UCLA Anderson
School of Management

BUSINESS AND THE ENVIRONMENT

Management 298D, Section 06
Spring Quarter 2004

Prof. Charles J. Corbett

INSTRUCTOR	Professor Charles J. Corbett Gold Hall, Room B-507 Phone: 310-825-1651 E-mail: ccorbett (internal) or charles.corbett@anderson.ucla.edu (external)
CLASS HOURS	Tuesdays from 4:00pm – 6:50pm
CLASSROOM	Cornell Hall, D-301
OFFICE HOURS	"Open Door" policy, by appointment and immediately after class

COURSE DESCRIPTION

CONTENT

There are many ways in which organizations interact with the natural environment, and many reasons to care about such interactions. Those reasons include purely business-minded reasons, such as marketing opportunities and potential for cost reductions, legal reasons, such as liability concerns and current and upcoming regulations concerning emissions and product takeback, and ethical reasons, such as a personal or institutional desire to "do good". Each of these reasons is thoroughly legitimate, but in this course, we will take a relatively business-oriented perspective to environmental issues. In other words, we will focus on the question: "what do I need to know about environmental issues to make my company more successful?"

During this course, we will first summarize the environmental issues facing business and society at large, including global warming, air and water pollution, soil contamination, etc. We will examine current and future legislation, both in the US and elsewhere in the world, related to each of these issues. We will then examine some environmental issues in each of the main areas of the MBA program: finance, marketing, operations, supply-chain management, accounting and strategy. During the course, we will also discuss a wide range of popular environmental literature (books by Cairncross, Diamond, Hawken, Lovins and many others).

METHOD

The course consists of a combination of lectures, case discussions and discussions of other materials.

A **group project** is a major component of the course. Each group will choose a research question related to the interaction between business and the environment.

VIDEOCONFERENCING

To accommodate the students from UC Irvine and UC Riverside participating in this class, all sessions will be conducted through an internet-based videoconference hookup with those campuses.

COURSE OVERVIEW

SESSION	DATE	TOPIC
1	April 6	**Introduction: Environmental Science** ▪ Introduction To The Course ▪ Introduction To Science Underlying Environmental Issues
2	April 13	**Life Cycle Assessment** ▪ LCA Exercise (Paper Vs. Electric Hand-Drying) ▪ Case: McDonald's And The Environment
3	April 20	**Environmental Economics; Environment And Strategy** ▪ Externalities ▪ Case: Global Climate Change And BP Amoco
4	April 27	**Environmental Marketing** ▪ Environment As Basis For Differentiation ▪ Green Advertising; Eco-Labels ▪ Case: Body Shop
5	May 4	**Environmental Operations** ▪ TQM And TQEM; Product And Process Design ▪ Green Building
6	May 11	**Environmental Risk Assessment** ▪ Risk Assessment Exercise ▪ ISO 14001, EMAS ▪ Case: Chevron
7	May 18	**Environmental Issues In Supply Chains** ▪ Incentives (Chemical Management Services) ▪ Closed-Loop Supply Chains ▪ Case: HP
8	May 25	**Environment, Accounting And Finance** ▪ Does It Pay To Be Green? ▪ Does The Stock Market Care? ▪ How To Incorporate Environmental Performance In Accounting?
9	June 1	**Sustainable Development And International Business** ▪ Case: Freeport Indonesia
10	June 8	**Project Presentations**

GRADING

There will be no final exam. The final grade will be determined as follows:

Class Participation:	25%	
Group Presentation:	10%	
Assignments:	30%	(3 individual assignments)
Group Project:	35%	(report and presentation)

CLASS PARTICIPATION

This course will be quite heavily discussion-based, as is inevitable given the nature of the topic. As a result, you should be well prepared to participate in these discussions. This means reading the materials for that session, *thinking about them* and being creative and entrepreneurial in finding and digesting other relevant material from whatever sources you like to use.

GROUP PRESENTATION

As a way to broaden the scope of the course, most sessions will include a brief presentation by a group of students on a focused topic of their choice. (This is entirely separate from the group projects below, and need not be the same group.) Such a presentation could, for instance, be a short critique of a well-known book in the field (see below for some suggested titles), a brief discussion of a recent development in the environmental arena (e.g., related to WTO meetings, summit meetings, debates about upcoming local legislation, etc.) or anything else. You are NOT expected to do independent research for these presentations, but just to find a topic you think will be of interest to the entire group and to digest it for them. Check with me whether your topic is OK before you actually prepare your presentation. The presentation should be absolutely no more than 10 minutes (i.e., keep it to two slides).

ASSIGNMENTS

The three individual write-ups each count for 10% of the final grade. They are due in weeks 2, 3 and 4: deliberately early in the course, partly to get you into the material quickly, but mostly to avoid conflicting with the many other projects and assignments and exams you will likely have towards the end of the quarter.

The first assignment is a simple LCA exercise, to introduce you to a common way of measuring environmental impacts. The second asks you to think about how to convert environmental impacts into monetary values. The third asks you to study and discuss a few environmental advertising campaigns. Start this third one early; at least, start keeping an eye out for environmental advertising, so you will have some material to work with when this assignment is due.

GROUP PROJECT

Each group (4-6 members) chooses a topic to work on. If at all possible, identify a project with a real company with a real question, though this is not a hard requirement.

There is no hard rule on report length; take 20 pages, plus figures, as a rough guideline, but as always quality (insights, structure, breadth) comes before quantity.

The last session of the course will be devoted to these project presentations. Each group will hand in a one-page summary of their project the class prior, to stimulate class discussion in the last session. Approximately halfway during the course we will briefly check on each group's progress.

READINGS

All required materials for the course are contained in the course pack or will be handed out in class. Note that several of the sessions contain a lot of reading material: make sure you at least skim all of it, and focus more deeply on the articles that interest you most.

REQUIRED READINGS

Course binder, plus the required readings available online; additional materials will be handed out in class.

SUGGESTED BACKGROUND READINGS

These will not be used in class, but are possible choices to discuss in your group presentation:

- Paul Hawken. *Ecology of Commerce*.
- Paul Hawken, Amory Lovins, L. Hunter Lovins. *Natural Capitalism: Creating the Next Industrial Revolution*.
- Frances Cairncross. *Green Inc.*
- Carl Frankel. *In Earth's Company*.
- Bjorn Lomborg. *The Skeptical Environmentalist*.
- Joseph Romm. *Cool Companies*.
- Marc Epstein. *Measuring Corporate Environmental Performance*.
- Graedel and Allenby. *Industrial Ecology*.

There are many other good books on environmental science and management aimed at a broad audience.

BACKGROUND TEXTBOOKS

These will also not be used in class:

- Turner, Pearce and Bateman (1994). *Environmental Economics: An Elementary Introduction*. Johns Hopkins University Press.
- Folmer and Gabel (2000). *Principles of Environmental and Resource Economics*. Edward Elgar.

COURSE OUTLINE

SESSION 1

Introduction To Course And To Environmental Science

This session will serve as an introduction to the course, and provide a high-level overview of the science underlying the main environmental issues confronting our planet.

Readings

- "The Tragedy of the Commons." Garrett Hardin. *Science*. 162: 1243-1248. 1698. Available from several sources, including http://www.constitution.org/cmt/tragcomm.htm
- "Rapid Worldwide Depletion of Predatory Fish Communities." Myers & Worm. *Nature*. 423: 280-283. May 15, 2003.
- Read the course materials posted on the course website; there will be several PowerPoint files (env_science1.ppt, etc.) containing the science overview that we will cover in class.

SESSION 2

Life Cycle Assessment

Case: McDonald's and the Environment A, B1 (Skim Parts B2, C)

Available on course website. This series of cases focuses on the work of a Joint Task Force of McDonald's Corp. and the Environmental Defense Fund (EDF); first, as it addresses McDonald's solid waste management strategy and second, as it poses the question of whether or not to replace polystyrene packaging with paper wrap. This series allows students to consider how environmental issues affect corporate strategy, how selecting appropriate partners can build credibility, and how to frame decision-making in situations of limited information and conflicting perspectives.

Case Questions

1. Why did EDF approach McDonald's?
2. Why did McDonald's enter into the Joint Task Force with EDF?
3. Was EDF the right choice for a partner?
4. How well does the structure of the Joint Task Force serve as a model for future partnerships?
5. Has the Joint Task Force worked?
6. Should McDonald's continue its current recycling efforts or drop the "clamshell" sandwich container? Why?
7. Comment on the use of life-cycle analysis to arrive at your decision. What are the difficulties in using LCA for decision-making? What are the appropriate boundaries for the analysis? Is there one best solution? Does this change over time?

Individual Assignment

- Exercises 1a and 1b: Calculations of energy in life-cycle assessments (1a: "drying your hands" and 1b: "getting to work").
- Think carefully about the sensitivity analysis part of the exercise.
- Submit your answer to the assignment at the beginning of the class.

Once you have done the exercises you should:

- Feel confident in dealing with different units in quantitative analysis and be able to convert between them.
- Understand the distinction between feedstock, process and primary energy.
- Appreciate the role of different assumptions, and the need for transparency, in undertaking this type of analysis.

Readings

- "Note on the Trash Crisis." NPPC.
- "Note on Life Cycle Analysis." NPPC.
- "Thinking Outside 'the Box': Designing a Packaging Take-Back System." Matthews. *California Management Review*. Winter 2004. Available on course web site.
- "Sample Streamlined Life Cycle Assessment Project." Dave Allen. Available on course website.

SESSION 3

Environmental Economics; Environment and Strategy

Case: Global Climate Change and BP Amoco

BP Amoco is the world's third largest oil firm. Its CEO, Sir John Browne, broke with his industry colleagues in 1997 when he publicly declared that global climate change was a serious problem and pledged BP to play a significant role in the search for solutions. The company has committed itself to voluntary cutbacks of carbon dioxide, the main gas held responsible for global climate change. Browne and his fellow executives believe that their approach makes sense not just from the perspective of social responsibility, but also from a hardheaded business standpoint. This case provides the information necessary to evaluate this belief.

Case Questions

1. Why did BP Amoco make the voluntary pledges it did? How does BP Amoco expect to get rewarded for those pledges?
2. How do *you* think they will be rewarded?
3. How do you think other oil firms will react? How does BP Amoco want them to react?

Readings

- "Chapter 1: The Market and Nonmarket Environments." David Baron. *Business and Its Environment*. Prentice Hall. New Jersey. 2000.
- "Market Failure and the Environmental Policies of Firms: Economic Rationales for 'Beyond Compliance' Behavior." F. Reinhardt. *Journal of Industrial Ecology*. 3(1): 9-21. 1999.

A fundamental concept in environmental economics is that of an "externality." Some definitions of this include:

- The side effect on an individual or entity due to the actions of another individual or entity. For example, the production of energy in a nuclear power plant benefits the owners of the power plant, but creates externalities in the form of radioactive waste for the environment and its inhabitants.
- An externality is present whenever an individual's utility or production relationships include real (i.e., non-monetary) variables, whose values are chosen by others (persons, corporations, governments) without particular attention to the effects on the individual's welfare.

Individual Assignment

- Describe and rank two externalities you experience in one day and how much each costs or benefits you. (How much would you be willing to pay to remove (or get) the externality?) How would you find out what the cost or value of each of these externalities is to society? How would you measure that? How would you validate your measures?
- Pick two reasonably different externalities; for instance, "smoke from my neighbor's BBQ" and "music from my neighbor's parties" would be too similar.
- Submit a concise well-reasoned 1-2 page discussion of your answers at the beginning of class.

SESSION 4

Environmental Marketing

Case: The Body Shop International

The case traces the development of the Body Shop, a company founded on nontraditional values and beliefs that has grown to become a major player in the cosmetic and beauty products industry. Defying industry traditions of expensive packaging, massive advertising and retailing through department stores and pharmacies, the entrepreneurial Anita Roddick created a company that rejects all of these principles and many more. After describing the very different portfolio of business practices that Roddick has developed, the case then focuses on her unique management philosophy both within the company and externally. As a strong advocate for the environment and community activism, she has created a highly successful company based on what she calls "profit with principle." The trigger issue in the case is focused on the challenge that the company is facing in entering the U.S. market, which has very different characteristics from the European environment in which The Body Shop has developed. Roddick is challenged whether to change any of the company's so far successful strategy, organization and management values. Finally, the issue of her own succession is raised.

Case Questions

1. How has the Body Shop become such a success while defying proven industry norms and strategies? What are the most important sources of its success?
2. How do you evaluate Anita Roddick's management philosophy and style? How important a contribution did she make to the creation of the Body Shop? How important is her role in its ongoing management?
3. What lessons are there to learn from The Body Shop as a corporate model and Roddick as a model of management? To what extent is this approach unique and eccentric and to what degree are the challenges to a mainstream practice valid and generalizable?
4. How sustainable is The Body Shop's success? In particular, what should Roddick do about the emerging problems and expected difficulties of developing its operations in the United States?

Readings

- "Environmental Product Differentiation: Implications for Corporate Strategy." Reinhardt. *California Management Review*. 1998.
- "Shades of Green: A Multidimensional Analysis of Environmental Advertising." S. Banerjee, C.S. Gulas, et al. *Journal of Advertising*. 24: 21-32. 1995.
- "Consumer Responses to Corporate Environmental Advertising." J.J. Davis. *Journal of Consumer Marketing*. 11(2): 25-37. 1994.
- "Targeting consumers who are willing to pay more for environmentally friendly products." Bergeron Laroche and Barbara-Ferleo. *Journal of Consumer Marketing*. 8(6): 503-520. 2001.

- Web Research: check out a few "green marketing" Internet sites, including: http://www.greenmarket.com/ and http://www.envirolink.com/greenmarket/.

In-Class Discussion Assignment

- Who do you think the "green consumers" are? Where are they? Where do you believe the most opportunities exist for green marketing (product types, consumer types, geographic areas, etc)? What should the message be?
- Pick two eco-labels and find out as much as you can about them. Who administers the eco-label? Who decides which firms can carry the eco-label? How much do firms have to pay for the label? How much benefit do they get from the label? What criteria must they meet to carry the label?
- What successful and unsuccessful "green marketing" campaigns are you familiar with? Why were they (un)successful?

Individual Assignment

- Find a few "green" advertising campaigns and analyze them in terms of the readings from today's session and from any earlier marketing courses you have had.
- Submit a 1-2 page discussion of your answers and a copy of the advertisements at the beginning of class.

SESSION 5

Environmental Operations

Readings

- "Extending the horizons: Environmental aspects of lean operations." Charles J. Corbett and Robert D. Klassen.
- "Total Quality Environmental Management: The Primer." GEMI. Available at: http://www.gemi.org/TQE_101.pdf.
- "Building Momentum: National Trends and Prospects for High-Performance Green Buildings." US Green Building Council.

Background Readings

- "Achieving Environmental and Productivity Improvements through Model-Based Process Redesign." Kumar Rajaram and Charles J. Corbett. *Operations Research*. 50(5): 751-763. 2002. Available online through UCLA library (Rosenfeld Library home page, go to e-journals, then DOTM).
- "Evaluating Environmental Performance using Statistical Process Control Techniques." Charles J. Corbett and Jeh-Nan Pan. *European Journal of Operational Research*. 2002. Available through ScienceDirect.
- "The Costs and Financial Benefits of Green Buildings." Greg Kats. October 2003. Available Online: do NOT print, this is 134 pages.

Assignment

- Prepare a one-slide presentation outlining your intended group project. (You may email me ahead of time to discuss your ideas.)
- Think about what "environmental operations" means for companies that are not in manufacturing (e.g., service companies, banks, etc.). Among others, this would refer to having green buildings; what is a "green building"?

Resources on Green Building

- www.ciwmb.ca.gov/greenbuilding/
- www.eere.energy.gov/buildings/high_performance/
- www.epa.gov/opptintr/greenbuilding/
- www.usgbc.org
- and many others…

SESSION 6

Environmental Risk Assessment

Case: Environmental Risk Management at Chevron Corporation

Chevron Corp., headquartered in San Francisco, manages a worldwide, vertically integrated value chain from the oil well to the gasoline station. Mishandling of oil at any stage of production can damage the natural environment, human health, corporate profitability or all three. But at the same time, Chevron needs to be prudent about the amount of money it spends on measures to manage these risks, and environmental programs within the firm can conflict with a longstanding tradition of decentralized management. To manage risks more efficiently, Chevron executives are contemplating the use of quantitative decision tools that enable operating managers to compute rough benefit-cost ratios for various alternative risk management projects. The case focuses on the pros and cons of using such tools within the context of Chevron's overall system for environmental risk management.

Case Questions

1. Is Chevron using the right tools for managing environmental business risk? Why do those tools differ from those used to manage other types of business risk?
2. Should Chevron make company-wide use of quantitative risk management tools like DEMA?
3. If you are the CEO of Chevron, are you more worried that line managers will spend too much money on environmental risk management or not enough?

Readings on Risk Management

- "Process risk evaluation: what method to use?" Montague. *Reliability Engineering and System Safety*. 29: 27-53. 1990.
- *Understanding Risk Analysis*. Mark Boroush. Available on course web site.

Readings on ISO 14000 and Related Standards (Available on the Course Web Site)

- "ISO 14000: An Agnostic's Report from the Frontline." Charles J. Corbett and David A. Kirsch. *ISO 9000 + ISO 14000 News*. 9(2): 4-17. March-April 2000.
- "ISO 14001: irrelevant or invaluable?" Charles J. Corbett and Michael V. Russo. *ISO Management Systems*. 2001.

SESSION 7

Environmental Issues in Supply Chains

Case: Managing Product Returns at HP

Readings on Reverse Logistics / Closed-Loop Supply Chains

- "Design Engineering." Chris Hendrickson, H. Scott Matthews, Jonathan Cagan and Francis C. McMichael. *Closed-Loop Supply Chains*. Corbett, Dekker and Van Wassenhove (eds.).
- "Supply Loops and their Constraints: The Industrial Ecology of Recycling and Reuse." Geyer and Jackson. *California Management Review*. Winter 2004. Available on course web site.
- "Strategic Management of Product Recovery." Toffel. *California Management Review*. Winter 2004. Available on course web site.
- "Poison PCs and Toxic TVs." Silicon Valley Toxics Coalition.

Background Readings on Incentives (Available Online)

- "Servicizing the Chemical Supply Chain." Reiskin, E.D., A.L. White, J.K. Johnson and T.J. Votta. *Journal of Industrial Ecology*. 3(2&3): 19-31. 2000.
- Or, see the full report on servicizing and Extended Producer Responsibility at www.tellus.org.

In-Class Discussion Assignment

- Visit: www.chemicalstrategies.org; analyze the environmental and competitive implications of this program.
- Why has this program taken hold primarily in the chemical industry so far? What characteristics of the chemical industry make it suitable for "chemical management services" programs? What other industries might be good candidates? Do you know of other examples?

SESSION 8

Environment, Accounting and Finance

Issues

- Does it pay to be green?
- Green investing
- How to measure environmental performance?
- Green accounting
- Environmental reports

Readings on Environmental Accounting

- *Finding Cost-Effective Pollution Prevention Initiatives: Incorporating Environmental Costs into Business Decision Making*. Global Environmental Management Initiative (GEMI). 1994. Available at: http://www.gemi.org/COS_107.pdf.
- "Improving Environmental Management with Full Environmental Cost Accounting." Epstein. *Environmental Quality Management*. 1996.
- "Using a Balanced Scorecard to Implement Sustainability." Epstein and Wisner. *Environmental Quality Management*. 2001.

Readings on Financial Impact of Environmental Management

- "Does the Market Value Environmental Performance?" S. Konar and M.A. Cohen. *Review of Economics and Statistics*. 83(2). 2001.
- "Eco-Value, Sustainability and Shareholder Value: Driving Environmental Performance to the Bottom Line." Kiernan. *Environmental Quality Management*. Summer 2001.

In-Class Discussion Assignment

- Visit the websites listed below and form a well-reasoned opinion of whether, when and how environmental performance is linked to financial performance.
- Look at some online corporate environmental reports and assess how well they do in measuring and reporting their environmental performance. How much is real, how much is greenwash?

Websites to Visit

- http://www.innovestgroup.com
- http://www.environmental-performance.org/index.php
- http://www.irrc.org
- http://www.sustainability-index.com/

SESSION 9

Sustainable Development and International Business

Case: Freeport Indonesia

In 1996, PT Freeport Indonesia, the mining subsidiary of Freeport McMoRan, had just completed an expansion of its copper and gold mine in the western half of New Guinea. The mine, which had dealt with numerous environmental and socio-cultural problems over the past couple of years, had recently proposed concrete plans for dealing with problems of acid drainage and spoils deposition. Now, although under widespread criticism and attack, the company is undergoing environmental and social audits and is again contemplating a major expansion.

Case Questions

1. Describe and evaluate PTFI's environmental management strategy. Is environment part of the parent company's general corporate strategy? (See http://www.fcx.com.) Has it always been?
2. Describe and evaluate PTFI's treatment of social and cultural affairs in Irian Jaya.
3. Would you describe this project as "sustainable"? What criteria would you use to evaluate this claim? Compare how economic rents are being distributed under PTFI's stewardship with your sustainability criteria.
4. Should the Indonesian government allow PTFI to expand?
5. Are these issues relevant only for a large-scale operation such as this?

Reading

- "Beyond Greening: Strategies for a Sustainable World." Hart. *Harvard Business Review*. 1997.

Not much to read today, to give you extra time to work on your projects! Check the following website; you will enjoy it!

- http://scorecard.org

SESSION 10

Project Presentations

Presentation of Group Projects

CHARLES J. CORBETT

Charles J. Corbett is an associate professor of operations management and environmental management at the UCLA Anderson School of Management, and was AT&T Faculty Fellow of Industrial Ecology in 1998-1999. He received a Drs. (MSc equivalent) degree in operations research from the Erasmus University in Rotterdam and an MSc and PhD in Production and Operations Management from INSEAD in Fontainebleau, France. His current research focuses on supply-chain management, on environmental issues in business, and on operations in small businesses. At UCLA, he teaches courses on operations management, global operations strategy, environmental management, and business plan development, in the MBA, FEMBA, and EMBA programs. In 2002, he received the George L. Robbins assistant professor teaching award. He was recently appointed Associate Dean for the MBA program at the Anderson School.

He has published in academic and business journals in several countries, including *Sloan Management Review, California Management Review, Operations Research, Management Science, European Journal of Operational Research, the Journal of the Operational Research Society, Environmental and Resource Economics, L'Impresa* and *L'Impresa Ambiente (Italy), Estrategia Financiera (Spain), Bedrijfskunde (The Netherlands),* and *Het Ingenieursblad (Belgium)*. Dr. Corbett is an associate editor of *Operations Research*, former associate editor of *Management Science*, area editor and guest editor of a double special issue on Environmental Management and Operations for *Production and Operations Management*, a member of the editorial board of *Manufacturing and Service Operations Management*, and frequently acts as referee for a wide range of journals.

Before joining the Anderson School, Dr. Corbett was Visiting Scholar at the Owen Graduate School of Management at Vanderbilt University. He has presented seminars and taught guest classes at universities worldwide, including a version of his Business and Environment elective in the MBA program at Pontificia Universidad Catolica in Santiago, Chile.

Dr. Corbett is a citizen of the United Kingdom and of the Netherlands, has lived in France for 5 years, and is currently a resident alien in the United States.