Course Overview

This course will chart the development of primary energy sources through the history of the United States and consider the impact of current political and economic decisions around energy on the development of domestic infrastructure and institutions in the near future, as well as the nexus of energy policy and climate change policymaking.

Learning Objectives

After taking this course you should be able to:

- Identify the primary social, economic and technological drivers of the development of the fossil fuel-based economy/culture in the United States;
- Assess the merits and risks of non-fossil fuel-based sources of energy in effectuating an energy transition in America;
- Assess the merits and risks of climate geoengineering options to address climate change and help facilitate a smoother energy transition in America;
- Identify the key factors facilitating and blocking energy transitions and outline key equity and justice considerations
Course Readings

The readings for the course will be derived from the following sources, designated in the class schedule with the icons listed below:

- Electronic readings, which are available on the course Canvas site for this course. Click on the “Files” link and look for the “Readings” folder.
- Online Hyperlinks, which must be accessed via the online version of the Syllabus on the course Canvas site.

Assessment/Assignment Schedule

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<tr>
<th>Assignment</th>
<th>Deadline</th>
<th>% Grade</th>
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<tbody>
<tr>
<td>Special Topics Presentations</td>
<td>Per Assigned Date in Syllabus</td>
<td>15%</td>
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<tr>
<td>Term Paper Summaries: Class Presentations</td>
<td>Per Assigned Date in Syllabus</td>
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<tr>
<td>Term Paper</td>
<td>December 7</td>
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<tr>
<td>Class Participation</td>
<td>Ongoing</td>
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Brief Description of Assignments

Special Topics Presentations

Students will work in groups of 2-3 to prepare 10-minute presentations for class on assigned topics. Please see the “Assignment Guidelines” folder under the Files link for further instruction.

Term Paper Summary Presentations/Term Paper

Each student will prepare a 12-page term paper, conforming to the guidelines set forth in the
“Term Paper Guidelines” document, in the “Term Papers” folder under the Files link on the Canvas site. Each student will also prepare an electronic presentation for class on their preliminary findings. Students and the instructor in the course will provide feedback on the paper, including suggestions.

Class Participation

Class participation assessment will be comprised of your participation during lectures, including participation in statute/cases exercises.

Policies

GRADING:

All grades will ultimately be scaled to a 100-point system: A (94-100); A- (90-93); B+ (87-89); B (83-86); B- (80-82); C+ (77-79); C (73-76); C- (70-72); D (60-69); F (<60).

PLAGIARISM:

Please refer to Northwestern’s resources on academic integrity for guidance on how to properly use and credit research in your work: http://www.northwestern.edu/provost/policies/academic-integrity/.

Suspected violations of academic integrity will be reported to the Dean's Office. For more information on Northwestern’s academic integrity policies, see: http://www.weinberg.northwestern.edu/handbook/integrity/index.html.

ACCOMMODATION:

Any student requesting accommodations related to a disability or other condition is required to register with AccessibleNU (accessiblenu@northwestern.edu; 847-467-5530) and provide professors with an accommodation notification from AccessibleNU, preferably within the first two weeks of class. All information will remain confidential.
## COURSE SCHEDULE

<table>
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<tr>
<th>Date</th>
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| 9.17  | Introduction to the Course | - Instructor introduction  
- Student introductions  
- Review of syllabus |
| **SECTION 1** | Fossil Fuel Energy Use in America |  
| 9.22  | The Rise of Coal and Oil in America, Part 1 | **READINGS:**  
-  E Jones, *Petromyopia: Oil and the Energy Humanities*, 5 *HUMANITIES* 1-10 (2016)  
- **Guest Speaker:** Professor Christopher Jones, Assistant Director of Graduate Studies & Associate Professor, History, Arizona State University, [https://isearch.asu.edu/profile/2174401](https://isearch.asu.edu/profile/2174401) |
| 9.24  | The Rise of Coal and Oil in America, part 2 | **READINGS:**  
- **Student Statute Interpretation Exercise:** The Clean Air Act |
| **SECTION 2** | Energy Innovation: Special Topics |  
| 9.29  | Hydraulic Fracturing (Fracking), Part 1 |  

**READINGS:**

- Raimi, Ch.2, *What is Fracking?*, THE FRACKING DEBATE 11-30 (2018)

**Guest Speaker: Dr. Jane Flegal, Program Officer, Environment, Hewlett Foundation, https://hewlett.org/people/jane-flegal/**

### 10.1 Hydraulic Fracturing (Fracking), Part 2

**READINGS:**

- Raimi, Ch.6, *Is There Any Regulation on Fracking?*, THE FRACKING DEBATE 89-105 (2018)


### 10.6 Nuclear Power, Part 1

**READINGS:**

- Soysal & Soysal, Ch. 4, *Nuclear Energy*, ENERGY FOR SUSTAINABLE SOCIETY 139-81 (2020)

**Student Group Presentation: Thorium Reactors: History and Current Status**

- Brush
- Gooden
- Juracka

### 10.8 Nuclear Power, Part 2

**READINGS:**

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<td>Student Group Presentation: Nuclear Fusion: History and Current Status</td>
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<td>Student Group Presentation: Small Modular Reactors: History and Current Status</td>
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### 10.13 The History and Potential Future of Hydrogen Energy

#### READINGS:

- D’Allegro, *Elon Musk says the tech is ‘mind bogglingly stupid,’ but hydrogen cars may yet threaten Tesla*, CNBC, Feb. 23, 2019

| Student Group Presentation: Europe’s Hydrogen Energy Program: History and Current Status |
| ▪ Gorski |
| ▪ Deradoorian |
| ▪ Taff-Clay |

### SECTION 3 Climate Change, Energy Production, and Innovation: History and Policy Considerations

### 10.15 Overview of the History of Climate Change Regimes and Implications for Energy Innovation, Part 1

#### READINGS:
10.20 Overview of the History of Climate Change Regimes and Implications for Energy Innovation, Part 2

READINGS:

- Wold, Hunter & Powers, Climate Change and the Law, Ch. 4, The UNFCCC (2009), at pp. 149-184
- de Cendra de Larragán, The Kyoto Protocol, with a special focus on flexible mechanisms, Climate Change Law 227-36 (2016)
- Text of the Paris Agreement (2015)

STUDENT LEARNING EXERCISE

Please have access during class to the Paris Agreement Treaty Interpretation Exercise, which can be found in the “Treaty Interpretation Exercises” folder on the course Canvas site, and the text of the Agreement. We will use these materials for our in-class group treaty interpretation exercise.

10.22 Climate Geoengineering, Part 1: Solar Radiation Management

READINGS:

- Irvine, et al., An Overview of the Earth system science of solar geoengineering, 7 WIREs Climate Change 815-33 (2016)
- Lin, Balancing the Risks: Managing Technology and Dangerous Climate Change, 8(3) Issues in Legal Scholarship 1-26 (2009)
- McLaren, Mitigation deterrence and the “moral hazard” of solar radiation management, 4 Earth’s Future 596-602 (2016)

Student Group Presentation: Cirrus Cloud Thinning
### Climate Geoengineering, Part 2: Carbon Dioxide Removal

**Student Group Presentation: “White Roofs”**
- Laszuk
- Lownds

**Readings:**

### Student Group Presentation: “Blue Carbon”
- Lewis
- Mollenkamp
- Murua

### Student Group Presentation: Ocean Upwelling/Downwelling
- Walden
- Wenger
- Kuan

### Carbon Capture and Sequestration: History and Role in Addressing Climate Change

**Readings:**
- Stevens, *Time to stop investing in carbon capture and storage and reduce government subsidies of fossil fuels*, 5(2) WIREs CLIMATE CHANGE 1-5 (2014)
### Student Group Presentation: Ocean-Based Carbon Sequestration
- Lumbantobing
- Mijares-Shafai
- Peterson

### Student Group Presentation: Mineral Carbonation
- O’Brien
- Poindexter
- Steele

## Section 5

### FERC and U.S. Energy Policy

### 11.3 Overview of the History and Role of the Federal Energy Regulatory Commission in U.S. Energy Policy

#### READINGS:

#### Guest Speaker: Professor Sam Kalen, Centennial Distinguished Professor of Law & Co-Director, Center for Law and Energy Resources in the Rockies, University of Wyoming

## Section 4

### The Great Energy Transition: Logistics and Justice

### 11.5 Notions of Justice and Equity in Energy Transitions

#### READINGS:
- Sovacool, et al., *Dispossessed by decarbonisation: Reducing vulnerability, injustice, and inequality in the lived experience of low-carbon pathways*, 137 WORLD DEVELOPMENT 1-12 (2021)
Guest Speaker: Professor Benjamin Sovacool, Professor of Energy Policy, Science Policy Research Unit (SPRU) & Director, the Sussex Energy Group, University of Sussex Business School

11.10 Micro and Macro Perspectives on Energy Transitions

READINGS:

- Graffy & Kihm, Does Disruptive Competition Mean a Death Spiral for Electric Utilities?, 35 ENERGY LAW JOURNAL 1-43 (2014)
- Grubler, Energy transitions research: Insights and cautionary tales, 50 ENERGY POLICY 8-16 (2012)

Guest Speaker: Professor Elisa Graffy, Professor of Practice, School for the Future of Innovation in Society, College of Global Futures, Arizona State University, https://sustainability.asu.edu/person/elisabeth-graffy/

SECTION 5 Term Paper Presentations

11.12 Term Paper Presentations

- Brush
- Gorski
- Sych
- Gooden
- Cadd
- Juracka

11.17 Term Paper Presentations

- Deradoorian
- Hernandez
- Smith
- Taff-Clay
- O’Brien
- Poindexter
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