as only the topics with a champion are implemented. Once a champion has implemented his/her idea, his/her effort goes into sustaining and improving it. New champions are needed for new initiatives; they can be new to the school or just new to the environmental effort.
3. Consider having two environmental policies – one for administrative functions and one for academic functions. While this may have its problems, recognizing the decision-making structure of an academic institution will likely allow for greater implementation. There were definite limitations to having a policy with operational content as the Senate's responsibility.
4. New opportunities are as important as the planned cycle, so allow for emergent strategy. For example, the impending provincial legislation on composting was definitely helpful in allowing resources from Facilities Management to be put into waste diversion of organics.
5. Cycles of change exist even when they are not planned for. Also ensure a renewing effort when entering a new cycle. What is not apparent in many EMS cycles is the need to renew interest in environmental management during the review phase. Not all senior-management follow environmental initiatives on an ongoing basis, but they are needed at various points in the cycle. The idea of having the university sign two new declarations and revamp the

committee structure was very helpful in creating the excitement needed for a new cycle and support for new initiatives. It is crucial to acknowledge that the sustaining and improving of existing initiatives is also very important when entering a new cycle.

6. Despite not having published much about their experience, or publicly broadcast their initiatives through one central website, Dalhousie University has 15 years of impressive implementation that involves two cycles of informal environmental management. One might also deduce from their experience that 5 to 7 years is about the correct timeframe for a complete cycle, though this overlaps slightly with the next cycle.

In conclusion, there are lessons learned through this case that are of relevance to campus environmental management practitioners. There are also some implications for the theory of campus environmental management systems. A new model is presented that incorporates the reality documented at Dalhousie University and the theory suggested from Strategy literature. Through the case study of 15 years of environmental management at Dalhousie University, this article demonstrates that a model with emergent strategy and best practice inputs might be better suited to the practice than the deliberate strategy approach of traditional EMS models.

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