

THE UNIVERSITY OF SOUTHERN CALIFORNIA
Marshall School of Business
IOM 599 – Sustainable Supply Chains – Fall 2011

Time: Thursday, 12:30-1:50 pm
Instructor: Dr. Greys SOŠIĆ
E-mail: sosic@marshall.usc.edu
Office hours: Tuesday, 11:00-12:00 pm
Thursday, 2:00-3:00 pm

Room: JKP 212
Office: Bridge Hall 401E
Telephone: (213) 821-3632

COURSE SCOPE AND OBJECTIVES

Environmental issues and sustainability efforts can open many opportunities for businesses—product innovation can lead to first-mover advantage, environmental product differentiation can open new markets, green sourcing and waste reduction can reduce operating cost, etc. At the same time, they can present significant challenges—governments and communities are imposing higher standards on pollution, resource exploitation, etc.

This course aims to provide students with an understanding of the sustainability challenges and opportunities facing supply chains today. We will look at some of the factors that are contributing to the adoption of sustainability strategies, such as legislations that are penalizing negative environmental and social impacts, and society's expectations of business in terms of health, human rights, and the environment. The supply chains today cannot be concerned only with creating shareholder value; their performance is also measured in terms of social, environmental and economic impact. The main topics covered in the course are:

- ❖ Sustainability concepts and frameworks
- ❖ Global warming
- ❖ Environmental legislation
- ❖ Sustainable design of products
- ❖ Renewable energy
- ❖ Closed-loop supply chains
- ❖ Facilities and locations decisions
- ❖ Transportation decisions
- ❖ Supplier management
- ❖ Strategic sustainability implementation.

The class format includes lectures, case discussions, guest speakers, and movie clips.

COURSE MATERIALS

Required: *Course Reader (CR)* – Package of cases and readings available at USC bookstore. In the syllabus, a number such as CR#5 refers to 5th article in sequence in the course reader.

Handouts (HO): Handouts distributed in class.

Recommended:

- ❖ *Strategy for Sustainability: A Business Manifesto* by A. Werbach, HBP, 2009.
- ❖ *Earth, Inc.: Using Nature's Rules to Build Sustainable Profits*, G. Unruh, HBP, 2010.
- ❖ *The Ecology of Commerce: A Declaration of Sustainability* by P. Hawken, Harper Paperbacks,

2010

- ❖ *Cradle to Cradle: Remaking the Way We Make Things* by W. McDonough, M. Braungart, Noth Point Press, 2002.
 - ❖ *Eco-nomics: What Everyone Should Know About Economics and the Environment* by R. Stroup, Cato Institute, 2003
 - ❖ *Mid-Course Correction: Toward a Sustainable Enterprise* by R. Anderson, Peregrinzilla Press, 1999.
- ... and many others... You can also look at a number of journals, such as *Science*, *Nature*, *Scientific American*, etc.

Handouts will be posted on the Blackboard.

COURSE POLICIES

This course is mostly qualitative and uses cases for discussion of issues and illustration of approaches. Active participation in class is important throughout the course. It implies that you should read the assigned material before the session, think about the discussion questions, and hopefully find additional relevant material to share with the class. To ensure everyone's participation, I may at times resort to cold calling.

You should arrive to classroom on time. If you have conflicting schedules that prevent you from that, please let me know at the beginning of the semester.

Please bring a name tent (an 8.5x11" sheet folded in half lengthways, with your first and last name) and place it on your desk during each class.

GRADING

Group case reports (2)	30%
Individual submissions (8)	16%
Group project (1)	44%
Class participation	10%

GROUP CASE REPORTS

After the class roster is finalized, I will form the groups of 3-4 people. You will be working in these teams for the case write-ups. Each team is required to submit a report on two case studies (Interface's ESA on week 6, and McDonald's on week 12). The cases are to be discussed within your team; this Syllabus provides some questions that your report should address. Case write-ups should be at most 4 pages and single-spaced (11 or 12 point font), with appendices attached. The write-up should begin with an *executive summary* and be organized as follows:

1. *Brief* description of the company and its environment
2. *Brief* description of the problems and issues to be addressed.
3. Recommendations and implementation plan.
4. Analysis that discusses why the recommendations will solve the problems identified.

You may choose to organize the report differently; however, please ensure that the above aspects are covered and the report is well organized with clear section headers. Please avoid repetition of case facts and long expositions. General solutions to specific problems will get you little credit. Consider what and why you believe are the most important factors. Creativity in analysis and suggestions that are grounded in case facts will be given high credit. Please state any assumptions made clearly.

INDIVIDUAL SUBMISSIONS

In addition to the cases for which you are required to submit group reports, we will be discussing other cases and articles. You should be prepared for class discussion, and this Syllabus provides some suggested questions that you should address. For the individual submissions, please prepare a short write-up (less than one page, typed) answering the question(s) listed on p. 6. The objective of this short submission is to ensure that you prepare the case. For that reason, **no late submissions** will be accepted. If you are not able to attend the class, you can leave your submission in the Digital Dropbox **before** the class. If you are attending the class, please bring a hard copy of your submission and hand it in at the **beginning** of the class-I will not accept submissions at the end of the class. As long as your answer shows that you have given sufficient thought to the analysis, you will get full credit. I will **not** provide feedback on these submissions (unless your work is not satisfactory).

ON-LINE SUBMISSIONS

If you need to submit any files on-line, your submissions should be made through the Blackboard, Digital Dropbox option. The names of the files should contain your name(s) and assignment number. *Do not use symbols such as “#” in naming your files, because the Blackboard does not support them!* For instance, if you are submitting a word file for group assignment #2 and your group members are Black, Brown and White, the file should be called *BlackBrownWhite_2.doc*. If you do not follow these guidelines in naming your files, points will be deducted from your grade.

GROUP PROJECT

The class will have no exams; instead, you will prepare a final project. You should form teams of 3-4 people to work on that project. Ideally, no more than 2 people from the same discipline should be in the same group. The deliverables of the project are a final report and in-class presentation. There is no restriction on report length, but it should otherwise follow the guidelines given for the case reports. The timeline for the final project is the following:

- ❖ Week 3 – project teams formed and theme choices made (sent to me via e-mail)
- ❖ Week 4 – submit proposed project scope and sources for approval
- ❖ Week 8 – submit midway report and schedule a meeting with me for discussion of your work
- ❖ Week 13 and 15 – in-class presentation
- ❖ Week 16 – final report due.

Some suggested topics for your final project are:

1. USC is involved in a number of sustainability projects and activities (see <http://green.usc.edu>). Do you think USC is doing enough? How is it involving its partners across corresponding supply chains? You can criticize some of the current projects, or identify some new ones. In the first case, identify all potential shortcomings and propose how they can be overcome; in the second case, identify all benefits and challenges of your suggestion. Please make sure that you justify your statements and conclusions.
2. Select a company or an industry, and discuss the impact that government regulation (e.g., carbon taxes/pricing, take-back legislation, etc.) have on its supply chains and the changes in their business strategies and operations. Your analysis could include facility location, distribution channels and networks, energy supply, manufacturing technology choices, material selection, recycling, supply network choices, etc. Please document and support your statements and suggestions with facts.
3. As discussed in the Genzyme case, LEED certification is based on collecting points that put a

company into appropriate brackets (Silver, Gold, and Platinum levels). Do you think that the current point system leads to best possible environmental impact? How are the companies deciding which points to pursue? Should the point structure differ across regions or industries to achieve specific goals? Should the criteria for point allocation be modified? Can you suggest some new/modified criteria? In your analysis, you should also provide some quantitative analysis (regression, optimization, etc) to support your statements/conclusions.

4. Select a company, describe its current environmental image, and propose a way in which the firm can improve it. Discuss all benefits and drawbacks of your proposal and its implementation. Include its impact on the financial results, environment, and society. You should also address implementation challenges with various stakeholders and across its entire supply chain. Please document and support your statements and suggestions with facts.
5. Many of the nature's resources are being significantly depleted and many species (animals and plants) face extinction. Pick an industry that is exploiting natural resources that are (or soon will be) reaching critical levels. Discuss the nature and the scope of this industry's impact on said natural resources. If the industry is doing anything to remedy the situation, then discuss pros and cons of those strategies. In addition, propose at least two alternative (currently not used) approaches to help the depletion of resources, and discuss their benefits and potential obstacles to their implementation. Please document and support your statements and suggestions with facts.

I would prefer no more than two groups working on the same topic, so you should pick your topic fast in order to get your first choice.

GROUP ASSIGNMENT AND GROUP PROJECT EVALUATION

Team assignments provide a valuable learning experience – how to work effectively and efficiently in groups, learning from others, and honing your ability to communicate to others. Although your team's grade depends on each member's efforts, some students can be tempted to let others carry their load. In order to provide an incentive for all students to make maximum contributions to the study group, you will be asked to grade each team member's contributions for your group assignments and for the final project. Your group grades will be adjusted to obtain an individual grade based on feedback about performance provided by other members of the group (see the group assessment forms posted on the Blackboard). If you do not submit your group assessment form, it is assumed that you have assigned a rating of 100% to all your group members. The forms can be submitted in person or via e-mail, but no later than Week 16.

CLASS PARTICIPATION

Class participation requires that you do the assigned readings, analyze the cases based on the questions given, and participate actively in class. I prefer substantive comments based on good analysis rather than brief, general comments that add little to the discussion and learning. If you are reluctant to talk in class but would like to show your preparation, please provide me with your analysis before class (Please send it through the Digital Dropbox). Be prepared to defend your suggestions or solutions with careful and thoughtful analysis!

GETTING HELP

If you have questions about any aspect of the course, you can always talk to me. If it is a quick question, you can contact me before or after the class. If you need more time or privacy, you can come to my office

hour. If you cannot make my office hours, you can contact me and we can arrange for an alternative time. The best way to reach me is by e-mail.

RETURN OF PAPERS

Graded paperwork that is unclaimed by a student will be discarded after 4 weeks. Students who miss class sessions when paperwork is returned are responsible for arranging for an appointment to retrieve the material. Disputes over graded material should be brought to my attention as soon as possible.

NOTICE ON ACADEMIC INTEGRITY

The use of unauthorized material, communication with fellow students during an examination, attempting to benefit from the work of another student, and similar behavior that defeats the intent of an examination or other class work is unacceptable to the University. It is often difficult to distinguish between a culpable act and inadvertent behavior resulting from the nervous tensions accompanying examinations. Where a clear violation has occurred, however, the instructor may disqualify the student's work as unacceptable and assign a failing mark on the paper.

Academic dishonesty includes: (*Faculty Handbook*, 1994: 21-22):

- Examination behavior - any use of external assistance during an examination shall be considered academically dishonest unless expressly permitted by the teacher.
- Fabrication - any intentional falsification or invention of data or citation in an academic exercise will be considered a violation of academic integrity.
- Plagiarism - the appropriation and subsequent passing off of another's ideas or words as one's own. If the words or ideas of another are used, acknowledgment of the original source must be made through recognized referencing practices.
- Other types of academic dishonesty - submitting a paper written by or obtained from another, using a paper or essay in more than one class without the teacher's express permission, obtaining a copy of an examination in advance without the knowledge and consent of the teacher, changing academic records outside of normal procedures and/or petitions, using another person to complete homework assignments or takehome exams without the knowledge or consent of the teacher.

FOR STUDENTS WITH DISABILITIES

Any student requesting academic accommodations based on a disability is required to register with Disability Services and Programs (DSP) each semester. A letter of verification for approved accommodations can be obtained from DSP. Please be sure the letter is delivered to me as early in the semester as possible.

STATEMENT ON TECHNOLOGY USE

Please note that communication devices such as cell phones, Blackberries, iPhones, etc. capable of sending and or receiving electronic communication and all entertainment devices such as iPods or other MP3 players are to be turned off and kept off throughout the class session. Receiving or sending communication or entertainment during class disrupts the learning environment and is rude to those around you. If you use your laptop for note-taking purposes, Internet connections are prohibited unless otherwise stated by the professor.

Course plan at a glance (tentative)

	Date	Topic	Readings	Cases	Submission
1	8/25	Introduction – What is Sustainability?	The political economy of carbon trading (CR#1)		
2	9/1	Sustainable supply chains	Green supply chains (CR#2) Don't tweak your supply chain (CR#3) Challenge of going green (CR#4)		Short #1 – carbon footprint assignment (p.7)
3	9/8	Design for environment		Xerox (CR#5)	Short #2 – Xerox (q.2)
4	9/15	Supply management		Starbucks (CR#6)	Short #3 – Starbucks (q.2)
5	9/22	Waste disposal and waste reduction		Allied Signal (CR#7)	Short #4 – Allied (q.1)
6	9/29	Recycling through lease and service agreements		Interface's ESA (CR#8)	Group #1-Interface's ESA
7	10/6	Facilities - Green building		Genzyme Center (CR#9)	Short #5 – Genzyme (q.3)
8	10/13	Guest speaker			
9	10/20	Sustainable transportation	Environmental enhancements in road vehicle technologies (CR#11)	SAS (CR#10)	Short #6 – sustainable transportation assignment (p.9)
10	10/27	Facility location and transportation	"Greening" transportation in the supply chain (CR#13)	FIJI (CR#12)	Short #7 – FIJI (q.4)
11	11/3	Renewable energy	Note on energy (CR#15)	Cape Wind (CR#14)	Short #8 – renewable energy assignment (p.9)
12	11/10	Bringing it together		McDonald's (CR#16)	Group #2– McDonald's
13	11/17	Final Project Presentations			
14	11/24	Thanksgiving - no classes			
15	12/1	Final Project Presentations			

Detailed course plan

Week 1 Introduction--What is sustainability?

Readings:

- *The Political Economy of Carbon Trading* (HBS #9-710-056)

Week 2 Sustainable supply chains

Readings:

- *Green Supply Chains* (UV #2048)
- *Don't Tweak Your Supply Chain-Rethink It End to End* (HBR #R1010C)
- *Challenge of Going Green* (HBR #94410)

Discussion Questions:

1. Many supply chain managers see sustainability as a constraint; how might it be an opportunity?
2. What are the benefits for a supply chain of being environmentally responsible?
3. What challenges in implementing environmental policies are supply chains facing?

- ❖ ***Carbon footprint assignment:*** Go to the Carbon Footprint Calculator webpage (<http://www.carbonfootprint.com/calculator.aspx>) and calculate your carbon footprint. Print the results page and hand it in at the beginning of the class (don't forget your name). Your Print function probably will not work, so you should use either the PrintScreen button, or the snipping tool. To see how to print a screenshot, go to <http://www.wikihow.com/Take-a-Screenshot-in-Microsoft-Windows>.

Week 3 Design for environment

Readings:

- *Xerox: Design for Environment* (HBS #9-749-022)

Discussion Questions:

1. How did Xerox reach the objective of "0% product waste and 0% process waste by 1997"? Is this an appropriate goal?
2. *What must Xerox do to its product delivery system if the goal is to be achieved? What changes will Xerox have to make in goals and incentives to achieve this?*
3. Without legislation, will this ever pay off for Xerox? Will it, in fact, be possible for Xerox to achieve?
4. Should Xerox price re-manufactured products at a discount?

Week 4 Supply management

Readings:

- *Starbucks Corporation: Building a Sustainable Supply Chain* (Stanford case #GS-54)

Discussion Questions:

1. What are the main issues that Starbucks faced with its supply base in 2005? How did it approach this problem?
2. *What are the main benefits from C.A.F.E. for Starbucks? For its suppliers?*
3. What are the main challenges in implementation of C.A.F.E.?

Week 5 Waste disposal and waste reduction**Readings:**

- *Allied Signal: Managing the Hazardous Waste Liability Risk* (HBS #9-793-044)

Discussion Questions:

1. *How have the government's hazardous waste regulations affected Allied Signal?*
2. Does Allied Signal's hazardous waste management strategy make sense? Why or why not?
3. What organizational capabilities are necessary to implement such a strategy?
4. Going forward through the mid-1990's, should Callahan recommend any changes to this system?

Week 6 Recycling through lease and service agreements**Readings:**

- *Interface's Evergreen Services Agreement* (HBS #9-603-112)

Discussion Questions:

1. What is the environmental (waste reduction) argument for servicing?
2. Should Interface move into service? Are they ready for it?
3. What does Evergreen Services Agreement offer? Why are negotiations braking down?
4. How should Hendrix resolve this dilemma? Should he discontinue ESA? Restructure it?

Case study report on Interface's ESA due at the beginning of class**Week 7 Facilities - Green building****Readings:**

- *Genzyme Center (A)* (HBS #9-610-008)

Discussion Questions:

1. If you were a major stakeholder at Genzyme, what would you think of Genzyme's interest in green building?
2. If you were Rick Mattilla, would you recommend that Genzyme make the additional investments required to enable Genzyme Center to achieve LEED Platinum status? Why or why not?
3. *If Genzyme decided to make the investment to achieve LEED Platinum status, what decision criteria should guide the decision of which features to select? Based on these criteria, which green features would you chose?*
4. Looking ahead to other building projects, what green building policy should Genzyme adopt? Should the policy differ for offices, labs, and manufacturing sites? Should the company adopt the same policy globally?

Week 8 Guest speaker**Week 9 Sustainable transportation****Readings:**

- *Environmental Enhancements in Road Vehicle Technologies* (Stanford case #OIT-74)
- *Scandinavian Airlines: The Green Engine Decision* (Ivey case #HBS #909M28)

Discussion Questions:

1. What are the environmental impacts of an aircraft engine performance? Which of these impacts were key in the DAC engine decision? What regulatory or market-based mechanisms did SAS need to consider that were related to those impacts?

2. What are the arguments for and against purchasing the more expensive green engines from the point of view of the director of aircraft and engine analysis? Of the SAS management team?
3. In your opinion, how does national culture affect corporate decision-making?
4. What external forces (e.g., competition, industry trends, regulatory structure) and internal forces (e.g., corporate culture, leadership and management style) were involved in SAS's decision on whether or not to purchase the green engines?
5. Should companies make environmentally responsible investments even if they do not have short-term payback?
6. Should the SAS management approve the purchase of the DAC engines at the time discussed in the case? If the approval was to be made today, would you make the same decision, given the recent trends in the airline industry?

❖ **Sustainable transportation assignment:** While hybrid *passenger cars* were available on the market by the late 1990's, when FedEx wanted to use hybrid *delivery trucks* for its fleet in 2000, they couldn't find any. While dual combustor (DAC) technology leads to lower emissions, when SAS wanted to purchase B-737 planes with DAC technology, they were not readily available. What might have been possible reasons for this?

Week 10 Facility location and transportation

Readings:

- *Fiji Water and Corporate Social Responsibility-Green Makeover or "Greenwashing"?* (Ivey case #909A08)

Discussion Questions:

1. What is ethical and socially responsible marketing and why should marketers be concerned about CSR and sustainability?
2. What factors contributed to the marketing success of FIJI Water?
3. What does it mean for FIJI to go carbon negative? How does one measure and report carbon footprints of products? Is the carbon footprint of FIJI Water big compared to other products?
4. *What is greenwashing and how can it be identified? Do you think FIJI Water is engaged in greenwashing? What could the company do to gain environmental credibility?*
5. Are the Fiji government's concerns about the "negative" contribution of the FIJI Water to the local economy justified? Does the company do enough to improve its relations with the Fiji government and the local community? What else should it do to improve those relations?

Week 11 Renewable energy

Readings:

- *Cape Wind: Offshore Wind Energy in the USA* (HBS #9-708-022)

Discussion Questions:

1. Is the Cape Wind Project a good idea? Why or why not?
2. If Nantucket sound is the wrong place for a wind farm, is there a right place?
3. Why is there so much opposition to the Cape Wind project? What behavioral forces are at work?
4. Should Cape Wind have anticipated this resistance? What could it have done differently to manage this resistance?

❖ **Renewable energy assignment:** Compare main benefits and drawbacks of solar and wind energy. Which one is likely to capture larger share of the market in the near future? Further down the road?

Week 12 Bringing it together**Readings:**

- *McDonald's Corporation: Managing a Sustainable Supply Chain* (HBS #9-907-414)

Discussion Questions:

1. How should McDonald's prioritize sustainability relative to the other supply chain goals (e.g., ensuring food safety and minimizing costs)? How well is its supply chain sustainability vision aligned with its business strategy?
2. How should McDonald's reconcile different sustainability expectations and priorities around the world with the understanding that local practices sometimes impact the global brand?
3. How should McDonald's engage suppliers, activists, and other stakeholders in its sustainable supply chain efforts?
4. How is sustainability affected by the consolidation occurring in the food industry and the longer-term relationships sought by the participants throughout the supply chain?

Case study report on McDonald's due at the beginning of class

Week 13 Final project presentations**Week 14 Thanksgiving****Week 15 Final project presentations**