Strategic Approaches to Corporate Energy Efficiency

Draft 2.1

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Office Hours by Appointment

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Just refrigerator efficiency saves more energy than all that we're generating from renewables, excluding hydroelectric power... I cannot impress upon you how important energy efficiency is. It doesn't mean you eat lukewarm food and your beers are lukewarm. You can still have it; you just make a better thing.

– Stephen Chu, former Secretary, U.S. Department of Energy, Nobel Laureate in Physics

Today few doubt that reliance on fossil fuels is contributing to climate change, environmental disasters, and economic support for regimes that do not serve the interests of their populations and industrialized nations. It is also true that fossil fuels are and will remain critical to the quality of life many people have, or aspire to. How are corporations dealing with the reality of energy use today, with its political, environmental, and financial concerns?

The most important strategic response to energy use that firms can take is energy efficiency (EE). The efficient use of energy is a hedge against price volatility and supply uncertainty, saves money when done well, and offers the fastest and most effective way to reduce greenhouse gas emissions. Over time an effective energy efficiency response by business will have an economic, political and social impact.

This course examines energy efficiency as a strategic solution to corporate financial, competitive, and sustainability goals. At the same time, how will EE be taken into account as a capital asset? How will companies quantify risk of energy efficiency investments? The course covers three topics: 1. Energy fundamentals for non-experts; 2. Corporate strategies for reducing energy consumption; and 3. Energy efficiency as a new market opportunity. Although there will be some technical materials this is a strategy course and does not presume expertise in energy nor the intention of entering the energy industry. Rather, we will focus on energy as a critical business input – much like financial inputs – to examine how efficiency strategies can manage this resource wisely to meet corporate goals.

COURSE REQUIREMENTS

READINGS are linked below. We will also host speakers from government and industry.

ASSIGNMENTS: This course is a collective learning class and students will be actively involved in the organization and discussion of topics each week.

GRADING

1. LEADING A CLASS: 25% (may be done with others). Students will be asked to present materials to the class based on readings and outside research, as well as to lead discussions with guests. When appropriate students should prepare discussion questions, slides that can be made available to the class, demonstration, conduct role play, hold a debate or use some other means for helping the class to understand an issue. I will work with you to define the topics.

2. RESEARCH PAPER: 25% Select a topic related to one of the subjects we will discuss during the quarter and research the issues/controversies/technologies/solutions more narrowly and deeply as we will have time only for a survey of topics. For example we will broadly discuss the opportunities arising from cloud-delivered energy services but you might write a paper about how Nest is performing actually accomplishing this or how Uber will affect the demand for new types of vehicles. Alternatively you may be interested in researching novel financial vehicles that support energy efficiency, or marketing strategies that promote energy efficient behaviors. Pick something that you would like to learn more about. As a guide plan on 4-7pp.

3. WHITE PAPER: 25% Students will write 4-6pp on a topic with instructor approval. The White Paper will be written for possible publication on the Energy Efficiency Center website and may include PowerPoint and graphics as well as a written document. White Papers identify a situation or problem, bring data to bear on it, and make a recommendation as to a course of action. White papers were originally government documents but are now used by businesses and think tanks to argue for products and policies. Think of it as a long editorial.

   Here are two takes on this
   http://www.mwknowles.com/free_articles/white_paper/white_paper.html and
   http://www.dirjournal.com/business-journal/how-to-write-a-white-paper/

   Examples: http://www.cree.com/products/pdf/cree_led_lifecycle_whitepaper.pdf
   http://www.scribd.com/doc/20536588/Calvert-White-Paper-The-Future-for-Alternative-Energy
   http://www.vmware.com/files/pdf/WhitePaper_ReducePowerConsumption.pdf
   http://www.nec.com/global/prod/express/library/pdf/idc_ecocenter.pdf

4. ENERGY EFFICIENCY PROPOSAL: 25%. This can be a solution for corporate application OR a proposal for a new product or service. The proposal should a. Analyze a problem or opportunity. b. Describe the solution and why it has promise for success. c. Examine the barriers (policy, financial, technical, competitive, etc.) your proposal might face. d. Explain how you would overcome these barriers. I recommend doing this assignment in groups of 3-5 people who have a variety of skills and experience. 15-25pp as appropriate. These will be presented to the class at the last class meeting. May be done as a group.

5. DISCUSSION BONUS: [+]Students are expected to attend class and to participate in a way that increases learning for everyone. Students who add appreciably to the learning of others through their participation in class will get a "+" added to their grade. For example if your grade tallies equal a B+ but you have been a thoughtful and active member of the class your final grade will be an A- recognizing your contribution to learning.

OVERVIEW OF COURSE

Class 1:	Introduction to the demand side and energy efficiency
Class 2:	Energy efficiency as a regulatory driver
Class 3:	The economic universe of energy efficiency decisions
Class 4:	Capital considerations
Class 5:	Innovations within the energy industry
Class 6:	Scaling up energy savings with new business strategies
Class 7:	Theories of consumer behavior and overcoming consumer reluctance to invest in efficiency
Class 8:	Packaging renewables and efficiency
Class 9:	International Markets
Class 10:	Review and student presentations

Detailed Schedule, Speakers[1], Activities, and Readings[2]

Class 1: Introduction to the demand side and energy efficiency

Understanding the transformation of energy into useful services.
Speaker: Meier
Readings:

- McKinsey article: http://besustainable.pbworks.com/f/McKinsey+Quarterly_How+the+world+should+invest+in+energy+efficiency.pdf
- Watch/Listen to the President's national science advisor speak on the energy-climate connection: http://www.youtube.com/watch?v=_07Lb76_4HE

Class 2: Energy efficiency as a regulatory driver

Global, national, and local policies impacting carbon emissions, adaptation, and resiliency.
Speaker: Andrew McAllister, California Energy Commission; Meier
Readings:

- The Kyoto protocol
- California Assembly Bill 39
- EPA Clean Air Act, Section 111d
- The Bumpy Road to Net Zero Energy: http://www.eceee.org/all-news/columnists/Alan_Meier/the-bumpy-road-to-net-zero-energy

Class 3: The economic universe of energy efficiency decisions

Tools to evaluate efficiency investments. How do efficiency investments differ from traditional investments?
Speaker: Meier
Readings:

- McKinsey & Company. 2007. *Reducing U.S. Greenhouse Emissions: How Much at What Cost?*. New York: McKinsey & Company.
- *The IEA Energy Efficiency Market Report 2014*

Class 4: Capital considerations

Energy efficiency assets, returns, and risks. The principal-agent problems related to energy efficiency.
Speaker: Nolan Zail, Senior Developer, West Village
Readings:

- International Energy Agency. 2007. *Mind the Gap: Quantifying Principal-Agent Problems in Energy Efficiency*. Paris: International Energy Agency.

[1] Not all speakers have confirmed.
[2] Most classes will also include readings from sections of Alan Meier's Lecture Notes, "Economics of Energy Efficiency". Most readings will be available on Smartsite.

Class 5: Innovations within the energy industry

Utilities will remain a major player in the energy efficiency ecosystem, but how will that role evolve?
Speakers: Elizabeth Brinton, PG&E, Jim Davis, Smart Grid Wired
Readings: TBA

Class 6: Scaling up energy savings with new business strategies

How can new efficiency technologies and service be successfully deployed in a skeptical marketplace?
Speakers: Carolyn Wiener, Program Manager, PG&E: Joe Steinberg, CEO, Ecofactor
Readings:

- *Potential Metrics for the Energy Star Climate Controls Program*, EPA 2014

Class 7: Theories of consumer behavior and overcoming consumer reluctance to invest in efficiency

Do rational consumers exist? Does the energy efficiency market differ from other markets? If you give customers a free, high-quality audit, then they will surely come, or will they?
Speakers: Benjamin Finkelor, Siva Gunda (UC Davis Energy Efficiency Center); Meier
Readings:

- Kahneman, Daniel. 2011. *Thinking, Fast and Slow*. Macmillan. (Chapters to be identified)

Class 8: Packaging renewables and efficiency

Can packaging sexy solar with boring efficiency yield greater energy savings and more rapid uptake?
Speaker: James Quazi, ex-VP Solar City; Meier
Readings:

- TBA

Class 9: International Markets

Why selling energy efficiency in China is totally unlike that in America. How the Fukushima tragedy in Japan jumpstarted efficiency activities.
Speakers: Margaret Wong, CEO McWong International, Meier
Readings:

- Overviews of energy efficiency markets in selected countries

Class 10: Review and student presentations