The Energy Value Chain - FINA 4371/7371 – Fall 2021

Class Information

- Wednesdays 6:00pm-9:00pm : beginning August 25, 2020
- Classroom: MH 130

Instructor

Andrew Slaughter has taught energy-related courses at the University of Houston since August 2020, following a career in energy in Europe and North America. He has held management positions at major oil companies and with leading consulting and advisory firms. Andrew has also played a prominent role in industry research and policy advisory programmes for the US government. Most recently Andrew was Executive Director of the Research Center for Energy and Industrials with Deloitte Services LLP, in Houston. He started his career at Chevron Oil in the UK.

Summary

This course is designed to introduce students to the fundamentals of energy value chains, from energy production to energy use, including an understanding of the role of different forms of energy, market structures, investment dynamics and the evolving nature of the energy system. The course will cover oil and gas, electric power and renewable energy, including consideration of broader issues affecting energy such as the economic environment, climate change and sustainability.

Course Objectives

- Understand the current US and global energy market structure and its component value chains
- Understand how and why the energy value chains have evolved in the past, how and why they are likely to evolve in the future
- Understand the relationships between energy value chains and broader economic, policy, sustainability and societal trends
- Develop the ability to read, discuss, understand, analyse and present in written and verbal material issues affecting energy value chains and markets

Course Approach

The course will include a variety of learning activities including lectures, classroom discussions, case studies and individual and team projects.

Materials

Textbook: No required textbook

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

"First Solar, Inc. in 2013"

"Shaping the Future of Solar Power: Climate Change, Industrial Policy, Free Trade"

"The Global Oil & Gas Industry"

"A123 Systems Powering a Sustainable Future"

These case studies should be obtained using the following link, at a cost to each student of $4.25 per case:

https://hbsp.harvard.edu/import/843837

Grading

Grades will be based on a combination of in-class quizzes, based on the assigned case studies, an individual student research paper, and a team presentation project. Quizzes, the individual paper and the team project will each count for one-third of the final grade.

Class Topics

Date	**Topic**	
August 25	Introductions; Course overview and expectations; Introduction to critical concepts of energy and energy value chains; introduction to key drivers of the global energy system	
September 1	Energy markets supply and demand structure, trends and main drivers	
September 8	*Case Study - Adapting to Climate Change: Suncor Energy and the Alberta Oil Sands – quiz and discussion* Climate, Sustainability and ESG – implications for energy value chains	
September 15	Electric Power and Renewable Energy (1)	
September 22	*Case Study - First Solar, Inc. in 2013 – quiz and discussion* Electric Power and Renewable Energy (2)	
September 29	Electric Power and Renewable Energy (3) Coal	
October 6	*Case Study - Shaping the Future of Solar Power: Climate Change, Industrial Policy, Free Trade – quiz and discussion* Introduction to Oil and Gas	
October 13	Oil and Gas – Upstream	
October 20	*Case Study - The Global Oil & Gas Industry – quiz and discussion* Oil– Midstream and Downstream	
October 27	Transportation Fuels and the Future of Mobility	
November 3	*Case Study - A123 Systems Powering a Sustainable Future – quiz and discussion* Natural Gas – Midstream and Downstream	
November 10	Class time available to finalise team project presentations, no formal instruction	
November 17	Team project presentations (1)	
December 1	Team project presentation (2)	
Final exam	None	

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Project Assignments

Projects	Topic	Description	Deliverable
Individual	Research essay on changes in the structure of energy markets and energy value chains between the 2016-2020 period and what you expect for the 2021-2025 period.	Students will assess qualitatively and quantitatively the changing dynamics of energy markets and value chains between the two time periods focusing analysis on either 1) the world; 2) the USA; 3) China; or 4) the EU	10-15 page white paper (~5000 words)
Team	Value chain drivers	Student teams will select one energy value chain and analyse the main drivers for growth, investment and structural change, supported by data, evidence and credible outlooks	15 minute presentation by each team, followed by group Q&A