Course Syllabi

- *Strategies for Environmental Management*
  Stuart Hart, University of Michigan
- *Pollution Prevention (P2) Management and Policy*
  Douglas Lober, Duke University
- *Environmental Consulting and Entrepreneurship*
  Alfie Marcus, University of Minnesota
- *Environmental Quality and Economic Advantage*
  Forest Reinhardt, Harvard University

BGS 3019/8019

ENVIRONMENTAL CONSULTING AND ENTREPRENEURSHIP: OPPORTUNITIES FOR BUSINESS

Professor Alfred Marcus
624-2812 or amarcus @csom.umn.edu

Visiting Professor: Brett Smith
Teaching Assistant: Rob Gutowsky

HHH 25
Thurs. 5:30-9:00

Background. Environmental businesses are growing rapidly. The worldwide market for environmental goods and services is estimated to be $300 billion. Spending on environmental protection is approaching 2 percent of GNP in the world's advanced industrial countries. For some multinationals, these advances pose severe adjustment problems. For others, they present opportunities for business growth.

Consultants and those with talents for new business development are in demand. An area of growing attention is strategic environmental management, where companies discover how to add value to customers through the creation of environmentally friendly businesses and products and through waste minization efforts that lower costs. The aim is win-win: gains for the environment and business.

Objective. The course purpose is to introduce you to this new field and provide you with consulting and business startup skills you will need to particpate in it. You will learn how to analyze environmental challenges and how to respond to these challenges. The challenges include the business opportunities created by environmental issues; how firms in established industries have to respond to demands that they introduce alternative products; and how companies learn from the experiences of each other about such topics as pollution prevention and accident reduction.

Group and Individual Assignments. You will develop the capacity to assess and respond to environmental challenges as you would in actual consulting settings where you are likely to work in groups. Be ready to actively participate in group assignments. Groups memos will be prepared that are addressed to a client. The memos should have: (i) an introductory paragraph; (ii) a section on the challenges the organization faces; (iii) a section on the responses the client can make including an evaluation of the responses and a suggested course of action; and (iv) a concluding paragraph restating the argument and admitting remaining uncertainties.

Each student also will write a paper, the assignment being to profile an environmental, energy conservation, or alternative energy business. You should interview at least one high-level and knowledgeable employee in the business and gather written material about it. More information about this assignment can be found at the end of the syllabus.

Grading.		
	class participation =	10 pts
	group memos (8) =	40 pts
	final paper =	50 pts
		100 pts.

Readings. Most of the required cases can be found in R.Buchholz, A.Marcus, and J.Post (BMP), *Managing Environmental Issues;* there also is a required reading package (RP) with additional cases. Optional background readings can be found in N.Vig and M.Kraft (VK), *Environmental Policy in the 1990s,* and A. Marcus (AM), *Controversial Issues in Energy Policy,* Sage Press, 1992.

Format

*Nearly every week, there will be outside speakers who are involved in environmental consulting or startups or who have shaped the conditions for business success in these areas.

*After hearing short presentations by the outside speakers and engaging in dialogue with them, we will divide into our groups for discussion of the cases.

*Case discussion in the groups will be followed by a short presentation by one of the groups of its analysis and recommendations. The class will discuss and critique the analysis.

*Each group will then hand in its analysis of the case on the following week.

Class Schedule

I. INTRODUCTION

January 4

speakers: Karin Nelson, Minnesota Trade Office; Julie Ball, MEI Energy Alley; Chris Cloutier, Office of Environmental Assistance

organizational meeting
--explaining the framework of the course
--dividing into groups
--explaining the paper assignment
--providing students with a list of companies they can contact

II. SETTING THE AGENDA

January 11

A. Environmentalists

speakers: Lisa Doerr, Citizens for a Better Environment; Bob Karls, Delta Environmental.

case: BMP, "Delta Environmental and the Advance of the Greens"

problem: Delta has to decide if and how to establish a presence in Europe. In light of the growth of the environmental movement on that continent, what are the prospects for the growth of environmental business? How should Delta proceed?

background reading:

BMP, "Changing Perspectives on the Environment"
VK, "After the Movement: Environmental Activism in the 1990s" and "Environmental Policy and Management in the European Community"

January 18

B. Government

speakers: Lisa Thorvig, MPCA; Lee Paddock, Minnesota Attorney General's Office.

case: BMP, "The Auto Emissions Debate"

problem: Unlike the other U.S. auto manufacturers, General Motors (GM) had invested large sums of money in catalytic converters to protect the public from automotive air pollution. Congress was considering extending the deadline for the introduction of catalysts. What should GM do?

background reading:

BMP, "Public Policy, Economics, and the Environment"
VK, "Environmental Policy from the 70s to the 90s," "A New Federalism," & "The Clenched Fist and Open Hand: Into the 1990s at EPA"

II. ADDING VALUE TO CUSTOMERS

January 25

A.Environmentally-Friendly Marketing

speakers: Mike Carlson, Minnesota Power; Ed Palmer, Solar Attic.

case: BMP, "ARCO Solar, Inc."

problem: ARCO must decide how to bolster the profitability of its solar products division. If it could not raise ARCO Solar's profitability, it would have to consider selling the business.

background reading:

AM, "Part I and Part II"
VK, "The New Environmental Agenda"

February 1

B.Portfolio Management

speakers: James Persoon, Alliant Tech; Kevin Krueger, Loral.

case: BMP, "1990 Clean Air Act and DuPont"

problem: The 1990 Clean Air Act affects nearly all of DuPont's businesses. It must decide how to realign this businesses in light of this landmark new legislation.

background reading:

BMP, "Business and the 'New Environmentalism'"
BMP, "DuPont Freon Products Division"
VK, "Environmental Gridlock: Searching for Consensus in Congress"

February 8

C. New Business Development

speakers: Carter Kuehn, Bioforce; Keith Thorndyke, Recycle Lights; Katy Boone, private consultant.

case: BMP, "Marine Shale Processors, Inc."

problem: Marine Shale Processors had apparently developed a superior method of disposing of hazardous wastes but was having many difficulties gaining its acceptance for its product. What should it do?

background reading:

VK, "The NIMBY Syndrome"

February 15

D.Pollution Prevention: Assessing Risk

speakers: Ken Sexton, U-Minn Public Health; Rolph Nordstrom, Environmental Quality Board.

case: BMP, "Polaroid's Toxic Use and Waste Reduction Program"

problem: Polaroid was having difficulties implementing its new P2 policies. Why? How could it overcome these problems?

background reading:

VK, "Risk Based Decision Making" and "Environmental Policy in the Courts"

February 22

E.Overcoming the Barriers to Effective Waste Reduction

speakers: Cindy McComas, MNTap; Al Aspergen, 3M.

case: BMP, "Dow Chemical: Environmental Policy and Practice"

problem: Dow had a successful waste reduction program. Why? How could it improve even more?

III. PREVENTING LOSSES TO INVESTORS

Feb 29

A. Managing and Avoiding Crises

speakers: Gary Olmstead, General Mills; Rita Meyer, Burlington Northern.

case: BMP, "The Big Spill"

problem: Exxon has just experienced the Valdez oil spill. What should it learn from this accident?

background reading:

BMP, "Ashland Oil Tank Collapse"
VK, "Environmental Values and Public Policy"

IV. MAKING THE SYSTEM WORK BETTER

March 7

A. Environmental Partnerships and Incentives

speakers: John Wells, EQB; David Morris, Citizens for Local Self-Reliance; David Wefring, 3M.

background reading:

VK, "Evaluating Env'tal Policy: Success and Failure" & "Economics, Incentives, and Env'tal Regulation"

March 14

final papers due

PAPER ASSIGNMENT:

Profiling an Environmental, Energy Conseration, or Alternative Energy Firm

A premise of this course is that environmental challenges not only create problems for companies. They also offer opportunities. Indeed, Minnesota, like other states have a large group of companies that exist because of the need to deal with environmental problems.

For this assignment, you are to interview and gather material about 1 of these companies.
You should send a letter similar to the one found below. After the letter is sent, you should contact a high level person at the company directly by telephone and arrange for an interview. Not all companies will be willing to cooperate, so you will need a backup in case the first company you deal with falls through.

SAMPLE LETTER

date

Dear _____,

I am a business student at the University of Minnesota taking a course in Comparative Environmental Policy. The course assignment is to do a paper profiling a firm in environmental, energy conservation, or alternative energy businesses.

I would like to interview an employee in your firm for the purposes of this assignment. I will need about 1.5 hours of the employees time. I will ask questions about: the nature of your business; the start-up and performance of the company; the industry of which the company is a part; and your long range plans for the company. The interviews can be conducted in-person or over the phone.

I would like to assure you of total confidentiality. The interviews I conduct will be off-the-record. I will not directly quote the people I interview. I will not report what I learn to other companies. Before handing in my assigment to Professor Marcus, I will let you review what I have written.

I will call you in the next couple of days to ask if you would be willing to participate. Based on your suggestions, I will then try to arrange a time and place to talk to you or some other knowledgeable person in your company.

If you have questions and would like to speak to Professor Marcus directly, his number is 612-624-2812.

Thank you for helping me in my efforts.

Sincerely,

The interviews can be conducted in person or over the phone. The interview guide is long. You may have to **modify it** to meet your needs and the needs of the person you are interviewing. The interview may take more than a session to get through. Remember that these are busy people. If necessay, you can call back or visit again to complete the interview.

Don't be rigid. Go with the interview flow. Ask additional questions when they seem important, and drop questions if they don't add value, or have been covered.

You should record the answers to the questions you ask by taking notes or taping. Some of the people you interview may not want to be taped. Be careful that in this and other ways you respect their wishes.

Assuring confidentiality. You should assure the people you interview of total confidentiality. The interviews are off-the-record. You will not directly quote the people you interview. You will not report sensitize business information to people in other U.S. companies with whom they might be competing.

The questionnaire. You should ask the people you interview the following questions:

Nature of the Business
1. What is the nature of your business?
2. What do you sell? To whom?

Goals
3. What are your goals for this company?

Motivation
4. What motivated you to become involved in this type of business?

Experience
5. How old is the company?
6. How long have you been involved in this field?
7. How long have you been involved with the company?

Start-Up
8. How did the company get started?
9. What are the obstacles it had to overcome to get started?
10. How were these obstacles overcome?

Size
11. How large is the company? How many employees does it now have?
12. What is the dollar value of last years sales?
13. How fast has the company been growing?

Performance
14. What were its profits (or losses) last year?
15. How well has the company done over time?
16. Is there some written material about the company's economic performance that we can have?

The Industry -- Competitors
17. How would you define the industry in which the company operates?
18. Who are its main competitors?
19. What niche does the company occupy?
20. What niches do the competitors occupy?
21. How well are the competitors doing?

The Industry -- Collaborators
22. With what other environmentally-related businesses does the company collaborate (e.g. suppliers)?
23. What complementary services or products do they provide?
24. How well are the collaborators doing?

The Industry -- Professional Societies, Trade Associations, and Other Groups
25. What professional societies and trade associations are important to this company?
26. What services do they provide? Which of these services do you use?
28. Would you briefly evaluate the effectiveness of these groups? What is missing, what services are they not providing?
29. What about environmental and other advocacy groups -- to what extent does the company work together with them, or pay attention to their activities?

30. Are there other groups -- for example, the Minnesota Environmental Initiative, foundations, the university -- upon which you rely? Could you briefly describe these groups and what services you get from them?

Government

31. How important are various government policies -- in particular regulatory and tax -- to the development of your company?
32. Try to think of other ways that government affects your business (e.g. government purchasing, technical assistance, product standards, R.D. expenditures, environmental education, job training, etc.) Could you categorize the different government programs that have an impact and describe how they affect your business?
33. Which of the government programs has your company used? How satisfied have you been?
34. To what extent would you like to see existing government policies changed? 35. To what extent is your company active in promoting such changes?
36. What effect would the changes, if realized, have on your business?
37. How likely are such changes?

Long-Range Plans

38. Does your company have a written plan? Can you share a copy of this plan with us?
39. How would you describe its long term plans?
40. What are the obstacles that it will have to overcome for it to realize its plans?
41. How are you planning to overcome these obstacles?

Current Problems

42. What are the most important problems that the company currently faces?
43. What is it doing to solve these problems?

Future Markets

44. Can you describe the nature of your future markets?
    Are they:
    a. primarily local?
    b. mainly regional?
    c. national (domestic U.S.)?
    d. international?
45. What type of market research (if any) you are doing?
46. What else are you doing to expand the company's business?

International Opportunities

47. Do you see any international opportunities for your business?
48. In what part of the world do you see these opportunities?
49. Can you describe the current plans you have for international expansion?

Thank the people you interview for participating in the study.

**Before turning in the assignment, you should share with the person you have interviewed. Let them review it for accuracy. You should make any corrections that are necessary based on their comments.

The Paper. The paper should have these elements (approximate double-spaced page lengths are in parentheses):

Title: A Profile of Company X

I. Introduction -- What You Plan To Do (.5)

II. Company X -- Nature of Business (2.5)
- Goals
- Motivation
- Experience

III. Start-Up (2.5)
- Size
- Performance

IV. The Industry (5)
- Competitors
- Collaborators
- Professional Societies, Trade Associations, and Other Groups
- Government

V. Long-Range Plans (5)
- Current Problems
- Future Markets
- International Opportunities

VI. Conclusion

Appendices:
A. Interview Summaries
B. Copies of the Written Material

CS 564/NRE 513 STRATEGIES FOR ENVIRONMENTAL MANAGEMENT

Winter Term, 1995
Period 3 (January-February)
Monday-Wednesday, 8:30-10:00; 0235 Bus Ad
Monday-Wednesday, 11:30-1:00; 0205 Bus Ad

Professor Stuart L. Hart, School of Business Administration
7209 Bus Ad, 763-6820

In the past two decades, businesses have been forced to comply with increasingly stringent environmental regulations and requirements. Over the next two decades, corporations will be challenged to create new strategies rooted in the concept of environmental sustainability. Even now, there are observable regulatory, financial, market and social trends driving corporations toward "greening." In the 1990's and beyond, the environment will offer business opportunities of unparalled proportion to innovators, and a quagmire of cost and liabililty for laggards. Indeed, it is likely that competitive advantage in the coming years will be rooted in practices such as environmental partnerships, pollution prevention, industrial ecology, design for environment, life-cycle costing, and sustainable development. In the future, businesses (markets) will be constrained by and dependent upon ecosystems (nature), not the other way around.

Course Description

Recognizing this changing role of the corporation in society, this course will focus on the emerging relationships between environment, strategy, and competitive advantage. Some of the questions we will address include: What is the environmental challenge to business? Are economic and environmental goals necessarily trade-offs? Are there competitive benefits to moving beyond compliance? Can the environment provide a source of competitive advantage for companies? Is there a first mover advantage to be gained through an environmental strategy? What are the implications of sustainable development for the corporations of tomorrow?

Since effective environmental management means learning to work with environmental groups, regulators, and other stakeholders, this course seeks a mix of students from business, natural resources, public policy, public health, engineering, law, and related disciplines. The first few classes in the course will be geared toward developing an atmoshere of mutual learning. Students will be divided into "maxi-mix" teams on the first day and the next two sessions will involve the science-based students in helping to teach business/policy students about ecology and business/policy students in helping to teach science-based students about strategy. Once this foundation has been established, the course will then focus directly on the environmental challenge to business. Through a combination of cases, readings, lectures, videos, and simulations, class sessions will seek to engage students in discussions aimed at developing alternative models of strategy and organization based upon principles of environmental management. The course will close with a policy exercise (management simulation) on "Greening the Corporation." This exercise will enable students to practice what they have learned in a simulated corporation. It will involve students in making strategic decisions about research and development, product development, manufacturing, and marketing over a 20-30 year time horizon in a world making the transition to environmental sustainability.

Course Materials

A coursepack containing readings and cases will be available in the basement sales area of the Business School.

Three additional books are highly recommended as supplemental reading and will be placed on reserve in the Business School library:

Schmidheiny, Stephan, **Changing course: A global business perspective on development and the environment**. Cambridge: MIT Press, 1992.

Cairncross, Frances, **Costing the earth**. Boston: Harvard Business School Press, 1992.

Allenby, Braden and Richards, Deanna (Eds.), **The greening of industrial ecosystems**. Washington, D.C.: National Academy Press, 1994.

Course Requirments

Class participation will be a key factor in the success of the course. Given the diversity of the participants, mutual learning will be an important objective. While class attendance is crucial, extensive preparation and a willingness to share knowledge and perpsectives will also be expected. This will not be a course geared to "passive learning". In addition to attendance and participation, there will be a **group case analysis** assigned on 8 February and due on 15 February. This task will involve working in the assigned groups to analyze and make recommendations about a specific case. A premium will be placed on brevity-- papers will be limited to seven pages exclusive of exhibits and references. The two components of the class-- participation and group case analysis-- will be split equally in determining the final grade. All students are also expected to participate in the policy exercise, "Trans-Formation: Greening the Corporation" the week following spring break.

Summary Outline
Strategies for Environmental Management

Monday, 9 January: Introduction
Reading: "Business and environment: A time for creative coexistence" (Brewer)

Wednesday, 11 January: Ecology
Reading: "Ecological knowledge and environmental problem solving" (NRC)
Case: Control of Eutrophication in Lake Washington

Monday, 16 January: Martin Luther King Day (No Class)

Wednesday, 18 January: Strategy
Reading: "The core competence of the corporation" (Prahalad and Hamel)
Case: Laidlaw Environmental Services

Monday, 23 January: Environmental Collaboration
Reading: "It all began with conservation" (Stenger)
Case: McDonald's Environmental Strategy (A)
Environmental Defense Fund

Wednesday, 25 January: Beyond Compliance
Reading: "Proactive environmental management" (Hunt and Auster)
Case: Allied Signal

Monday, 30 January: Pollution Prevention
Reading: "It's not easy being green" (Walley and Whitehead)
Case: AT&T Environment and Safety

Wednesday, 1 February: Life Cycle Assessment
Reading: Note on Life Cycle Analysis
Case: McDonalds (B): The Clamshell Controversy

Monday, 6 February: Product Stewardship
Reading: "Design for environment: The new quality imperative" (Fiksel)
Case: Xerox: Design for the Environment

Wednesday, 8 February: Environmental Strategy I
Reading: "To pioneer or follow?" (Lieberman and Montgomery)
Case: Starkist (A)
Case analysis assigned

Monday, 13 February: Environmental Strategy II
Reading: "Sustainable advantage" (Ghemawat)
Case: Bayerische Motoren Werke AG

Wednesday, 15 February: Toward the Sustainable Corporation
Reading: "How green production might sustain the world" (Hart)
Case analysis due

SPRING BREAK-- Monday, 20 February-Wednesday, 22 February

Policy Exercise: Trans-Formation: The Sustainable Corporation Game
Reading: "Methods for Synthesis: Policy Exercises," (Brewer)

Duke University
Nicholas School of the Environment

ENV 298.16 Pollution Prevention (P2) Management and Policy

Fall, 1996
Instructor: Douglas J. Lober
Lober@env.duke.edu

A109 Levine Science Research Center
T: 2:00-4:45 pm

Pollution prevention (P2) has become both an environmental protection strategy and value-adding business practice supported by government, industry, the public, and environmental groups. Pollution prevention is defined by federal law as source reduction and other practices that reduce or eliminate the creation of pollutants through increased efficiency in the use of raw materials, energy, water or other resources, or protection of natural resources by conservation. Source reduction is any practice which reduces the amount of any hazardous substance, pollutant or contaminant entering any waste stream or otherwise released into the environment prior to recycling, treatment or disposal and which reduces hazards to public health and the environment. From a corporate perspective, pollution prevention can be also thought of as yield improvement.

To organize the study of the complex, multi-disciplinary topic of pollution prevention, this course is divided into five areas:

1) Federal and state pollution prevention programs
2) Business pollution prevention strategies such as design for the environment, ISO 14000, total quality environmental management, and product stewardship
3) Innovative pollution prevention approaches such as industrial ecology and collaborations
4) Pollution prevention tools including cost accounting and life cycle assessment
5) Public involvement in pollution prevention

The course will examine pollution prevention in reducing different types of waste (hazardous, radioactive, municipal solid) as well as energy and materials usage. It will include an emphasis on industrial process change as well as management and policy perspectives.

Specific topics to be covered are: definitions of pollution prevention; The Pollution Prevention Act; the capability of existing statutes to structure pollution prevention policy; the importance of information to achieve pollution prevention; the Toxic Release Inventory; innovative p2 approaches such as toxic use reduction, collaboration among multiple stakeholders, flexibility, and industrial ecology; state level programs including those of Massachusetts, New Jersey, and North Carolina; corporate management approaches including ISO 14000, design for the environment and total quality environmental management; total cost accounting for pollution prevention; and life cycle assessment.

This course will combine lecture, discussion, case studies, guest speakers and field trips, including a visit to DuPont's Kinston Polyester Plant with its award winning pollution prevention practices. Each student is expected to participate in class discussions.

A central part of this course will be a small group research project on an aspect of pollution prevention in North Carolina. These projects will involve collaboration with industry or state or federal government. Students are required to develop a research project which includes data collection and analysis.

Pollution Prevention Conferences:

There will be two pollution prevention conferences coordinated with the class which will enable students to gain access to current ideas, decisionmakers and thinkers in the field of pollution prevention.

a) *Putting Pollution Prevention in Action*, US EPA/Hampshire, Washington, DC, Sept. 10-11.
b) *Improving Environmental Performance: ISO 14000*, NC Division of Pollution Prevention, Durham, NC, Oct. 1.

Reading:

Reading packet

Gottlieb, R. (ed.) 1995. *Reducing Toxics: A New Approach to Policy and Industrial Decisionmaking*. CA: Island Press.

Cases: *Amoco/EPA Yorktown Refinery Pollution Prevention Initiative*
Duales System Deutschland
Vulcan Chemical
Hazardous Waste in North Carolina (A) (B) and (C)
Xerox: Design for the Environment
McDonald's Environmental Strategy(A) and The Clamshell Controversy(B1)
Green Lights: Graphic Design Considers an Upgrade
Polaroid: Managing Environmental Responsibilities and their Costs

Requirements:

1) research paper and class presentation (40% of grade)
2) 4 problem sets (10% each)
3) class participation (20 %)

Class Schedule:

Sept. 3 a) Overview of the course and definitions of pollution prevention

NPPC, "Pollution Prevention Concepts and Principles"

b) EPA's Comprehensive Pollution Prevention Orientation

Sept. 10 and 11 CONFERENCE: *Putting Pollution Prevention into Action*
U.S. EPA, Hampshire Associates, Washington DC

Friday, Sept. 13 FIELD TRIP (7:30am - 5:00 pm)
DuPont Dacron Facility, Kinston NC

Award winning pollution prevention in an industrial setting

Reducing Toxics: pp 209-276.

Sept. 17 State level roles in pollution prevention

a) Guest Speaker: David Williams, Pollution Prevention Program
North Carolina's Office of Waste Reduction

Deyle and Bretschneider: "Spillovers of State Policy Innovations: NY's Hazardous Waste Regulatory Initiatives."
Piero (Master's Project), "A Survey of Waste Reduction in North Carolina"

b) Developing a new government-business relationship to achieve pollution prevention
The Amoco-Yorktown Refinery

"What Really Pollutes: Study of a Refinery Proves an Eye-Opener"

Case: Amoco/EPA Yorktown Refinery Pollution Prevention Initiative

Problem #1 given out: Policy Options for Encouraging Silver Recovery

Sept. 24 a) Pollution prevention in the traditional federal regulatory system
The Pollution Prevention Act (1990)

Strasser, "Promoting Pollution Prevention and Environmental Technology in the Traditional Regulatory System"
Johnson, "From Reaction to Proaction: The 1990 Pollution Prevention Act"
Pollution Prevention Act
Gottlieb, pp 1-94.

b) Information as regulatory tool: the Toxic Release Inventory

1993 Toxics Release Inventory: Executive Summary
Inform, "Toxics Watch 1995"
Bryson and Donohue, "Proposed Expansion of the TRI: The Materials Accounting Controversy"
Santos et al, "Industry Response to SARA Title III"

c) Innovative approaches: the 33/50 program and other voluntary programs

EPA's 33/50 Program Sixth Progress Update
EPA's Partners for the Environment fact sheet
NSOE Students, "Designing the Next Generation 33/50 Program: A Research Project"
Inform, "Tackling Industrial Toxic Waste"
Reducing Toxics, pp 124-165

Problem set #1: Silver due
Problem set #2 Voluntary P2 Initiatives given out

Oct. 1 CONFERENCE: *Improving Environmental Performance: ISO 14000,*
NC Division of Pollution Prevention, Durham, NC

What is the tie between ISO 14000 and pollution prevention?

Oct. 8 a) Innovative approaches: toxic use reduction

Laden and Gray, "Toxic Use Reduction: Pro and Con"
Massachusetts Toxics Use Reduction Act
Shapiro, "Measuring Toxics Use Reduction"

Debate on pros and cons of toxic use reduction

b) Innovative approaches: industrial ecology

Tibbs, Industrial Ecology- An Agenda for Environmental Management
Frosch and Gallopolous, "Strategies for Manufacturing"

c) Organizational factors influencing pollution prevention implementation

Tanner, et al. "Barriers to Waste Reduction Efforts"
Ochsner, "DuPont's Edge More Facility"

Problem set #2 due: Voluntary P2 Initiatives

Oct. 15 Innovative approaches for municipal solid waste reduction and recycling: packaging ordinances and public roles

a) the relationship between recycling and source reduction

Lober, "Recycling in America: Informing the Process"
Lober, "Municipal Solid Waste Policy and Public Participation in Source Reduction"

b) packaging

Case: Duales System Deutschland

Oct. 22 Fall Break

Oct. 29 a) Public and community involvement in waste reduction

Lynn, "Environmental Democracy in Action: The Toxic Release Inventory"

Case: Vulcan Chemical

b) NIMBY as a pollution prevention strategy? Hazardous and low-level radioactive waste

Case: Hazardous Waste in North Carolina (A, (B), and (C))

Nov. 5 a) Business approaches to achieve pollution prevention: Design for the environment, product stewardship, and total quality environmental management

Total Quality Environmental Management: A Methodology for Pollution Prevention
Reducing Toxics: pp 170-208.

Case: Xerox: Design for the Environment

problem set #3 given out: Life Cycle Concepts in Strategic Environmental Planning

b) Aligning industrial process and pollution prevention: the case of 3M and Polaroid

Reducing Toxics: pp 389-420.
Polaroid's corporate environmental report

Nov. 12 Tools for pollution prevention: life cycle assessment

a) Case: Case A: *McDonald's Environmental Strategy*
B1: The Clamshell Controversy

b) **Life cycle assessment: comparing dry cleaning processes**

NPPC, "Comparative study of PERC Dry Cleaning and An Alternative Wet Cleaning Process"
Keoleian and Menerey, "Sustainable Development by Design: Review of Life Cycle Design"

problem set #3 due Life Cycle Concepts in Strategic Environmental Planning

Nov. 19 Accounting for pollution prevention
Energy reduction

a) White et al. "Total Cost Assessment: Uncovering the Hidden Returns to PP Investments"

Case: Green Lights: Graphic Design Considers an Upgrade

b) *Case: Polaroid: Managing Environmental Responsibilities and their Costs*

Problem #4 due: green lights

Nov. 26 and Dec. 3 Presentations/ Future directions in P2

Papers due Dec. 3

Harvard Business School

Environmental Quality and Economic Advantage

Elective Curriculum
Fall 1997

Associate Professor Forest Reinhardt

Enclosed is an initial set of case materials for this course (others will be distributed during the term in class and in Course Services, Baker 20). Please see the On-Line Course Platform for all course outlines, schedules, assignments, announcements, and exercises. Since this information can change often and on short notice, please check the Course Platform regularly for important updates.

If you are missing any material from this packet, please call Course Services at 495-6263 or stop by Baker 20 to arrange for a replacement.

COURSE OVERVIEW

This course is for students interested in environmental problems and the ways in which they affect business management and corporate strategy.

Over the past twenty years, spending on environmental amenities has increased substantially, both in the rich nations and in the developing world. Economic growth, a series of well-publicized disasters, and evolving scientific understanding of environmental phenomena have all contributed to increased demand for environmental protection.

We wish to understand how firms can satisfy their traditional obligations to capital providers while also contributing to the solution of environmental problems. To do so, we examine the practical questions that managers confront when competing in pollution-intensive and resource-based industries. Understanding these questions requires the integration of economic and business management frameworks with concepts drawn from the natural sciences, politics, and law.

Content and Organization

Environmental Quality and Economic Advantage consists of twenty-nine class sessions, plus a final exam. Most of the discussions are based on company cases, although government and non-profit institutions figure prominently as well. About two-fifths of the classes are about firms doing business outside the United States, or about international environmental problems. Case protagonists range from Fortune 50 firms to start-ups.

Environmental problems affect each of the traditional functional areas of the firm. For this reason, the cases draw heavily on concepts introduced in various required MBA courses, and many of the cases would fit easily in courses on strategy, finance, marketing, control, or business-government relations. At the same time, environmental problems are inherently cross-disciplinary, spilling across the boundaries that separate traditional academic disciplines. The cases in the course therefore draw on economics, politics, natural science, engineering, and law. The cases are supplemented by readings from academics and practitioners who have shaped societal views about the appropriate roles for business and government in managing environmental quality.

The course is organized in four parts. Part I introduces notions of public goods, externalities, social welfare, and natural resource pricing that will be useful throughout the course. Part II emphasizes management in the regulatory arena: it examines the relationships between government regulatory programs and the behavior of firms. Part III extends this analysis to consider the environmental policies of firms that choose voluntarily to reduce their environmental loadings, or to provide environmental benefits, beyond the levels required by law. We focus here on the different ways in which firms offset the additional costs that their environmental policies may entail. In Part IV, we consider some questions of environmental

management in developing countries, and study the relationships between corporate practice and sustainable development; we also consider the roles of not-for-profit institutions in contributing to environmental quality and economic advantage.

The course begins with two introductory cases involving company strategy in heavily regulated, environmentally sensitive businesses. Part I of the course also introduces important concepts of private and social cost, natural resource economics, and benefit-cost analysis, to which we will make repeated reference during the rest of the course.

In Part II, we consider some classic problems involving natural resources, air pollution, and waste management. We look at the effects of governmental regulatory policies on firms, and also at firms' attempts to shape those policies to their own advantage. That is, we study the relations between a firm's behavior in the marketplace and its behavior in the non-market arena, paying special attention to political strategy and to business-government relations. Here, as throughout the course, we analyze managerial choices in the light of several criteria, including the maximization of expected value, the reduction of risk, the acquisition or maintenance of goodwill, and adherence to managerial ethics.

In Part III, we examine firms pursuing more aggressive environmental policies, typically involving the voluntary provision of environmental amenities. Firms that pursue such strategies need to find ways to offset increases in their costs. Some have tried to do so through product differentiation, recapturing increased costs from consumers. Others have attempted to identify private cost savings that more than offset the increased costs of environmental protection. Still others try to satisfy both environmental and shareholder value objectives through strategic behavior, raising rivals' costs and thus securing competitive advantage through environmental performance. We examine the conditions under which each of these methods may be successful.

In Part IV, we examine various notions of sustainable development, with special attention to environmental problems in less developed countries, and analyze the relationships between sustainable development and corporate performance. We also study the contributions of not-for-profit groups to the provision of environmental quality.

* * *

As is clear from this brief description, the course employs an extremely broad definition of "environmental management." It considers environmental service businesses, natural resource firms, companies whose processes have historically been pollution-intensive, and firms that have not historically been affected much by concern about the environment. And it considers those firms not just from the perspective of regulatory strategy and cost minimization, but in a broader context of strategic management and decision-making with numerous, possibly competing objectives.

Class participation will account for 60% of each student's grade, with the remainder based on a four-hour written exam.

ENVIRONMENTAL QUALITY AND ECONOMIC ADVANTAGE

LIST OF MATERIALS

Book:

Forest L. Reinhardt and Richard H. K. Vietor, *Business Management and the Natural Environment: Cases and Text* (Cincinnati, Ohio: South-Western College Publishing, 1996).

Cases:

Controlling Acid Rain, 1986	Kennedy School Case #C15-86-699.0	
Duales System Deutschland	9-795-074	
Responsible Care	9-391-135	Rev. 3/18/91
Loblaw Companies Limited	9-590-051	
Metsä-Serla: Environmental Labels in the European Forest Products Markets	9-795-148	Rev. 5/18/95
Freeport Indonesia	N9-796-124	
Tokyo Electric Power Company	N9-797-046	

Supplemental Readings:

Daniel B. Luten, "The Limits-to-Growth Controversy," originally printed in K.A. Hammond, G. Macinko, and W. Fairchild (eds.), Sourcebook on the Environment (University of Chicago Press, 1978); reprinted in Thomas R. Vale (ed.), Progress Against Growth: Daniel B. Luten on the American Landscape (New York: Guilford Press, 1986).

Michael E. Porter and Class van der Linde, "Green and Competitive: Ending the Stalemate," Harvard Business Review, September-October 1995.

Robert Solow, "An Almost Practical Step Toward Sustainability." Washington: Resources for the Future, 1992.

Jonathan A. Patz, et. al. , "Global Climate Change and Emerging Infectious Diseases," Journal of the American Medical Association, 275 no. 3 (January 17, 1996).

Ross Gelbspan, "The Heat is On," Harper's Magazine, December 1995.

Other materials will be distributed later, including:

Monsanto Company, "Environmental Annual Review 1996."
Excerpts from Monsanto's annual report to shareholders.

SCHEDULE OVERVIEW

I. FOUNDATIONS

A. PUBLIC GOODS AND SOCIAL COSTS

1.	Sept . 9	Hydro-Quebec
2.	Sept. 11	Champion International Corporation

B. FUNDAMENTALS OF ENVIRONMENTAL AND RESOURCE ECONOMICS

3.	Sept. 15	Solow, "The Economics of Resources"
4.	Sept. 16	Controlling Acid Rain, 1986

II. GOVERNMENT REGULATION AND FIRM BEHAVIOR

A. REGULATION OF ENVIRONMENTAL EXTERNALITIES

5.	Sept. 22	Acid Rain: Burlington Northern, Inc. (A)
6.	Sept. 23	Acid Rain: The Southern Company (A) and (B)
7.	Sept. 24	Duales System Deutschland
8.	Sept. 29	Allied-Signal

B. INSTITUTIONAL ALTERNATIVES TO ENVIRONMENTAL REGULATION

9.	Sept. 30	Note on Contingent Environmental Liabilities
10.	Oct. 6	Responsible Care
11.	Oct. 7	Environment and International Trade

III. CORPORATE ENVIRONMENTAL POLICY BEYOND REGULATION

A. PRODUCT DIFFERENTIATION

12.	Oct. 8	Loblaw
13.	Oct. 14	StarKist (A)
14.	Oct. 15	Metsä-Serla
15.	Oct. 20	Reading Energy

B. INNOVATION OFFSETS

16.	Oct. 21	Xerox
17.	Oct. 22	Aracruz Celulose, S.A.

C. STRATEGIC BEHAVIOR

18.	Oct. 27	Du Pont Freon Products Division (A)
19.	Oct. 28	Alberta-Pacific Forest Industries Inc.

IV. PRIVATE CONTRIBUTIONS TO SUSTAINABLE DEVELOPMENT

A. NOTIONS OF SUSTAINABLE DEVELOPMENT

20.	Nov. 3	Freeport Indonesia
21.	Nov. 4	China (C)
22.	Nov. 17	Tokyo Electric Power Company
23.	Nov. 18	to be announced
24.	Nov. 24	Scientific and Economic Aspects of Climate Change

B. ORGANIZATIONAL INNOVATION AND THE ENVIRONMENT

25.	Dec. 1	Montana Land Reliance
26.	Dec. 2	Environmental Defense Fund

C. SUSTAINABLE DEVELOPMENT AND THE FIRM

27.	Dec. 8	Monsanto Company documents
28.	Dec. 9	to be announced
29.	Dec. 10	Concluding presentation: no assignment

ENVIRONMENTAL QUALITY AND ECONOMIC ADVANTAGE ASSIGNMENTS, FALL TERM, 1996

Class No. 1, September 9

Reading:

Hydro-Quebec (in casebook)

Supplemental Readings [included in the casebook]:

Ronald Coase, "The Problem of Social Cost," 3 Journal of Law and Economics (October 1960), pp. 1-44.

Aldo Leopold, Sand County Almanac (1949), pages 137-141, 188-190, 237-251.

Owned by the provincial government of Quebec, Hydro-Quebec generates hydroelectric power and sells it both in Canada and in the United States. In the early 1990s, its plans to build a large complex of dams in northern Quebec have generated fierce opposition from some native groups and from U.S. environmentalists. The case raises fundamental questions of public goods and social costs, which will arise repeatedly throughout the course.

The excerpts from Coase and Leopold reprinted in the casebook encapsulate divergent and useful ways of thinking about environmental questions on which we will draw frequently during the course. Before the first class meeting, you should read parts I through VI and part X of the Coase article (pages 1-19 and 42-44 in the original, or pages 1-70 through 1-80 and pages 1-95 and 1-96 in the casebook) and at least the first several pages (137-141, 188-190, and 237-246 in the original, or 1-43 through 1-47 in the casebook) of the Leopold excerpts. The remainder of these selections can be skimmed or read later.

Coase won the Nobel Prize for Economics in 1991, largely for writing "The Problem of Social Cost" more than thirty years earlier. Leopold was one of the pioneers of ecological science, and an intellectual godfather of western environmentalism.

With the Hydro-Quebec case, the Coase and Leopold readings constitute an unusually heavy initial assignment. Time invested in understanding Coase and Leopold will, however, pay substantial dividends throughout the course.

Discussion questions:

1. Do you expect Hydro-Quebec to implement its Grand Baleine plans? What will determine the enterprise's decisions?

2. From a social perspective, do you think the dams ought to be built? Why or why not?

3. What light does Coase's article shed on the problems faced by Hydro-Quebec and its adversaries?

4. Leopold died before "The Problem of Social Cost" was written. What do you think he would have had to say about Coase's arguments? Would they have agreed? If not, who is right?

Class No. 2, September 11

Reading:

Champion International Corporation: Timber, Trade, and the Northern Spotted Owl (in casebook)

We continue our appraisal of public goods problems by traveling with Tag Edwards, a timber company vice president, to the northwestern United States The federal government's listing of the northern spotted owl as an endangered species has radically altered timber markets in that region. Edwards needs to understand the implications for his various operations, and to consider what changes to implement in response.

Discussion questions:

1. What are the basic economics of the industries in which Edwards competes? What have the government's action in this case done to the economics of the markets for forest products in the Northwest?

2. What motivates the government's interventions in northwestern timber markets? Do you think this is good policy?

3. How should Champion respond? To whom is the company responsible?

4. What light do the writings of Leopold and Coase shed on the problems facing Champion?

Class No. 3, September 15

Reading:

Robert Solow, "The Economics of Resources or the Resources of Economics" (1974) (in casebook).

Daniel B. Luten, "The Limits-to-Growth Controversy" (1978) (in case packet)

Robert Solow, an economist trained at Harvard, has spent most of his career at MIT, and received the Nobel Prize in 1987 for his work on economic growth. We read an address that he delivered to his colleagues in the American Economic Association shortly after the first oil shock. In it, Solow reviews the basics of natural resource economics and the possible reasons that unregulated markets might fail to allocate resources optimally over time.

We also examine an article by Daniel B. Luten, who taught geography for many years at the University of California at Berkeley. Luten is a self-described "pessimist" in the limits-to-growth debate, and a confidant of David Brower, the environmentalist featured in John McPhee's Encounters with the Archdruid (1971); his views afford an interesting contrast with Solow's. [The Luten piece was originally printed in K.A. Hammond, G. Macinko, and W. Fairchild (eds.), Sourcebook on the Environment (University of Chicago Press, 1978); it was reprinted in Thomas R. Vale, ed., Progress Against Growth: Daniel B. Luten on the American Landscape (New York: Guilford Press, 1986). The reference list, from Vale's book, contains works not cited in this particular essay.]

Discussion questions:

1. Evaluate Solow's argument. Would Coase agree with him? Do you?

2. Under what conditions will markets allocate nonrenewable resources efficiently over time?

3. How would Luten evaluate Solow's arguments?

4. Luten says, "On the limits-to-growth issue there is no place for fence sitters." Do you think he is right? If so, which side of the fence do you inhabit? If not, why do you think he is wrong?

Class No. 4, September 16

Reading:

Controlling Acid Rain, Kennedy School case number C15-86-699.0

We continue our coverage of the economic analysis of natural resources and the environment, using a case from Harvard's Kennedy School of Government. It is assigned there to teach the basics of benefit-cost analysis, perhaps the most widely used conceptual tool for analyzing environmental problems and formulating government policies. The case also serves as the introduction to a three-day series on acid rain.

Discussion questions:

1. What are the costs of acid rain control? Which costs should the government include in its analysis? Which costs should it exclude?

2. Did the NAPAP study evaluate the appropriate benefits of control and place the correct dollar values on those benefits?

3. Is benefit-cost analysis an appropriate decision tool for this problem? Why or why not? If not, what would you propose as an alternative?

Class No. 5, September 22

Reading:

Acid Rain: Burlington Northern, Inc. (A) (in casebook)

We now approach the problem of acid rain from the perspective of a railroad whose principal product is the transportation of low-sulfur coal. Burlington Northern executives understand that their product's competitive position depends, in part, on the form of acid rain legislation that the Congress passes; now they need to decide what to do.

Discussion questions:

1. Is the Clean Air Act a significant issue for Burlington Northern?

2. Are BN's arguments about technology-forcing and cost sharing valid? Does the validity of BN's arguments matter to BN's shareholders or to its managers?

3. Would BN benefit from legislation that established tradable emission rights for utilities?

4. What should BN do about this legislative issue? Should it commit managerial and economic resources to direct involvement in the political process?

Class No. 6, September 23

Reading:

Acid Rain: The Southern Company (A) and (B) (in casebook)

We end our analysis of acid rain by examining the implementation of the 1990 Clean Air Act Amendments from the point of view of a multi-state electric utility holding company. The firm's managers must decide how to comply with the Act, using some combination of fuel switching, investments in scrubbers, intra-firm trading of pollution permits, and trading with other parties. Regulatory and political risks complicate the decision.

Discussion questions:

1. How will the market for tradable sulfur dioxide allowances evolve?

2. What should the Southern Company do? What problems would you anticipate in the implementation of a compliance strategy?

3. Given your analysis of this situation, do you think markets are likely to emerge for other forms of pollution, such as carbon dioxide?

Class No. 7, September 24

Reading:

Duales System Deutschland, case number 9-795-074

Here we see a very different kind of regulatory structure for waste management: an explicit attempt to assign prices to waste flows. The German government has tried to establish a comprehensive system of recycling and reuse for packaging materials. Interrelated economic and political problems have turned the effort into a growing liability for the government. In late 1993, Environment Minister Töpfer must decide whether to continue, restructure, or abandon the system.

Discussion questions:

1. What are the objectives of the Duales System Deutschland? Is it succeeding? Why or why not?

2. Who are the main beneficiaries of the Green Dot system?

3. Do you share the environmentalists' concerns about the Green Dot's effect on the Blue Angel and other eco-labels? Should government officials and business executives be worried about those effects?

4. Should governments ban or restrict international movements of municipal waste? Hazardous waste?

5. As of the end of 1993, what do expect the German firms to do? What do you expect the administrators in Brussels to do? What do you think Töpfer will do?

Class No. 8, September 29

Reading:

Allied-Signal: Managing the Hazardous Waste Liability Risk (in casebook)

In one of the most important cases in the entire course, we look inside a huge industrial conglomerate with a checkered environmental past. Allied-Signal is now trying to set up waste reduction and liability management programs to confront the problems we have been discussing in preceding cases. Its managers need to decide how to choose the right level of effort, and how to organize the endeavors to ensure effective implementation.

Discussion questions:

1. How has hazardous waste policy affected Allied-Signal?

2. Does Allied-Signal's hazardous waste management strategy make sense? How can you tell?

3. What are the organizational capabilities necessary to implement such a strategy?

4. Should Callahan recommend any changes in this system

Class No. 9, September 30

Reading:

Note on Contingent Environmental Liabilities (in casebook)

Contingent environmental liabilities, particularly those arising from hazardous waste, present vexing problems for executives in firms of several different kinds, including manufacturers, insurance companies, and banks. We consider the ways in which firms have tried to manage these liabilities, and also examine the prospects for reform of the Superfund statutes.

This case and the two that follow it all depict attempts to manage environmental externalities outside of the traditional governmental regulatory framework. We want to understand the circumstances under which common law remedies (as in today's case), private collective action (like Responsible Care), or new institutions (like those described in the international trade note) can be effective complements to or even substitutes for traditional regulatory approaches.

Discussion questions:

1. What are the managerial implications of the material in the note for executives in manufacturing firms, executives in lending institutions, and insurance company executives?

2. How should firms decide whether to invest in internal environmental audits and other assessments of potential liabilities?

3. In your view, are current requirements for financial reporting of environmental liabilities (under GAAP and the SEC rules) adequate?

4. How, if at all, do you think Congress should alter the Superfund statute?

Class No. 10, October 6

Reading:

Responsible Care, case number 9-391-135

In this case, members of the Chemical Manufacturers Association, troubled by their industry's poor environmental reputation and worried about the prospect of additional government regulation, attempt to create a private solution to the provision of public goods.

Discussion questions:

1. What is your assessment of Responsible Care? What are its objectives? Will it succeed?

2. Could initiatives like Responsible Care work in other industries that we have studied in this course, or in other industries with which you are familiar?

Class No. 11, October 7

Reading:

Note on Environment and International Trade (in casebook)

Many of the cases in the course touch on international trade and its regulation. Here, we examine the institutional regimes designed to integrate trade and the environment, and analyze the tensions that make that integration so difficult. Questions about institutional design, analyzed in previous cases, arise again in the international context.

Discussion questions:

1. What is the strongest argument to be made for the American side in the dispute over tuna and dolphins? What is the strongest argument for the Mexican side? In your view, did the GATT dispute settlement panel do the right thing? What are the business implications of this dispute?

2. What is your appraisal of the Basel Convention?

3. Are there circumstances under which OECD governments should require their firms to comply with environmental standards set in the home country when the firms operate in countries with less stringent regulations? Are there circumstances under which the companies should do so anyway, even if this is not required?

Class No. 12, October 8

Reading:

Loblaw Companies Limited, case number 9-590-051

Loblaw, a Canadian grocery chain, has aggressively promoted its line of private label products, President's Choice. It is now trying to expand this line to include "green" products said to be preferable from the standpoint of consumers' health or the

environment. The case raises questions about green marketing, eco-labeling schemes, and corporate motives for environmental activism.

The case begins a series of discussions about companies that are trying to differentiate their products along environmental lines. They hope that this will enable them to capture price premiums or market share increases, offsetting any increases in costs that they may incur. We want to understand the circumstances under which such policies may succeed.

Discussion questions:

1. Does the President's Choice G.R.E.E.N. concept fit into the overall corporate strategy of Loblaw? If so, why? If not, why not?

2. What changes would you make in Loblaw's strategy?

3. Should Pollution Probe and Friends of the Earth have added their endorsements to the G.R.E.E.N. products? Should they have accepted funds from the company?

4. Is the Environmental Choice maple leaf label an appropriate vehicle for consumer identification of environmentally products?

Class No. 13, October 14

Reading:

StarKist (A) (in casebook)

This case describes one of the most famous "green marketing" initiatives in history: the decision by StarKist, Heinz's canned tuna subsidiary, to sell only "dolphin-safe" products. We analyze the ramifications of this decision for Heinz's business and for marine ecosystems.

Discussion questions:

1. Do you think StarKist's managers made the right decision in April 1990? Why or Why not? On what criteria are you basing your evaluation?

2. What else would you like to see StarKist do?

Class No. 14, October 15

Reading:

Metsä-Serla: Environmental Labels in European Forest Products Markets, case number N9-795-148

We continue our general discussion of environmental product differentiation with a case on a Finnish wood products company that allows a close examination of the eco-labeling schemes touched on in the previous cases. Metsä-Serla exports most of its output to other European nations. The architects of environmental labeling schemes like the German Blue Angel and the Nordic Swan are paying particular attention to products in the wood products sector. Metsä-Serla executives need to decide how these eco-labeling schemes will alter their markets, and how the company should manage the changes.

Discussion questions:

1. What accounts for the labeling authorities' interest in paper and wood products? Why have they focused so much effort on this sector?

2. Why are most environmental labeling programs run by hybrid government-private organizations or consortia? Why do they tend to write standards that are relative (i.e., designed so that only a specified fraction of products in a category qualify for the label) rather than absolute?

3. Is it a good idea for the European Union to establish its own environmental label? Should the EU oversee or approve national labeling schemes (like the Blue Angel) that its member countries have established?

4. What advice would you give to Timo Poranen? Does Metsä-Serla need a centralized policy with respect to environmental labels? What use should it make of environmental labels in its marketing? How, if at all, should it try to involve itself in the debates about forest practices and the possible labeling of lumber and plywood?

Class No. 15, October 20

Reading:

Reading Energy (in casebook)

This case integrates questions of environmental product differentiation, the pricing of energy and waste flows, business-government relations, and environmental justice. Tom Cassel, a Philadelphia entrepreneur, is trying to build a solid waste incinerator in a small, poor suburb of Chicago, but has encountered stiff political resistance. The case

requires the analysis of an entrepreneurial investment opportunity. It also raises broader questions about the use of quantitative environmental risk assessment and about environmental equity.

Discussion questions:

1. Does Robbins present a good opportunity for Tom Cassel? Should he continue to pursue it?

2. What accounts for the opposition to the project? What role has quantitative risk assessment played?

Class No. 16, October 21

Reading:

Xerox: Design for the Environment (in casebook)

Supplemental Reading:

Michael Porter and Class van der Linde, "Green and Competitive: Ending the Stalemate," Harvard Business Review, September-October 1995.

Xerox, one of the world's largest manufacturers of office equipment, is in the process of reorganizing its product delivery system to manage more effectively its flows of materials, products, and waste. The company is developing standards and systems for "design for the environment," with the objective of continuous diminution of waste from products and processes.

Discussion questions:

1. Evaluate Xerox's environmental management program. What accounts for its successes and failures?

2. What are the program's objectives? Do you think they are appropriate?

3. What advice would you give Xerox executives about the implementation of the environmental program? How should Xerox manage its relations with government and with customers? In particular, do you think Xerox should continue to lobby against government standards for recycled and remanufactured content?

4. Does Xerox's experience provide support for the views of Porter and van der Linde? To what degree can one generalize from the Xerox case to other firms in other industries?

Class No. 17, October 22

Reading:

Aracruz Celulose S.A. (in casebook)

Supplemental Reading:

Robert Solow, An Almost Practical Step Toward Sustainability (Washington: Resources for the Future, 1992).

Aracruz, a Brazilian competitor in the market pulp business, has attempted to establish forestry practices and pulpmaking operations that provide sustainable advantage in the competitive sense and contribute to "sustainable development" from an environmental perspective. Aracruz is now contemplating additional investments in water pollution control; it is also considering whether to exploit its expertise in plantation forestry by expanding its operations in Brazil or abroad. The case allows an application of the ideas put forth by Porter and van der Linde, and also looks forward to the classes on sustainable development later in the term.

Discussion questions:

1. What are the important economic characteristics of the industry in which Aracruz competes? How are those characteristics changing?

2. What should Lorentzen do in the short run? Should he install new bleaching equipment? In the longer term, should he integrate downstream, or build a second forestry and pulp complex in Brazil or elsewhere?

3. Does the Aracruz experience provide empirical support for Porter and van der Linde's theories?

4. Would Solow say that Aracruz's operations are an example of sustainable development? Would you agree with him?

Class No. 18, October 27

Reading:

Du Pont Freon Products Division (A) (in casebook)

In March 1988, the world's largest producer of chlorofluorocarbons must decide how to respond to a new scientific report issued by the U.S. government, which includes new evidence about the destruction by CFCs of stratospheric ozone. The case requires us to craft a strategy for Du Pont in the marketplace and in the political arena, considering numerous competing objectives and stakeholder groups.

This case and the following one depict companies that are contemplating the use of the environment as a source of competitive strategic advantage. By helping to alter societal expectations of their industries' environmental performance, they hope to restructure the industries' economics to their own benefit, while also contributing to the solution of environmental problems.

Discussion questions:

1. What is your evaluation of Du Pont's strategy with respect to its CFC business over the period of 1974-1986?

2. How has the Montreal Protocol affected CFC markets? What will be the likely impacts of the Trends Panel Report?

3. What would you recommend that Joe Glas do now? Why?

Class No. 19, October 28

Reading:

Alberta-Pacific Forest Industries (in casebook)

Alberta-Pacific, a Canadian competitor of Aracruz, harvests aspen in the boreal forests. Like Aracruz, it has explicitly committed itself to "sustainable development." It is now trying to implement sustainable forestry practices and to open its decision-making processes to numerous stakeholders. Environmentalists remain skeptical, as do Alberta-Pacific's industry competitors.

Discussion questions:

1. Is the Alberta-Pacific project a good one for Mitsubishi Corporation? For the province of Alberta?

2. How would you evaluate Alberta-Pacific's strategy and tactics in the non-market arena? What advice would you give to Fenner, Ruault, Lang, and Fujieda?

3. Are Alberta-Pacific's operations an example of sustainable development?

Class No. 20, November 3

Reading:

Freeport Indonesia, case number N9-796-124

Discussion questions:

1. How, very approximately, are the resource rents from the mine being divided among residents of Irian Jaya, the Indonesian government, governments of the US and other nations, and Freeport shareholders? What might explain this allocation of rents?

2. What is your evaluation of Freeport's environmental management program? Is it allocating about the right amount of money and management time to the environment, and in about the right ways? How can you tell?

3. Recall the reading by Robert Solow ("An Almost Practical Step Toward Sustainability") that we read in conjunction with the cases on Aracruz and Alberta-Pacific. Does the Freeport operation conform to Solow's definition of sustainability? On what assumptions, if any, does your answer depend?

Class No. 21, November 4

Reading:

China (C) (in casebook)

The rapid pace of Chinese economic growth creates environmental problems of unprecedented scale and scope. This note focuses on the energy sector, where widespread use of low-quality coal leads to local, regional, and global air pollution. We consider the options for the Chinese government, and the possibility that western firms or governments might contribute to a solution of these problems.

Discussion questions:

1. How has Chinese energy policy affected the country's development over the past decade? What effects do you anticipate over the next ten years? Can China continue to grow at its recent rates?

2. Are environmental preservation and protection important objectives for the Chinese government? Are Chinese officials concerned about global climate change? Should they be? If they are, what should they do?

3. What role can western governments play in Chinese energy policy? What about western firms?

Class No. 22, November 17

Reading:

Tokyo Electric Power Company, case number N9-797-046

Assignment questions to be distributed.

Class No. 23, November 18

Reading to be distributed.

Assignment questions to be distributed.

Class No. 24, November 24

Reading:

Jonathan A. Patz, et. al. , "Global Climate Change and Emerging Infectious Diseases," Journal of the American Medical Association, 275 no. 3 (January 17, 1996).

Ross Gelbspan, "The Heat is On," Harper's Magazine, December 1995.

Assignment questions to be distributed.

Class No. 25, December 1

Reading:

Montana Land Reliance (in casebook)

This case treats a small, entrepreneurial non-profit venture in the American West. The Reliance creates and maintains easements (restrictions on subdivision and other forms of development) for private lands in the mountains and valleys of Montana. The case

raises questions of land use, public policy, non-profit management, and entrepreneurship.

Discussion questions:

1. Evaluate the strategy of the Reliance, and the implementation of the strategy.

2. What should the Reliance do now? What should its objectives be?

Class No. 26, December 2

Reading:

Environmental Defense Fund (in casebook)

We examine the strategy and operations of the Environmental Defense Fund, arguably one of the most successful environmental groups. EDF has adopted a strategy that features market-oriented policies and formal cooperation with business. The organization's choices, as it decides how to allocate its resources for maximum environmental benefit, raise broader questions about the relative importance of various environmental problems, and the roles that individuals and organizations can play in their solution.

Discussion questions:

1. From EDF's perspective, why was the collaborative project with McDonald's a success? How should EDF follow up on the McDonald's project?

2. Can EDF continue to grow as fast as it has recently? Should it do so?

3. What is your appraisal of "Third Wave environmentalism"?

4. What is your appraisal of the agenda that EDF has set for itself (summarized in the Appendix to the case)? Are these the right issues for EDF to be working on? Why?

Class No. 27, December 8

Reading:

Monsanto Company, "Environmental Annual Review 1996" (to be distributed)
Excerpts from Monsanto's annual report to shareholders (to be distributed)

Instead of a case, we will use as the basis for discussion a report produced by Monsanto Company about its environmental programs. New chief executive Robert Shapiro talks about a "commitment to environmental sustainability" and his desire to create a "truly sustainable company." We will analyze the substantive content of the report, and also discuss its uses and limitations as a communications tool.

Discussion questions:

1. Why did Monsanto produce this document? Who is its intended audience? In your view, was it a good idea for Monsanto to produce it?

2. What is a "sustainable company"? What must Monsanto do to become one?

Class No. 28, December 9

Reading to be distributed.

Assignment questions to be distributed.

Class No. 29, December 10

Concluding presentation

Reading:

none