

THE UNIVERSITY OF SOUTHERN CALIFORNIA
Marshall School of Business
IOM 505 (16298) – Sustainable Supply Chains – Fall 2013

Time:	Wednesdays, 6:30-9:30 pm	Room:	ACC236
Instructor:	Dr. Greys SOŠIĆ	Office:	Bridge Hall 401E
E-mail:	sosic@marshall.usc.edu	Telephone:	(213) 821-3632
Office hours:	Wednesday, 2:00-3:00 pm Thursday, 2:00-3:00 pm		

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
- ❖ Sustainable design of products
- ❖ Closed-loop supply chains
- ❖ Supplier management
- ❖ Facilities management
- ❖ Renewable energy
- ❖ Facilities and locations decisions
- ❖ Transportation decisions
- ❖ Strategic sustainability implementation.

The class format includes lectures, case discussions, 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 posted on the Blackboard.

Recommended:

- ❖ *Cradle to Cradle: Remaking the Way We Make Things* by W. McDonough, M. Braungart, Noth Point Press, 2002.

- ❖ *The Responsible Company* by Y. Chouinard and V. Stanley, Patagonia Books, 2012.
 - ❖ *Reinventing Fire: Bold Business Solutions for the New Energy Era*, by A. Lovins, Chelsea Green Publishing, 2011.
 - ❖ *Green to Gold: How Smart Companies Use Environmental Strategy to Innovate, Create Value, and Build Competitive Advantage* by D.C. Esty, A.S. Winston, Yale University Press, 2006.
 - ❖ *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.
 - ❖ *Natural Capitalism* by P. Hawken, A. Lovins, L.H. Lovins, Little, Brown and Company, 2008.
- ... and many others... You can also look at a number of journals, such as *Science*, *Nature*, *Scientific American*, etc.

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.

GRADING

Group case reports (2)	26%
Individual submissions (5 out of 7)	10%
Test	27%
Group project (1)	27%
Class participation	10%

GROUP CASE REPORTS

Please form teams of up four persons within the first two weeks. You will be working in these teams for the case write-ups. You should use the "Group" option on the Blackboard to join one of the teams. The cases are to be discussed within your team and you will submit (as a team) a written report. This Syllabus provides some suggested questions that you should address in your analysis. Each team is required to submit a report on two case studies (Remanufacturing on week 3, and REI on week 4). Imagine that you, as a consultant, have to study an organization and to come up with an identification of main issues and a set of recommendations. 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, about half page long, summarizing the most important problems and your recommendations. The rest of the report should be organized as follows:

1. Brief description of the company and its environment
2. Brief description of the problems and issues to be addressed (the questions in the syllabus related to the specific case should guide you in identifying those issues).
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 (a Word document, one half to one page length, font 10-12, 1.5 spacing, typed) answering the question(s) listed on p. 6. **You need to submit 5 out of 7 possible submissions.** The objective of this short submission is to ensure that you prepare the case. For that reason, **no late submissions** will be accepted. You should submit your assignment through the Blackboard **before** the class. As long as your answer shows that you have given sufficient thought to the analysis, you will get full credit.

TEST

There will be one test, scheduled for week 6. If there are extenuating circumstances that prevent you from taking the test, you must discuss the reason with me before the time of the test. You will not be given a make-up test unless you obtain a permission from me in advance. In addition, you must be able to document the extenuating circumstance. If you miss the test due to a medical emergency that can be documented and verified, then a make-up test will be given. Otherwise, a grade of zero will be given for the missed test. Note that a make-up test cannot be taken before the actual test date!

GROUP PROJECT

The class will have a group final project. 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.

In your project, you will analyze a supply chain of a company, Frog's Leap (CR#11), evaluate its sustainability efforts, and propose some ways for its improvements/continuation. In your analysis, you should address the following:

1. Briefly describe the company and its environment, and then describe the company's current environmental image.
2. How would you measure the company's efforts to become sustainable?
3. Is Frog's Leap a socially responsible business? How does it stack up against its wine industry peers? Against companies in other areas? Benchmark Frog's Leap against one winery of your choice, and against one business in the area of your choosing. Develop a balanced scorecard with the following benchmarks:
 - Market Share
 - Perceived Product or Service Quality
 - Customer Loyalty/Retention
 - Customer/Segment Profitability
 - Relative Price
 - Customer or Segment Lifecycle Value
 - Environmental Concern and Sustainability

and rate companies as High, Medium, or Low (5-3-1). Provide justification for each rating.

4. Evaluate Frog’s Leap strategy. Use financial ratios (from exhibits 4, 5, and 6) and VRIO analysis (list aspects of Frog’s Leap’s business that are considered to be resources and capabilities that support a sustainable competitive advantage and evaluate them) to support your evaluation. What is working well, and what can be improved?
5. Should Frog’s Leap try to grow or maintain their production, sales, profits, wealth, and social and environmental efforts? What should their sustainability action plan for the next 10-20 years contain? Use the following table with generic items from “Green to Gold” (Esty and Winston, p.259) and find potential problems and solutions that apply specifically to Frog’s Leap.

Problem	Opportunity
Seeing the trees but not the forest	<ul style="list-style-type: none"> - Know your own issues - Provide data and metrics - Partnerships and outside perspectives
Misunderstanding the market	<ul style="list-style-type: none"> - Fill a market need
Expecting a price premium	<ul style="list-style-type: none"> - Don’t pitch only the green attributes
Misunderstanding customers	<ul style="list-style-type: none"> - Know customer limits and drivers
Middle-management squeeze	<ul style="list-style-type: none"> - CEO commitment and guidance - Incentives - Engagement and training
Silo thinking	<ul style="list-style-type: none"> - Value chain thinking - Life Cycle Assessment - Design for Environment
Eco-isolation	<ul style="list-style-type: none"> - Broad-based executive commitment - Ownership at the operation level
Claims outpacing actions	<ul style="list-style-type: none"> - Data and verification - Internal vs. external goals
Surprises: Wasp stings and unintended consequences	<ul style="list-style-type: none"> - Value chain thinking - Pilot programs - Conservative estimate of wins - Sense of humor
Perfect is the enemy of good	<ul style="list-style-type: none"> - Anticipating and expecting tradeoffs - Extended perspectives
Inertia	<ul style="list-style-type: none"> - Vision - Execution in bite-sized chunks
Ignoring stakeholders	<ul style="list-style-type: none"> - Stakeholder maps - Partnerships - Know that feelings are facts
Failing to tell the story	<ul style="list-style-type: none"> - Storytelling, both internal and external - Training

Consider actions that are short-medium-long-term in nature. Discuss all benefits and drawbacks

of your proposals and their implementation. Include the impact on the financial results, environment, and society. You should also address implementation challenges with various stakeholders and across the entire supply chain. It is better to propose one or two concrete and well supported suggestions than to give multiple general ideas with poor analysis.

Please document and support all your statements and suggestions with facts.

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 Wednesday of Week 8.

ON-LINE SUBMISSIONS

All submissions should be made on-line through the Blackboard.

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 Blackboard). Be prepared to defend your suggestions or solutions!

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, or during the break. 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 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 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, iPads, iPhones, etc. capable of sending and or receiving electronic communication and all entertainment devices such as 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.

Course plan at a glance (tentative)

Week	Topic	Readings	Cases	Submission
1	Introduction – What is Sustainability? Sustainable supply chains	Green supply chains (CR#1) Don't tweak your supply chain (CR#2)		
2	Supply management End-of-life management		Starbucks (CR#3) Allied Signal (CR#4) Interface's ESA (CR#5)	Short #1 – Starbucks (q.2) Short #2 – Allied (q.2) Short #3 - Interface's ESA (q.1)
3	Design for environment Cradle-to-cradle		Happy Shrimp (HO)	Short #4 – Happy shrimp (q.5) Group #1 – Remanufacturing
4	Renewable energy Facilities - Green building	Note on energy (CR#6)	REI (CR#7) Genzyme Center (CR#8)	Group #2 – REI Short #5 – Genzyme (q.3)
5	Facility location and transportation Sustainable transportation	“Greening” transportation in the supply chain (CR#9)	FIJI (CR#10) FedEx (HO)	Short #6 – Fiji (q.2) Short #7 – FedEx (q.3)
6	Bringing it together-how to measure sustainability? Quiz			
7	Final Project Presentations		Frog's Leap (CR#11)	

Detailed course plan

Week 1 Introduction--What is sustainability?; Sustainable supply chains

Readings:

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

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?

Week 2 Supply management; End-of-life 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.?

- *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, should Callahan recommend any changes to this system?

- *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?

Week 3 Design for environment: Cradle to cradle

Readings:

- *Co-siting feasibility study and business plan of a sustainable shrimp farm in Rotterdam* (HO)

Discussion Questions:

1. What is co-siting? What are different business benefits for co-siting partners?
2. How should Greiner and Curtessi build sustainable barriers to entry into the business? What combination of brand, technology and partnerships would work best for them?
3. Will the Happy Shrimp Farm be able to sustain global growth?
4. How could Greiner and Curtessi grow the business sustainably, keeping their local stakeholders happy? Should they consider licensing their know how to others?
5. *What would competition for waste energy do to the cost economics of the projects? Clearly, others were starting to become interested in capturing residual heat, with projects such as residential heating and aquarium fish breeding, for example.*

Remanufacturing/refurbishing assignment:

Find a company that has developed a system for accepting returns of its products from its customers and refurbishes/remanufactures them for new sales to its customers. Analyze their program, collection/reverse logistics network, and incentives for old/new customers,

Discussion Questions:

1. Describe the implementation of the refurbishing/remanufacturing program in the company.
2. What is the policy of the peers in the industry with respect to remanufacturing/refurbishing?
3. What motivated the firm to start with this program?
4. How successful is the program? What are the main obstacles/issues in its implementation? What are your suggestions for overcoming them?
5. What are the main benefits from the program? How is the company taking advantage of them?
6. How is the company pricing re-manufactured products? Are they offering any discounts/incentives? What do you think about their policy?
7. How should they proceed with the program in the future? Should they expand/shrink the program? What changes do you recommend?
8. What external factors can have an impact on success/failure of the program?

Case study report on remanufacturing and refurbishing due at the beginning of classWeek 4 Renewable energy: Facilities - Green building**Readings:**

- *Note on energy* (Stanford case #E-302)
- *REI's Solar Energy Program* (Stanford case # BE17)

Discussion Questions:

1. Do you agree with the analytical approach taken by REI in evaluating Phase 2 solar installations? Refer to Exhibit 5 and the spreadsheet shown in Exhibit 6.
 2. Which economic assumptions are the most crucial in REI's financial assessment of potential new solar installations?
 3. If you disagree with parts of REI's approach as embodied in the spreadsheet in Exhibit 6, submit a modified IRR calculation that incorporates your recommended changes (If you agree with all parts of REI's approach, provide clear justifications for each part.) Perform this analysis for a store in California. Use marginal tax rates of 35% for federal and 8.8% for state. For depreciation in California, use a 200% declining balance method over 12 years (with straight line for the last 6 years. The percentage depreciation for years 1-6 is: 16.67, 13.89, 11.57, 9.65, 8.04, and 6.70. Depreciation for years 7-12 is 5.58% per year).
- *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?

Case study report on REI due at the beginning of class

Week 5 Facility location and transportation; Sustainable transportation;**Readings:**

- *“Greening” transportation in supply chains* (Sloan Management Review #SMR338)
- *FIJI Water : Carbon Negative?* (HBS #9-611-049)

Discussion Questions:

1. When the Resnicks acquired FIJI water in 2005, the bottled water industry was very crowded. Yet, FIJI water soon became the bestselling imported bottled water in the United States. What accounts for FIJI Water’s success?
 2. *What is greenwashing, and why do companies engage in greenwashing? How do you know when a claim is greenwashing?*
 3. In light of the lawsuit, what should FIJI Water do? Should it amend its carbon negative strategy?
 4. Suppose FIJI Water hired you to develop a negotiation strategy to use with the Fijian government. What strategy would you recommend?
- *FedEx and Environmental Defense: Hybrid Delivery Fleet* (HO)
- Discussion Questions:
1. The Toyota Prius and Honda Insight were introduced in the late 90’s. Why was there no hybrid delivery truck on the market when ED approached FedEx in 2000? Why might a firm overlook an opportunity to simultaneously increase its profit and provide public environmental benefits?
 2. What performance measures should ED use to define success? What should Eaton corporation use? What should FedEx use?
 3. *Suppose that the purchase price for a conventional medium delivery truck is \$40,000, and that both conventional and hybrid truck have similar weigh, capacity, and maintenance cost. Assume that the average annual mileage for a truck is 14,000, and that conventional truck makes 7 miles per gallon. FedEx typically replaces its trucks every ten years, and the government provides \$6,000 in incentives for commercial hybrid vehicles of the size FedEx is considering. Compute the maximum price FedEx should be willing to pay for a hybrid delivery truck. You can find historical diesel prices at <http://www.eia.gov/petroleum/gasdiesel/>.*
 4. How should FedEx modify its strategy to fully benefit from the conversion to a hybrid fleet?
- *Calculating carbon footprint*
<http://www.carbonfootprint.com/calculator.aspx>

(bring your computers to class; please collect and bring the information about your household energy consumption—electricity, gas, etc., and about your vehicle’s efficiency—mpg)

Week 6 Test; Bringing it together: how to measure sustainability?**Readings:**

- *Frog’s Leap Winery in 2011—The Sustainability Agenda* (NA0170))

Week 7 Final project presentations