

OPNS 525**Emerging Areas in Operations Management****Instructor:** Ozge Islegen**Class Location:** Jacobs 561**Office Location:** Jacobs 570**Class Time:** Friday, 8:00am-11:00am**E-mail:** o-islegen@kellogg.northwestern.edu**Office Hours:** By appointment**Phone:** (847) 467-3145**1. Course Description**

In this course, we will cover topics chosen from the areas of environmental and social responsibility, and operations management. In particular, we will explore new research ideas on the interface of environmental and energy economics, corporate social responsibility, and operations management.

The emphasis will be to establish a basis for the understanding of the key concepts in environmental and energy economics, corporate social responsibility, and of the recent contributions OM researchers made and can make in the near future on practical problems arising in these areas. Increasing public awareness on environmental, health and safety performance of businesses presses organizations to incorporate social and environmental concerns into their operational decisions. Anticipating extensive regulations controlling negative externalities and conserving resources, organizations are under growing pressure to reconsider their physical processes such as investment on energy efficiency, renewable energy resources, and green product development; their operational processes such as facility allocation, inventory management and logistics; and their interaction with their supply chain in changing these processes. With this motivation, the topics in this course will include the impact of government policies and regulations on firms, with a particular emphasis on how they impact the firm's operations.

The final part of the course focuses on the intersection of social responsibility and operations management. Socially responsible organizations also account for how their environmentally sustainable business practices interact with the society directly or indirectly affected by these processes. OM researchers face the challenge of incorporating these new considerations into the operational decision-making processes. The last module of the course will review the emerging literature in Management and Strategy, and Operations Management on corporate social responsibility and discuss potential new applications of OM/OR techniques to problems of high societal impact.

To take this course, it is essential to have some level mathematical/statistical maturity and willingness to read a broad range of material. There are no required texts for the course. Below is a list of the papers, book chapters, and other articles we will discuss in the course.

2. Grading

1. Class Participation 15%
2. Problem Sets and Referee Reports 15%
3. Paper Presentations 20%
4. Research Project 50% (Research Proposal, Presentation of the Research Project, Write-up for the Research Project)

3. Reading List

Week 1

Background for Environmental Economics and Environmental Policy

*Solow, R.M., 1991. "Sustainability: An Economist's Perspective." Eighteenth J. Seward Johnson Lecture to the Marine Policy Center, Woods Hole Oceanographic Institution, Woods Hole, Massachusetts. June 14, 1991.

http://www.isites.harvard.edu/fs/docs/icb.topic203569.files/Solow.Sustainability_An_Economists_Perspective.1993.pdf

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

<http://www2.econ.iastate.edu/classes/tsc220/hallam/Coase.pdf>

*Baumol, W. and W.E. Oates, 1990. The Theory of Environmental Policy. 2nd Ed., Cambridge, England. Cambridge Uni. Press. (Chapters 2 and 3).

Baumol, W. and W.E. Oates, 1990. The Theory of Environmental Policy. 2nd Ed., Cambridge, England. Cambridge Uni. Press. (Chapter 4).

* Stavins, R.N. 2008. "Environmental Economics." The New Palgrave Dictionary of Economics. 2nd Ed. Eds. Steven N. Durlauf and Lawrence E. Blume. London. Palgrave MacMillan.

http://www.dictionaryofeconomics.com/article?id=pde2008_E000096&edition=current&q=environmental%20economics&topicid=&result_number=1

Environmental Sustainability and Operations Management

*Kleindorfer, P.R., Singhal, K., L.N. Van Wassenhove. 2005. "Sustainable Operations Management." *Production & Operations Management*. 14 (4), 482–492.

<http://opim.wharton.upenn.edu/risk/downloads/06-04-PK.pdf>

*Corbett, C.J. and R.D., Klassen. 2006. "Extending the Horizons: Environmental Excellence as Key to Improving Operations." *Manufacturing & Service Operations Management* 8 (1), 5–22.

<http://msom.journal.informs.org/content/8/1/5.abstract>

Seuring, S., Müller, M., 2008. "From a Literature Review to a Conceptual Framework for Sustainable Supply Chain Management." *Journal of Cleaner Production*. 16 (15), 1699–1710.

<http://www.sciencedirect.com/science/article/pii/S095965260800111X>

Srivastava, S.K., 2007. "Green Supply-Chain Management: A State-of-the-art Literature Review." *International Journal of Management Reviews*. 9 (1), 53–80.

<http://onlinelibrary.wiley.com/doi/10.1111/j.1468-2370.2007.00202.x/abstract>

Plambeck, E.L. 2012. "Operations Management Challenges for Some "Clean-Tech" Firms." Stanford Graduate School of Business. Working Paper.

<http://faculty-gsb.stanford.edu/plambeck/Documents/EnvironmentOpswithname.pdf>

(This paper includes details about the firms discussed in the Energy Economics paper below.)

*Plambeck, E.L. 2012. "Reducing Greenhouse Gas Emissions through Operations and Supply Chain Management." *Energy Economics*. (34) S64-S74.

<http://www.sciencedirect.com/science/article/pii/S0140988312002010#>

Week 2

Choice of Regulations

*Holland, S., Hughes, J., and C., Knittel. 2009. "Greenhouse Gas Reductions under Low Carbon Fuel Standards?" *The American Economic Journal: Economic Policy* (1)1.

Goulder, L. H., and I.W.H. Parry. 2008. "Instrument Choice in Environmental Policy." *Review of Environmental Economics and Policy* (2)2.

Uncertainty in Regulations

*Weitzman, Martin. 1974. "Prices vs. Quantities," *Review of Economic Studies* (41) 447-491.

Pizer, William, 2002. "Combining Price and Quantity Controls to Mitigate Global Climate Change." *Journal of Public Economics* (85)3.

Islegen, O., Plambeck, E. and T., Taylor. "Variability in Emissions-Cost: Implications for Facility Location, Production and Trade." Working paper.

*Venables, A.J. 1985. "Trade and Trade Policy with Imperfect Competition: The Case of Identical Products and Free Entry." *Journal of International Economics* 19.

Week 3

Energy Markets

*Borenstein, S. 2000. "Understanding Competitive Pricing and Market Power in Wholesale Electricity Markets." *The Electricity Journal*. 13(6) 49-57.

Borenstein, S. 2002. "The Trouble with Electricity Markets: Understanding California's Restructuring Disaster." *The Journal of Economic Perspectives*. 16(1) 191-211.

*Bushnell, James, Erin Mansur and Celeste Saravia. 2008. "Vertical Arrangements, Market Structure, and Competition: An Analysis of Restructured U.S. Electricity Markets," *American Economic Review*, 98(1): 237-266.

*Islegen, O. and S. J., Reichelstein. 2011. Carbon Capture by Fossil Fuel Power Plants: An Economic Analysis. *Management Science*. 57(1) 21-39.

Week 4

Renewable Energy Resources

Intergovernmental Panel on Climate Change Working Group III. 2011. Special Report on Renewable Energy Sources and Climate Change Mitigation. <http://srren.ipcc-wg3.de/>

*Borenstein, S. 2012. "The Private and Public Economics of Renewable Electricity Generation," *Journal of Economic Perspectives*, American Economic Association. 26(1) 67-92.

Reichelstein, S.J., and M., Yornston. 2013. "The Prospects for Cost Competitive Solar PV Power." forthcoming in *Energy Policy*.

Callaway, D. and M., Fowle. 2009. "Greenhouse Gas Emissions Reductions from Wind Energy: Location, Location, Location?" <http://nature.berkeley.edu/~fowle/papers.html>.

*Joskow, P. "Comparing the Costs of Intermittent and Dispatchable Electricity Generation Technologies." Center for Energy and Environmental Research Working Paper. February, 2011.

*Islegen, O. and E.L., Plambeck. Capacity Leadership. Working Paper. http://www.kellogg.northwestern.edu/~media/Files/Faculty/Research/ArticlesBookChaptersWorkingPapers/Early_Capacity_v40-Names.ashx

Week 5

Real-Time Pricing and Demand Response Management

Reiss, P. and M.W. White. 2008. "What Changes Energy Consumption? Prices and Public Pressures." RAND Journal of Economics. 39(3) 636-663.

*Wolak, F. A. An Experimental Comparison of Critical Peak and Hourly Pricing: The PowerCentsDC Program. Working Paper. March, 2010. <http://sedc-coalition.eu/wp-content/uploads/2011/06/Wolak-10-03-15-PowerCentsDC-Paper.pdf>

*Holland, S. P. and E.T., Mansur. 2008. "Is Real-Time Pricing Green? The Environmental Impacts of Electricity Demand Variance." The Review of Economics and Statistics. 90(3) 550-561.

Borenstein, S. and S.P. Holland. 2005. "On the Efficiency of Competitive Electricity Markets with Time-Invariant Retail Prices." The RAND Journal of Economics. 36(3) 469-493.

Borenstein, S. 2012. "The Redistributive Impact of Non-Linear Electricity Pricing", American Economic Journal: Economic Policy. 4(3) 56-90.

Week 6

Technological Change

*"Reducing U.S. Greenhouse Emissions: How much at What Cost? Executive Summary" McKinsey Report. http://www.mckinsey.com/client_service/sustainability/latest_thinking/reducing_us_greenhouse_gas_emissions

*Jaffe, A.B., Newell, R.G., and R.N., Stavins. 2003. "Technological change and the environment". Eds. Maler, K.G., Vincent, J., Handbook of Environmental Economics. Handbooks in Economics Series (Series Eds. Arrow, K.J., Intriligator, M.D.), (1) North-Holland/Elsevier, Amsterdam. 461-516.

Acemoglu, D., Aghion, P., Bursztyn, L. and D., Hemous. 2012. "The Environment and Directed Technical Change." American Economic Review, American Economic Association, 102(1), 131-166.

Popp, D., R., Newell and A., Jaffe. 2010. "Energy, the Environment, and Technological Change," Eds. Hall, B. H. and N. Rosenberg, Handbook of the Economics of Innovation, North Holland. <http://fds.duke.edu/db/attachment/1682>

*Acemoglu, D., Akcigit, U., Hanley, D. and W., Kerr. Transition to Clean Technology. Working Paper. November 30, 2012 <http://economics.mit.edu/files/8540>

Week 7

Climate Change

"Climate change 2007: The Physical Science Basis", available at <http://www.slwvd.com/agendas/Full/2007/06-07-07/Item%2010b.pdf>

"North America: Impacts, Adaptation & Vulnerability" available at <http://www.ipcc-wg2.gov/AR4/website/14.pdf>

"Climate change facts" available at http://www.epa.gov/climatechange/downloads/Climate_Change_Science_Facts.pdf

Economics of Climate Change

*Stern, N. 2008. "The Economics of Climate Change." American Economic Review (98).

*Nordhaus, W. 2007. "A Review of the Stern Review on the Economics of Climate Change," Journal of Economic Literature (45).

Weitzman, M. 2007. "A Review of the Stern Review on the Economics of Climate Change," Journal of Economic Literature (45).

*Weitzman, M. "On Modeling and Interpreting the Economics of Catastrophic Climate Change. Working paper. Harvard University. July, 2008.

Nordhaus, W.D. 2011. "Tail Events and Economic Analysis," Review of Environmental Economics and Policy. 5(2) 240-257.

Week 8

Corporate Social Responsibility

*Campbell, J.L. 2007. "Why Would Corporations Behave in Socially Responsible Ways? An Institutional Theory of Corporate Social Responsibility." Academy of Management Review. (32) 3 946-967.

Carroll, A.B. and K.M. Shabana. 2010. "The Business Case for Corporate Social Responsibility: A Review of Concepts, Research and Practice." International Journal of Management Reviews.

Kellogg Insight. 2013. "Being Smarter with CSR." Issue 71. March 4th, 2013. Northwestern University, Kellogg School of Management.

(There are four papers in this issue.)

<http://insight.kellogg.northwestern.edu/browse/issue/71/>

Ioannu, I., and G., Serafeim. The Consequences of Mandatory Corporate Sustainability Reporting. Working Paper. Harvard Business School.

http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1799589&rec=1&srcabs=1943690&alg=1&pos=1

Voluntary and Mandatory Environmental Disclosures

*F. Caro, C. Corbett, T. Tan, R. Zuidwijk. Double-Counting in Supply Chain Carbon Footprinting. Manufacturing and Service Operations Management, forthcoming.

http://personal.anderson.ucla.edu/felipe.caro/papers/pdf_FC16.pdf

*Kalkanci, B., Ang, E. and E. Plambeck. Measurement and Improvement of Social and Environmental Performance under Voluntary versus Mandatory Disclosure. Manuscript Submitted to Management Science.

<http://groups.haas.berkeley.edu/oitm/Papers/Spring%202013/Kalkanci-%20JMP.pdf>

Week 9

Responsible Supply Chain Management

*Guo, R., Lee, H. and R. Swinney. "The Impact of Supply Chain Structure on Responsible Sourcing." Working Paper. Stanford Graduate School of Business. January, 2013.

<http://www.stanford.edu/~swinney/ResponsibleSourcing.pdf>

*Plambeck, E.L., and T., Taylor. "Supplier Evasion of a Buyer's Audit: Implications for Auditing and Compliance with Labor and Environmental Standards." Working Paper. Haas School of Business, Berkeley. December, 2012.

http://haas.berkeley.edu/faculty/papers/taylor_evasion.pdf

*Jira, C.F., and M.W., Toffel. "Engaging Supply Chains in Climate Change." Working Paper. Harvard Business School. October, 2012.

http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1943690

Week 10 Presentations of Research Proposals