FINA 7371
The Energy Value Chain

Spring 2018

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The objectives of the course are:

- Understanding the major issues influencing the energy value chains
- Understanding how and why the energy value chains have evolved in the past, how and why they are likely to evolve in the future, and where to look for the most profitable investment opportunities
- Preparation and effective presentation of a position on a current energy issue

The course also serves as introduction to two other energy economics courses that deal in more depth with the upstream oil and gas industry and with refining and petrochemicals.

Instructor

The instructor is D. H. Bellman. Prior to working with the Global Energy Management Institute, Professor Bellman spent thirty-five years at Exxon. He gained experience in a wide variety of functions, from global strategic planning and investments, to acquiring raw materials, to plant operations, to sales. He earned a bachelor's degree in mechanical engineering at Duke University, and a master's degree in business administration at Stanford University.

Materials

Textbook: No required textbook

Case Studies: "Adapting to Climate Change: Suncor Energy and the Alberta Oil Sands"
"The Global Oil & Gas Industry"
"First Solar, Inc. in 2013"
"A123 Systems"
"Shaping the Future of Solar Power: Climate Change, Industrial Policy, Free Trade"

These cases should be obtained using the following link:
http://cb.hbsp.harvard.edu/cbmp/access/74180418

Course Outline

Requirements

1. Homework problems and case studies to discuss in class
2. Small team presentation of a current energy issue
3. Three tests, each on one section of the course
4. Brief take-home final exam essay

Office Hours

Mondays and Tuesdays, 4:30 to 5:15 p.m., by appointment

Extra Help If You Need it

Counseling and Psychological Services (CAPS) can help students who are having difficulties managing stress, adjusting to college, or feeling sad and hopeless. You can reach CAPS (www.uh.edu/caps) by calling 713-743-5454 during and after business hours for routine appointments or if you or someone you know is in crisis. Also, there is no appointment necessary for the "Let's Talk" program, which is a drop-in consultation service at convenient locations and hours around campus.
http://www.uh.edu/caps/outreach/lets_talk.html.

Class Schedule, Topics and Assignments

Section 1 (Global Supply & Demand, Hydrocarbon Resources, Climate Change, Prices)

Session 1 1/22/18

- Course overview
- Some Concepts
  - ⇒ Value chains
  - ⇒ Economic rent
- Primary and secondary energy sources
- Energy density, efficiency and experience

Read: International Energy Agency (IEA), Energy Efficiency Market Report 2016 (Executive Summary, 4 pages)

Session 2 1/29/18

- Global energy supply and demand
- Hydrocarbon origins and reserves

Read: National Intelligence Council, "Global Trends," (read "The Future Summarized")
- US Energy Information Administration (EIA) International Energy Outlook 2017, Executive Summary
- International Energy Agency (IEA), World Energy Outlook 2017 (Executive Summary)
- IEA, "Golden Rules for a Golden Age of Gas" (Executive Summary)
- Simmons, "Calculating Oil and Gas Reserves"
- Maugeri, "Oil – The Next Revolution," 2012 (Executive Summary)

Session 3 2/5/18

- Case content quiz
- Climate change
- Clean power
- Sustainability
- Group research presentations reminder

Read: IPCC, "Climate Change 2014, Summary for Policy Makers"
- Bloomberg, Paulson, Steyer, June 2014, "Risky Business,"
- Tierney, New York Times, Sept 11, 2007, "Feel Good Vs. Do Good On Climate"
- Friedman, New York Times, Sept 19, 2007, "Doha and Dalian"
- Cohen, New York Times, December 25, 2010, "Bundle Up, It's Global Warming"
- McKay, "Sustainable Energy – without the hot air," pages 2 – 18.

Preparation: "Adapting to Climate Change: Suncor Energy and the Alberta Oil Sands"

Session 4 2/12/18

- Commodity prices
  - ⇒ Degree of competition
  - ⇒ Price regimes
  - ⇒ Dynamics
- Group research presentations confirmed

Read: Al Husseni, "Lessons Learned From 2008"
- Wang & Aamoot, New York Times, June 27, 2008, "Your Brain Lies To You"

Preparation: Complete group formation and confirm topics

Session 5 2/19/18

- Homework discussion
- Speculation
- Electricity markets and prices
- Test #1 preview

Preparation: "Texas Price Crash" homework

Read: Pirrong, "Commodity Speculation: Good, Bad, Ugly?"

Section 2 (Oil, Gas and Coal)

Session 6 2/26/18

- Test #1 (On Global Supply & Demand, Hydrocarbon Resources, Climate Change, Prices)
- Oil and gas access and exploration
- Exploration decisions
- The value of information

Preparation: Study for Test #1

Session 7 3/5/18

- Review Test #1 results
- Oil and gas production and processing
- Oil and gas values
- Transactions and financial markets

Read: OSHA, "Basic Refinery Process: Read: Description and History, Part II"

Session 8 3/19/18

- Case content Quiz
- Logistics and trade
- Exploration and production agreements and fiscal systems
- Evolution of the global oil and gas industry
- "Global Oil & Gas Industry" case discussion
- Coal
- Test #2 Preview

Preparation: Inkpen & Moffett, "The Global Oil & Gas Industry," 2016
"Simpler World" homework

Read: University of Texas Center for Energy Economics, "NOC Performance", 2009
The Economist, April 3, 2013, "Supermajordämmerung"

Section 3 (Electric power and alternative energy sources)

Session 9 3/26/18

- Test #2 (on Oil, Gas and Coal)
- Electric power generation
- Electric power transmission, distribution and security

Preparation: Study for Test #2

Read: Edison Energy Institute, "Electricity 101," January 2011
Wikipedia, "Smart Grids"

Session 10 4/2/18

- Review Test #2 results
- Renewable energy sources and technology
- First set of trial presentations

Preparation: Initial research presentations

Read: Schwartz, "The Future of Clean Energy"
Hastings-Simon, Pinner, and Stuchtey, "Myths and Realities of Clean Technologies"
The Economist, February 25, 2017, "The world turned upside down"

Session 11 4/9/18

- Case content quiz
- Commercializing new technology
- Subsidy and regulation
- "First Solar" case discussion
- Second set of trial presentations

Preparation: "First Solar, Inc in 2013" case for discussion

Read: The Official Report of the Fukushima Nuclear Accident Independent Investigation Committee, pages 43 and 44, "The 'regulatory capture' of Japan's nuclear industry"

Session 12 4/16/18

- Case content quiz
- Transportation fuels
- Commercialization, scale and financing
- "A123 Systems" case discussion

Preparation: "A123 Systems" case for discussion

Read European Expert Group,"Future Transport Fuels", January 2011 (Executive Summary)
Gross, May 2, 2014,"Not Another Solydra?"

Session 13 4/23/18

- Case content quiz
- Industrial Policy, Free Trade (case discussion)
- Test #3 preview

Preparation: "Shaping the Future of Solar Power: Climate Change, Industrial Policy, Free Trade" case for discussion

Session 14 4/30/18

- Final exam paper requirements review
- Test #3 (On Electricity and Alternative Energy Sources)

Take-home exam due via email no later than 8:00 pm on May 7