

ECON 260 Environmental and Natural Resource Economics, Spring 2006

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Office Hrs: Weds 10:00-11:30
 Thurs 9:30-11:00
 or by appointment

Course Materials

- (G) Goodstein, Eban. *Economics and the Environment*, Fourth Edition (John Wiley & Sons: 2004)
(B) Barnes, Peter *Who Owns the Sky?* (Island Press: 2001)
(R) Reserve readings: these are generally accessible on-line or at my web disk.

Grading

Class Participation (includes quizzes & presentation)	15%
Mid-terms	40%
Final Exam	25%
Research Paper	20%

Academic Honesty

I encourage you to study together, discuss the material, prepare for examinations together, and proofread each other's papers. It is important, however, that you know where to draw the line between beneficial collaboration and plagiarism, cheating and other forms of academic dishonesty. I take this issue very seriously; in recent years, several students have earned failing grades in my class following a cheating or plagiarism episode. If you have any questions about where this line is I encourage you to come and talk to me about it. Also make sure that you have read and that you understand the statement in *The Pathfinder* entitled *Academic Integrity Policy and Procedures*: http://www.lclark.edu/~stlife/judicial/pdf/code_of_conduct02.pdf.

Organization

The course is organized around the four questions in my book:

HOW MUCH POLLUTION IS TOO MUCH?
IS GOVERNMENT UP TO THE JOB?
HOW CAN WE DO BETTER?
RESOLVING GLOBAL ISSUES

You are responsible for all of the assigned reading material; homework problems at the end of each chapter in the book and additional problems that I provide will help you focus. Prior to class each Tuesday, you will need to complete an on-line reading quiz covering the material from the textbook for that week (Tuesday and Thursday). Also on Tuesday you must bring to class a completed reading guide for the text. (Download a copy for each week from my webdisk) On an honor system, each Tuesday I will ask you to indicate on a sign-in sheet if you completed this assignment. I expect that each of you will miss a day or two. Please let me know truthfully.

Exams and Homework

There will be one in-class and one take-home midterm, and one cumulative final exam (5/1 8:30-11:30). The best way to study for these will be to keep up with the homework assignments, and then review them. If you do not do the homework, you will do poorly in the class. Answers to many of the homework problems are on my web disk.

Finally, at the beginning of each class I welcome questions about the background reading, or any issues relating to environmental or natural resource economics happening outside the classroom.

Student Teams

Working in teams of three, students will lead a discussion of one set of the class readings. Your job will be:

- 1) In a ten minute presentation, summarize the thesis of the reading, and present the main evidence marshalled by the author to defend his or her point of view. The idea here is to provide an OVERVIEW—not a detailed book report. Focus your presentation on the two or three main points of evidence supporting the thesis.
- 2) In your presentation, discuss an article that challenges the thesis of the reading.
- 3) Develop a three question, MULTIPLE CHOICE test that tests basic reading comprehension for the assignment. This should be e-mailed to me by at least 3 pm the DAY BEFORE your class. Do not share this quiz with your classmates ahead of time!

On Friday, the week prior to the presentation, each team, having read their material should then come and consult with me during office hours (or over lunch?) about strategies for leading the class. I suggest using a power point presentation to organize your talk. Practice these presentations at least twice with your partners!

e-mail

Check your e-mail on a regular basis. You all should feel free to post articles or questions to our class list. I am always glad to see questions relating either to the course material, homework, or course organization, or to environmental economics as it applies to some current issue. I will try and answer the questions, either in class or on e-mail; others are welcome to respond as well.

Attendance

Each student is allowed two absences over the course of the term. Absences above this number will reduce your class participation grade.

Outside Events

There are two required evening events (one traded for class on 3/7)

*For the first event, class will be divided into two groups, each meeting for an hour and a half. Pollution trading game. **Wednesday, March 22nd**, Dubach Computer Lab.6:30-8:00 and 8:15-9:45

* The second event will be a presentation by Professor Randy Bluffstone, the **evening of March 9th**.

You can also receive extra credit for attending additional lectures on environmental or economic topics (up to 1.0 points on your final grade), and sending me via e-mail a one-paragraph write-up about what you learned. (1/3 point for each talk). There are lots of opportunities on campus, at the Law school, and in the Portland area. Special note: I am organizing a weekend conference on "Building the Movement to Stop Global Warming" with lots of talks, the weekend of 1/27.

I also HIGHLY RECOMMEND the annual economics Steinhardt Lecture by Professor Sam Bowles entitled: "The Weightless Economy: The Invisible Hand and the Communism of Ideas", 2/22, 7:30 pm.

Additional Extra Credit

I offer up to 1 point of extra credit applied to your final grade for completing any of the following EC homework problems from the textbook. To complete these, you will need to read sections of the text not relating to material we will cover in class. I am glad to talk with you about them during office hours. Each well done answer adds ½ point to your final grade.

1. Explain to me under what conditions, using a game theory approach, the SMS strategy "usually minimizes the costs of being wrong". (Appendix 7A)
2. Application 19A.0 from the appendix.

Finally, if you turn your final project into a **Poster Presentation** at the ENVS spring gathering, you can earn up to 2 additional Extra Credit points.

READINGS

Week 1

I. INTRODUCTION: Global Warming

1/17:

(G) 1. Four Economic Questions

1/19:

(G) 2. Ethics and Economics

(R) "Knowledge" and "Spirit" Chapters 3 and 4 in my new book.

II. HOW MUCH POLLUTION IS TOO MUCH?

Week 2

1/24:

(G) 3. Pollution As An Externality

1/26:

Presentation, Group 1 ((R) Matson and Goodstein

(G) 4. The Efficiency Standard

Week 3

1/31:

(R) "Two Nobelists: A Coase for Rejoicing", WSJ, 10/17/91. Webdisk.

(B) Chapters 1-4

(R) "Summary of Measure 37"

<http://www.law.georgetown.edu/gelpi/takings/stateleg/Measure37.htm>

2/2:

Presentation: Group 2 (R) Measure 37 Overturned, PRO and CON, and Parsing the Economics. Webdisk.

And (R) "Judge Razes Measure 37 Law"

http://www.oregonlive.com/news/oregonian/index.ssf?/base/front_page/112937422680310.xml&coll=7

(G) 5. The Safety Standard

(G) 13. An Overview of Environmental Legislation

Week 4

2/7:

(G) 6. Neoclassical Sustainability

2/9:

Presentation: Group 3: (R) "The Distribution of Pollution" (Brooks and Sethi) *Journal of Environmental Economics and Management*, 32-233-250 (1997). Webdisk.

(R) 3.1- 3.2 pages 13-26. "Policy Applications of Environmental Accounting"
(Lange) <http://siteresources.worldbank.org/INTEEI/214584-1112739235956/20486189/PolicyApplicationsofEnvironmentalAccounting2003.pdf>

Week 5

2/14: First Exam: In-class

2/16: Presentation: Group 4 (R) THE GENUINE PROGRESS INDICATOR 2000 UPDATE by Clifford (Cobb, Glickman, and Cheslog)
http://www.rprogress.org/newpubs/2001/2000_gpi_update.pdf
And *For the Common Good*, (Daly and Cobb) pp. 401-416, and pp. 425-441(descriptions of columns O through U). Webdisk.

(G) 7. Ecological Sustainability
(R) *Skeptical Environmentalist*, pp. 50-87 (Lomborg)

Week 6

2/21: (R) *The Ecology of Commerce, Chapter 1* (Hawken)
(B) Chapters 6-8

2/23: Presentation: Group 5 (R) *The Overspent American*, Ch 4,5 and Epilogue. (Schor) Webdisk.
(G) 11. Is More Really Better?

Week 7

2/28 (G) 8. Measuring the Benefits of Environmental Protection, and Appendix 8A (skip first section, read about the experiment)

3/2: (R) Economic Effects of Riparian Corridors and Upland Wildlife Habitat Netusil <http://www.reed.edu/~netusil/RiparianQuality-Fanno.pdf>
(R) "Unnatural Markets", Ackerman and Heinzerling. Webdisk.

Week 8

3/7: NO CLASS

3/9 Presentation: Group 6: Whitmore Thesis

(G) 9. Measuring the Costs of Environmental Protection
SKIM pp. 165-170.

(G) 10. Benefit-Cost in Practice

Evening Presentation: Professor Randy Bluffstone

Week 9

III. IS GOVERNMENT UP TO THE JOB?

3/14: (G) 12. The Political Economy Of Environmental Regulation
(G) 14. The Regulatory Record
(G) 15. Monitoring and Enforcement

IV. HOW CAN WE DO BETTER?

3/16: NOTE CLASS BEGINS AT NOON TODAY
Presentation: Group 7 (R) "Prices without Values", Ackerman and Heinzerling. Webdisk.

(G) 16. Incentive-Based Regulation: Theory

Week 10

3/21: (G) Appendix 16A
(B) Chapter 5

3/22 POLLUTION TRADING GAME: Evening sessions

3/23 Presentation: Group 8--- (R) "CO2 Allowance Allocation in the Regional Greenhouse Gas Initiative and the Effect on Electricity Investors" Burtraw, Kahn and Palmer. Webdisk.

(G) 17. Incentive-Based Regulation: Practice

(R) "Is Gasoline Undertaxed in the United States?" Ian Parry (Resources, Summer 2002) <http://www.rff.org/Documents/RFF-Resources-148-gasoline.pdf>

Second mid-term: take home due 3/24 at 5pm

Week 11

4/4 (G) 18. Promoting Clean Technology: Theory
(G) 19. Promoting Clean Technology: Practice

4/6 Presentation: Group 9: "The New Harvest: Biofuels and Wind Power for Rural Revitalization and National Energy Security" (Mazza and Heitz)
<http://www.climatesolutions.org/pubs/pdfs/TheNewHarvest.pdf>

(G) 20. Energy Policy and the Environment
(R) About Fuel Cells <http://www.ectechinc.co.uk/BASICS.HTML>

Week 12

V. RESOLVING GLOBAL ISSUES

4/11: (G) 21. Poverty, Population and The Environment
(R) "World Population Prospects: The 2002 Revision" (UN) pages i-ix.
<http://www.un.org/esa/population/publications/wpp2002/WPP2002-HIGHLIGHTSrev1.PDF>

4/13: Presentation: Group 10 "Peak Oil Forum" (five short articles in *Worldwatch*)
Webdisk.

(G) 22. Environmental Policy in Poor Countries
Film excerpts in Class: "Trading Democracy" (Bill Moyers)

Week 13

4/18: (G) 21. Global Agreements
Outside speaker: TBA

4/20: Presentation: Group 11 Herman Daly, Farewell Speech at the World Bank
<http://www.whirledbank.org/ourwords/daly.html> & "Bridging the Trade-Environment Divide", Esty
<http://www.sice.oas.org/geograph/environment/esty.asp>

Week 14

4/25:

(R) “Global warming Economics”, Nordhaus, *Science*

http://www.econ.yale.edu/~nordhaus/homepage/nordhaus_science_110901.pdf

“You’re Getting Warmer: The Most Feasible Path for Addressing Global Climate Change Does Run Through Kyoto” Frankel

<http://ksghome.harvard.edu/~jfrankel/FEEMyoureGettingWarmer.PDF>

WRITING ASSIGNMENT

You have a choice of major writing assignments. You can either write a research paper, or work in a group on a Clean Technology project. For both drafts and papers, I encourage you to use recycled paper, and to print two pages on a side. (Specify “2” for the number of pages per sheet in the Word print menu).

I. Research Paper

The paper should be between 15 and 20 pages in length, double-spaced. There are four deadlines associated with the paper:

1. **Question.** A specific question, or hypothesis, which your paper will answer must be developed by **February 28th**

Your hypothesis must be an actual question (ending with a question mark!) that is one sentence in length. Examples: Should the Portland metro area loosen its zoning boundaries to accommodate growth? Are landless peasants or commercial loggers contributing more to Amazonian deforestation? Which would be a better approach to dealing with medical waste: recycling or incineration? Given the uncertainty associated with global warming, should we take aggressive control measures now or wait for better information? Is retiring dams an economically feasible way to promote salmon recovery?

To develop a topic, you should read 3-4 newspaper or magazine articles in an area you find interesting. Among other places, look at *Environment* magazine, *The Economist*, *The EPA Journal*, *Sierra*, *Garbage*, *Audobon* or *E-Magazine*. Also, look in the index to your textbook, and read all the references to your problem that are listed there. Then you'll be prepared for any possible question I could ask!

Beginning on February 28th, I will schedule a time with each student in which they will make a brief presentation to me on their ideas for a topic, and what they hope to discover over the course of the semester. The same day as our meeting, you should hand in a one page paper (maximum) which states your hypothesis.

2. Sources. A list of at least 15 sources should be turned in on **March 21st**. Typically, you will find four types of sources:

- (1) Books.
- (2) Articles in specialty print journals (eg *The Journal of Environmental Economics and Management*, *Land Economics*, *The EPA Journal*). These articles are “peer-reviewed” meaning they have been read by “expert” third parties, and checked for factual and logical inaccuracies. To find these articles, use the “econlit” database in Firstsearch (from the library home page), or try Google’s “scholar” search.
- (3) Articles in general interest print journals (eg *Time*, *The Economist*, or newspapers like *the New York Times* or *Wall Street Journal*).
- (4) Web-based articles published by research institutions (Resources for the Future: www.rff.org; World Resources Institute: www.wri.org; EPA: www.epa.gov; World Bank: www.worldbank.org/nipr/; For a fuller list, visit the resources link at my web site: www.lclark.edu/~eban) Note that web-based articles often come from partisan sources,

and are often not peer-reviewed. When searching for information on the internet, beware of digging up garbage. For example, a search on “global warming” is liable to turn up a lot of writing that is long on political rhetoric but short on economic analysis.

If you are having trouble finding sources, get help from the reference librarian.

3. Short Draft. You should develop a 4-6-page version (6 -page maximum) of your paper, to be brought to class **on April 13th**. This should be a completed paper, not an outline. Somewhere in the first paragraph should be your one-sentence question; the last paragraph should consist of a tentative answer to that question, supported by the argument you have developed in your paper.

Bring two copies of your paper, one for me and one for a fellow student. Over the weekend, we will both comment on the paper, returning our comments to you on April 16th. I expect well written papers. Up to a full grade will be deducted for incorrect spelling, bad grammar, incomplete sentences, and poor organization. If you need help, make use of the tutors available in the writing center. Of course, I would be glad to discuss any aspect of your paper with you.

4. Final Paper. The finished version of the paper should be turned in by 5 pm on the last day of class. The paper should begin with a **1 paragraph abstract**, stating the question the paper addresses, and your conclusion. As with the short paper, somewhere in the first couple of paragraphs of your full paper should be your one-sentence question; the last paragraph or so should consist of an answer to that question, supported by the argument you have developed in your paper. If this sounds like a boring way to write, don't worry about that: clarity beats cuteness in just about everybody's book! (Of course clear and cute is the best combo).

In addition to meeting deadlines, your grade will be determined by (1) the quality of the five-page draft, and (2) the quality of the final paper. Both the outline and the paper should be proofread carefully for spelling, organization, and grammatical errors. The paper is a major part of your grade. Take it seriously! If you need help at any stage come talk to me, or you can consult the tutors at the Writing Center. Late papers will be downgraded one letter grade for every late day.

II. Clean Technology Project

One of the themes of this course is that achieving a sustainable future will require rapid development of clean technologies. These technologies will be needed over the medium term to accommodate the impact of both rapidly rising population and consumption per person. Clean technologies have two key features: they are environmentally superior to existing technologies, and they cost no more (or not much more) than existing technologies. The second feature is required to get people to adopt the technologies widely, so they can have a positive impact on environmental quality.

This project asks you to help explore the potential for a clean technology initiative at Lewis and Clark, by analyzing clean technologies which might be adopted by some or all members of the college community. Specifically, you must first determine both environmental and economic benefits from your proposed change in technologies. Second, you must outline a procedure for obtaining adoption of the new technology by members of the campus community. Some examples from past classes have been: energy efficient overhead light bulbs, elevator motors, and exit sign lighting, water saving faucet heads, motion detectors in classrooms for turning off lights, increased use of recycled paper by campus departments, improvements in dorm heating efficiency, improvements in bus service leading to a reduction in car trips, and an on-campus pizza take-and bake service to cut back on car trips. A few potential projects are outlined briefly below. We can also discuss projects of your own design.

For this project, you can work in groups of two or three. Note that there are four deadlines associated with this project: the first one appears in only 4 weeks! So you'll need to get an early start. In the beginning, I expect that each group will want to meet with me at least once a week; I can help you with initial ideas, and suggestions on finding further information.

If you choose this option, recognize that group projects are both fun and challenging. On the challenge side, I will assign a single grade to all group members, regardless of the individual

contributions. This means that if one person in the group works much harder than the others, they will not receive special recognition in terms of the project evaluation for doing so. If you need help at any stage come talk to me.

A. Determine Environmental and Economic Benefits:

5 page draft: due 2/16 in class.
 10 page report: due 3/16 in class.

In the initial phase of the project, you must first identify and quantify the benefits of your clean technology. To prove that your idea is in fact a clean technology, you must calculate both the environmental benefits and the cost savings to the purchaser of the technology. In your report, you might have a table like the one below that was developed for replacing an elevator motor in a dormitory with a model that was 10% more energy efficient.

Environmental Benefits*	Sox	NOx	CO2
Annual reduction (lbs)	104	104	35831
Monetary Value**	\$41	\$90	\$16

*Assuming all power is produced from a coal fired generator. Conversions from Laitner and Goldberg (1996).
 ** Monetary values from Goodstein (1995: 303).

Economic Benefits*			
annual savings	Initial cost	payback period (YEARS)	10 yr PDV of Net Savings**
\$1,181	\$2,361	2.00	\$5,744

*Assuming the motor runs half of the year. **Assuming a 5% discount rate.

B. Develop and Implement a “Marketing Plan”

5 page draft marketing plan: due 4/6 in class.
 Final paper: due 4/25, 3 pm.

Once you have identified your clean technology, you need to develop a strategy for convincing consumers to adopt your technology. What are the major obstacles and how will they be overcome? If you are making a recommendation to the college, you will be expected to make a presentation to the relevant college committee. What kind of time tables, and specific actions do you recommend? Why? If you are trying to convince students, faculty or staff to buy your technology, than you can actually launch a green business, or at least lay the foundation for doing so. For example, the students who proposed the pizza take-and-bake service estimated the demand for the service via a survey, and worked with the Bon to get the service in place by the end of the semester.

All reports should be proofread for organization, spelling, and grammatical errors. All group members must be present at meetings in which we discuss the drafts. The reports are a major part of your grade, and will be graded based on: precision, thoroughness, clarity of the references, creativity and initiative. Take them seriously, and have fun!

Useful Conversion Tables

Pounds of emissions per Million BTU's

	NOx	SOx	CO2
Non-Electric			
Coal	0.3820	1.0580	207.0000
Ngas	0.1090	0.0200	118.0000
Light oil	0.1320	0.1260	167.0000
Aviation gas	1.7840	0.1910	87.0000
Dist Fuel	0.2290	0.0270	165.0000
jet fuel	0.0120	0.0008	173.0000
LPG	0.0740	0.0060	244.0000
gasoline	0.5490	0.0203	163.0000
Electric			
Coal	0.6000	0.6000	207.0000
Ngas	0.3750	0.0006	118.0000
Oil	0.6000	0.3000	162.0000

Coal	mBTU/kwh	0.0106
Oil	mBTU/gal	0.1250

Source: Laitner, Skip, and Marshall Goldberg (1996) *Colorado's Energy Future: Energy Efficiency and Renewable Energy Technologies as an Economic Development Strategy*, (Economic Research Associates: Alexandria, VA)

Guide to Oral Presentation

Organization

- _____ Begins with effective attention-getter
- _____ Uses audiovisual aids when appropriate
- _____ Previews subject or viewpoint
- _____ Presents 2 to 5 specific points

Supports each point with data:

POINT 1:

POINT 2:

POINT 3:

- _____ Reviews subject, viewpoint, or discussion points
- _____ Concludes with memorable statement

Delivery

- _____ Steps up to speak with confidence
- _____ Begins without referring to notes
- _____ Maintains contact with audience
- _____ Sounds extemp, not read or memorized
- _____ Refers to note card only occasionally
- _____ Avoids *ah, so, ya know, well, like, and stuff, 'kay, etc.*
- _____ Doesn't look at floor, etc.
- _____ Doesn't pack up early

Time: _____