

SYLLABUS

Course: Shale Gas & LNG – Spring 2023 - Professor Susan L. Sakmar

Time: Wed. 7:30p-9:30p

Professor Sakmar

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Overview and Learning Objectives: This course explores the growing role natural gas is expected to play around the world in the context of several competing drivers, such as increased energy demand, environmental concerns, and energy security. The first half of the semester will focus on US shale gas, which by most accounts is a “game changer” that could be replicated around the world so long as the proper regulatory and environmental frameworks are put in place. The second half of the semester will explore the growing role LNG is expected to play as the “glue” linking global gas markets. Students will have the opportunity to explore a natural gas topic of their choice through their research paper.

The learning objectives of the course are: (1) to gain an understanding of the role of natural gas in the energy system and the regulatory frameworks that govern energy overall and shale gas and LNG in particular; (2) to recognize the competing policy drivers for natural gas, including energy demand, environmental concerns, and energy security; (3) to understand the geopolitical implications of natural gas and LNG; (4) to understand the opportunities and challenges for various LNG import and export projects around the world with a particular focus on the impact US LNG exports will have on global gas markets.

Book Requirements: Susan L. Sakmar, **Energy for the 21st Century: Opportunities and Challenges for Liquefied Natural Gas (LNG) (2013)**. The book is available for direct purchase from the publisher at www.e-elgar.com (hard back **ISBN-13:** 978-1782544234) or paperback (**ISBN-10:** 1782544232). The book is also available on Amazon.

Grades: The final grade will be weighted as follows:

50% - Research paper (due at end of semester)

50% - Research assignments, class participation, current events and attendance.

Research Paper: Each student will write a 15-page (max) term paper on a topic related to global gas markets. Students are free to develop a topic of their choice subject to professor approval. Students will submit an outline of their paper and will identify their paper topics to the class mid-semester.

Class discussions: Class participation in the seminar is both necessary and mandatory. Students are expected to complete assigned readings and be prepared for class.

Current events: Each student is required to turn in a “current event” news article relevant to some aspect of global gas markets every week or as assigned.

Research assignments: Several short (2-3 pages) written research assignments will be assigned throughout the semester. **The 1st Research assignment can be downloaded from the course website. Other research assignments will either be handed out to students at class and/or posted on-line for students to download.**

1. SHALE GAS DEVELOPMENT (First half of semester)

Overview of US and Global Shale Gas Development

The development of unconventional or shale gas in the United States has significantly altered the outlook for global energy markets. Since shale rock exists in almost every corner of the world, developments in the US shale gas industry are being closely watched as other countries begin to explore the extent of their own unconventional resources. While the potential for global shale gas development is significant, the industry faces a number of commercial, regulatory and environmental challenges that must be addressed.

Topics that will be covered in the course include:

- History and evolution of the shale gas industry – what is shale gas?
- Identify the key environmental issues related to hydraulic fracturing or “fracking,” including water contamination and management, earthquakes, and various landowner issues such as setbacks and earning the “social license” to operate.
- Analysis of the regulatory frameworks for US shale gas development with comparison of key shale producing states such as Texas and Pennsylvania.
- What is the potential for shale gas development globally and which countries have the most potential? What are the issues and challenges?
- Analysis of emerging regulatory frameworks for global shale gas development.

2. THE ROLE OF LNG IN GLOBAL GAS MARKETS (Second half of semester)

The second half of the semester will explore the growing role liquefied natural gas (LNG) is expected to play as the “glue” linking global gas markets. LNG is natural gas that has been cooled until it reaches a liquid state, which then allows it to be shipped around the world. As a direct result of the US shale gas “revolution,” the US has now emerged as a major exporter of LNG, with wide ranging consequences for global gas markets. What was once a niche market with very few players, LNG is now one of the fastest growing segments of the energy sector.

Topics that will be covered in the course include:

- The LNG value chain, including a discussion of the liquefaction process, LNG shipping, and the regasification process.
- The evolution of LNG markets including the history of LNG and an overview of the three major LNG markets.
- A description and overview of key LNG supply projects around the world.
- The primary markets driving LNG demand around the world.
- Key terms in LNG contracts and recent developments in the trade in LNG.
- Safety and environmental issues related to the construction of LNG terminals.
- The regulatory framework for US LNG projects.
- The prospects for US LNG exports and why the US is seen as the catalyst for dramatic change in global gas markets.

COURSE SCHEDULE AND ASSIGNMENTS

Part 1A **Course Overview and Global Gas Markets Overview**

These first few reading assignments discuss the role of natural gas (shale gas and LNG) in the global energy mix and are important to provide a foundation for class discussions throughout the semester.

Jan. 18 **Read LNG Book:** Chapter 1 (role of natgas) and Chapter 2 (LNG value chain)

Assignment: Research assignment 1 due

Current Events: Current event 1 due

Jan 25 **Read LNG Book:** Chapter 1 (role of natgas) and Chapter 2 (LNG value chain)

Assignment: Research assignment 2 due

Current Events: Current event 2 due

Part 1B **Shale Gas – Regulatory Frameworks and Environmental Issues**

Feb 01 **Read LNG Book:** Chapter 10 (shale gas and golden age of gas)

Assignment: Research assignment 3 due

Current Events: Current event 3 due

Feb 08 **Read LNG Book:** Chapter 10 (shale gas and golden age of gas)

Assignment: Research assignment 4 due

Current Events: Current event 4 due

Part 1C **Impact of Shale Gas on Global Gas Markets and US LNG Exports**

Feb 15 **Read LNG Book:** Chapter 11 (global shale gas and US LNG exports)

Assignment: Research assignment 5 due

Current Events: Current event 5 due

Feb 22 **Read LNG Book:** Chapter 11 (global shale gas and US LNG exports)

Assignment: Research assignment 6 due

Current Events: Current event 6 due

Part 2 **THE ROLE OF LNG IN GLOBAL GAS MARKETS**

Mar 01 **Read LNG Book:** Chap 3 (evolution) Chap 4(supply) Chap 5 (demand)

Assignment: Research assignment 7 due

Current Events: Current event 7 due

- Mar 08** **Read LNG Book:** Chap 6 (LNG pricing)
Assignment: Research assignment 8 due
Current Events: Current event 8 due
- March 15** **SPRING BREAK**
- Mar 22** **Paper Topic Outline due – 1 page outline of proposed paper topic**
- Mar 29** **Read LNG Book:** Chap 7 (safety and sustainability)
Current Events: Current event 9 due
- Apr 05** **Read LNG Book:** Chapter 8 & 9 (LNG projects & players)
Current Events: Current event 10 due
- Apr 12** **Read LNG Book:** Chap 12 (emerging issues)
Current Events: Current event 11 due
- Apr 19** **Paper presentations**
- Apr 26** **Paper presentation – last class**
- April 28** Last day of classes
- May 2-11** Reading days and finals.
- ** There is NO final for this class ****
- MAY 10 (or TBD)** **PAPERS DUE BY 3:00 p.m.**
Turn in via email to Prof. Sakmar susansakmar@globalgaslaw.com

Paper Guidelines (more details will be provided in class)

Length: 15 pages total (Including footnotes but does NOT include title page, abstract, table of contents or Appendix).

Format: 11 or 12 pt font for main text - double-spaced between paragraphs, single-spaced between text. 9 or 10 pt font for footnotes – single-spaced. Page numbers at lower right. **Citations:** Bluebook (or similar style manual)

Footnotes: Footnotes (not endnotes)

The UH Provost’s office has asked the administration of all academic units to require faculty to add the following language to their syllabus relating to counseling and psychological services.

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