This is a “living” syllabus; some elements may change, particularly as new governmental policies are enacted, and if we see potential for site visits to power plants or for guest lecturers. If changes occur, we will discuss them in class or post them on the Canvas web site for the course. You are responsible for accepting your Canvas invitation and periodically reviewing the site for updates. You should also sign up to automatically receive all announcements to your VLS email.

Class Times
Tuesday and Thursday
9:55 am – 11:10 am pm
Oakes 110

Contact Information
Professor: Mark James
831-1060
mjames@vermontlaw.edu

Assistant: Will Fridlund
831-1151

Offices: Eaton House, Room 103

Office Hours: By appointment

Textbooks

Course Description & Overview
The energy industry is both:
i) a path to the quality of life that billions seek and
ii) our world’s most significant source of pollution.

Put another way, if you care about energy, environmental problems are the most important constraint now faced by energy industries; and if you care about the environment, the energy sector is the most important influence you must face. This course examines the key issues in American energy policy (with some reference to its global context), and searches for ways to resolve, or at least ease, the strains that such policy puts upon environmental sustainability.
Course Expectations:

Grading

Grading will be based on a 60–100-point score, converted to a letter grade. This score will be based on these elements: mid-term memo (25%); Problems and Solutions assignment (15%); take-home final examination (50%) and a professionalism and class performance grade (10%). Grading will be anonymous only on the final exam.

Grading of Professionalism and Class Performance

We will discuss what professionalism means in the first class. Your class performance grade will evaluate your knowledge of assigned materials and pre-class thought about their significance. In addition, participation that indicates an ability to learn from and encourage input from others will be valued highly. Comments that use an understanding of earlier readings to address later ones are particularly likely to make a favorable impression. Grading class performance is inherently subjective, but my conceptual model is very simple: how happy would an employer be to have had you as part of a taskforce that needed to resolve a hard, uncertain, and important problem?

To help me grade you on class performance, you must bring and display an easily readable tent-card with your full name upon it for each class. If you do not do this, your class-performance credit and your overall grade will suffer.

You should treat class like you would treat a job. First and foremost, treat everyone with respect. Come prepared to participate and if you are not prepared, notify the professor. Everyone receives two opt-out passes that they can use at any time during the course to avoid class participation responsibilities. Please tell me before the class starts if you would like to use a pass. Notify the professor if you must be late to or absent from class. Failure to notify me of an absence will result in a 0.5% deduction on the first occasion and 1.0% on each subsequent occasion.

Reading Questions

Reading questions will be made available for specific classes. The professor will distribute the reading questions through Canvas. It is expected that students will be able answer a reading question when called upon.

Written Projects: 15% of your grade will be based on the semester-long Problems and Solutions assignment, which is broken into five separate assignments. Twenty percent (25%) of your base grade in this course will be based on your take-home mid-term memo. The due date for the memo assignment will be set in the month of September.

A hard copy of your paper must be handed in at the start of the class on that day. A penalty will be assessed for late papers. If an emergency prevents you from meeting the deadline, you must notify me or the Registrar’s office (tmjohnson@vermontlaw.edu) before the due date and time.

Final Examination: The final examination will count for 50% of the base grade. The final exam will be a take-home, multi-day exam with essay topics and short questions. It is likely to require you to consider several of the topics addressed during the course and may require you to focus on tensions and/or
synergies between and among the topics. In other words, if you have not kept up with the readings throughout the course, you will have a very difficult time doing well on the final examination.

**Class Attendance and Participation:** The course requires a great deal of reading upon demanding subjects; however, our class time will not be spent merely on going over each day’s assigned material. Instead, I expect to spend most of our class time in discussions that compare different readings and that go beyond the texts themselves. That expectation is linked to the fact that this course is not just about learning an accepted body of knowledge; rather, it is about searching for better answers in areas where disagreements are persistent, among both experts and lay-folk.

Importantly, contributing to these discussions is not just a way for you to learn the underlying material; it is also a valuable skill that the course seeks to build – and grade.

If you must be absent due to serious illness or a family emergency, please notify the Registrar’s Office (tmjohnson@vermontlaw.edu) which will notify all your professors. Absences resulting from religious observance, serious illness, and personal emergency will be excused if notice is given in advance or as early as possible, to the Professor or the Registrar. Absences for work, interviewing, exercise, or vacationing will not be excused even if prior notice is given. Students who are absent for more than 20% of classes will receive a F grade.

**Covid and the Classroom:** I expect all students to abide by VLGS policies and to adjust to any changes to VLGS policies. If we need to shift back to an online learning format, we will be using Microsoft Teams. If you have any questions about VLGS’ Covid precautions, please contact me or VLGS’ Covid coordinator.

**Recording Lectures**
Lectures may be recorded, as necessitated, using Microsoft Team and a link will be made available to the recorded lecture. Lectures will not be livestreamed. You may record the lecture on your own. My only request is to be informed that the lecture is being recorded.

**Accommodations for Disabilities**
If you have a disability and would like to request an accommodation, please review our Disability Policy at Vermont Law School academic accommodations at:
https://www.vermontlaw.edu/community/students/academic-success/accommodations.

On that webpage, there is also an on-line form you can complete and upload your supporting documentations. If you have questions, please make an appointment with the Vice Dean for Students. Please note that requests made within two weeks of a midterm, or a final examination may not be granted in time. Please make your request as soon as possible.

**Plagiarism Policy**
Students are cautioned to comply with the requirements of the Honor Code by avoiding plagiarism and other misconduct as provided in the student handbook. When in doubt about plagiarism, paraphrasing, quoting, or collaboration, consult the instructor. You all know not to plagiarize, but some of you may conceivably be confused as to what plagiarism means in this context. Of course, you all know that you
cannot quote another author without attribution. This includes websites! Merely altering a few words does not permit you to omit quotation marks. In addition, it is also improper to paraphrase or borrow ideas from another, without attribution. If you got an idea from another author, cite that work. It is often appropriate to explain either in text or footnotes how your own argument differs from that previously made by others. You will find other articles’ sources/footnotes to be a rich source of information. However, to the extent that you rely on another article’s footnotes you must read all such sources yourself to make sure they really say what the other author said they said. It is never proper to cite a source you have not yourself read, unless you note that you are “citing Source A citing Source B.” This should only be done rarely, when that second source is important but cannot be located. To the extent you use other authors’ footnotes as starting points you will often find you need to update such footnotes, e.g., by citing to a more current statute or version of the book. If you have any questions regarding when cites are and are not needed, please ask me, or err on the side of citation. Plagiarism is an Honor Code violation that will result in an F in the course and a referral to the Vice Dean for Students for further action.

**Energy Policy Learning Outcomes**

By the end of this course, you should understand and be able to apply the following concepts:

1. The relationship between energy production and consumption and the environment.
2. The drivers between major changes in American energy policy.
3. Policies and laws affecting major sources of conventional and renewable energy.
4. The historical roots of utility regulation and how they affect current regulatory regimes.
5. The boundary between federal and state jurisdiction in energy regulation.
6. The obligations and duties of a public utility commission.
7. The changing relationship between electricity, transportation, and thermal uses of energy.
8. The role of beneficial electrification in the transition to a low-carbon economy.
9. Options for and obstacles to developing a pathway to a low-carbon energy system and the future course of a national energy policy.
Class Schedule and Learning Materials

Class 1 – Introduction to Energy Policy in a Carbon Constrained World – The Challenge

In our first class, we will discuss the big questions and themes of the course. Like, why are we here? What do we want to accomplish over the next 28 classes? What do you want to takeaway from Energy Policy in a Carbon Constrained World? We will spend the first part of the class going over the syllabus, the course goals, getting to know each other, and discussing student and professor expectations. The second half of the class will focus on how we will evaluate energy problems and create energy solutions.

Learning Materials

Class 1 – The Challenge

1. Carbon Brief, *In-depth Q&A: The IPCC’s sixth assessment on how to tackle climate change*, April 5, 2022, https://www.carbonbrief.org/in-depth-qa-the-ipccs-sixth-assessment-on-how-to-tackle-climate-change/. Read the following sections (why can be accessed via hyperlinks at top of reading) and be ready to answer reading questions posted in Canvas.
   a. What is the Working Group III report?
   b. How have global emissions been changing?
   c. How do current policies and pledges compare to scenarios assessed by the IPCC?
   d. What would it take to limit warming to 1.5 or 2°C?
   e. How can shifting peoples’ demand for products and services cut emissions?
   f. How must global energy systems change to limit warming?
   g. What needs to happen to the transport sector to cut CO₂?
   h. How can industry be decarbonized?
   i. What climate policies are being implemented and are they working?
   j. How much innovation and new technology is needed to hit climate goals?


   a. TS-2 to TS-13 (TS. 2 The changed global context, signs of progress and continuing 1 challenges and TS. 3 Emission trends and drivers)
   b. TS-52 to TS-60 (TS. 5 Mitigation responses in sectors and systems and TS. 5.1 Energy)

Class 2 – The Energy Transition

In this class, we will look at the overall structure of the course and our guiding theme, how to transition to a low-carbon economy equitably and quickly.

Learning Materials

2. Project Drawdown, *The Drawdown Review: Climate Solutions for a New Decade* (March 2020). (Read pages 4-7 and 16-25) As you read, think critically about the size and scope of the challenge and the timelines for making the necessary changes.


5. [Suggested] Evergreen Action, *Everything You Need to Know About Implementing the IRA’s Most Important Programs*, June 26, 2023, https://www.evergreenaction.com/blog/implementing-the-inflation-reduction-acts-most-important-programs. Read to learn about how passage of the IRA is only the first step to realizing the potential change contained in the law.


**Class 3 - Energy Basics**

In this class, we will get familiar with different energy terms. Energy law and policy has a unique jargon that combines legal terms, engineering concepts, and economics. To fully engage in the energy field, you will need to build your base knowledge and this class will provide a start to that process.

**Learning Materials**


**Class 4 - Electrify Everything**

This class discusses the opportunities and challenges in reducing fossil fuel usage through electrification. The one source of energy that we know how to generate with little to no GHG emissions is electricity. Switching from fossil fuels to electricity is the best option for transitioning to a net-zero system. However, electrification will require a two- to four-fold increase in the amount of electricity that we currently generate and that brings challenges in making sure that our systems continue to function as they were designed.
Learning Materials


Class 5 - At What Price? Costing Out the Energy Transition

Every energy decision comes with a price tag. In this class, we will unpack some of the most common metrics for evaluating energy projects and explore their strengths and weaknesses.

Learning Materials


**Class 6 - Energy Justice**

In this class, we will explore the growing interest in incorporating environmental and energy justice into the energy transition. We will look at the broad definitions of environmental and energy justice and how those definitions can be turned into actions.

**Learning Materials**


   a. Suggested – Watch 201:00 to 2:11:00. This section reviews and discusses CPUC procedures and how they can incorporate ESJ principles. Time permitting, we will be using this video in an issue spotting exercise.


6. [Supplemental] California Public Utilities Commission, *Environmental and Social Justice Action Plan V2*, [https://www.cpuc.ca.gov/ESJactionplan/](https://www.cpuc.ca.gov/ESJactionplan/). This webpage provides an overview of the ESJ Plan and access to webinars where feedback was provided on draft versions of the updates.

**Class 7 – How to Pass an Energy Law in Vermont – Guest Lecture, State Senator Becca White**

Senator White will discuss her work to pass Vermont’s Affordable Heating Act in the last legislative session.

**Note:** This lecture will occur on September 12th regardless of where we are in the syllabus.

**Learning Materials**

1. Vermont Affordable Heat Act (2023)


Class 8 - Constitutional Law - Federal-State Relationship
This class will explore key constitutional provisions that define how energy is regulated in the United States.

Learning Materials

Class 9 - Regulation of Environmental Impacts of Energy Consumption
In this class, we investigate the environmental and health impacts of fossil fuel usage and how those impacts are regulated.

Learning Materials
2. [https://static1.squarespace.com/static/5a1f1ec0017db2ba229768a1/t/5d1be0abf8ff4d0001f1b989/1562108076253/Freeman_final.pdf](https://static1.squarespace.com/static/5a1f1ec0017db2ba229768a1/t/5d1be0abf8ff4d0001f1b989/1562108076253/Freeman_final.pdf).
6. MIT News, Study: Shutting down nuclear power could increase air pollution, April 10, 2023 [https://news.mit.edu/2023/study-shutting-down-nuclear-power-could-increase-air-pollution-0410](https://news.mit.edu/2023/study-shutting-down-nuclear-power-could-increase-air-pollution-0410). (This is an example of an article that could be used in your mid-term memo assignment)

Class 10 - Natural Gas
Natural gas has displaced coal as the largest fossil fuel resources in electricity generation. The lower emissions of natural gas plants reduced electricity sector’s GHG emissions and the low prices of fracked natural gas reduced customer bills. In this class, we will explore the regulatory regime for natural gas, the role of fracking in unlocking vast reserves of natural gas, and if natural gas is a bridge fuel to a clean energy system.
Learning Materials


**Class 11 - The Rise or Fall of Nuclear**

Nuclear power is a controversial topic. Is it a clean energy resource that is needed for the energy transition or is it an expensive relic that should be moved out to make space for newer and cheaper resources? Do the risks of nuclear power outweigh the benefits of its low carbon electricity? In this class, we will explore the role of existing nuclear in the energy transition.

Learning Materials


**Class 12 - Hydro**

Hydropower is the first renewable resource. A power source that has been tapped to produce electricity since the 1800s. In this class, we examine the rise of hydropower and how it shaped our modern electricity regulatory system and what the future holds for this technology.

**Learning Materials**


14. [Supplemental] American Rivers et al, Summary of Federal Power Act Amendments Package, April 2022. This resource addresses efforts to increase consultation with affected parties including states and Indian tribes.
15. [Supplemental] FERC, Pumped Storage Projects, https://www.ferc.gov/licensing/pumped-storage-projects. This is a regularly updated list of the status of different applications for licenses to construct pumped storage projects.

Classes 13 and 14 - Wind and Solar
The path to a clean energy system will be built upon our most plentiful renewable resources, wind and solar. There was a time when wind and solar were more expensive than conventional fossil fuel resources. Technology and manufacturing improvements combined with government incentives have dramatically cut the costs of installing wind and solar generation. As wind and solar generation increases, so do concerns about how to balance the intermittent nature of their generation with the need to maintain grid stability. Over two class, we will explore some of the incentive mechanisms supporting renewable energy; the challenges and benefits of integrating variable energy resources onto the grid; and the next big renewable resource – offshore wind.
Learning Materials
Renewable Energy


Offshore Wind


Distributed Solar


Class 15 - Geothermal and Biomass

Renewable energy skeptics often point to the variable nature of wind and solar as the reason why a clean energy system is either unfeasible or too expensive. Some renewable energy proponents point to geothermal and biomass as two resources that can provide on-demand renewable electricity that will balance out the intermittency of wind and solar. In this class, we will investigate the potential of geothermal and biomass in the energy transition and the pitfalls of each resource.

Learning Materials


   a. Read Executive Summary
   b. Skim Sections 1.1 and 1.2
   c. Read Section 1.3
   d. Skim Section 2.1
   e. Read Section 2.2.1
   f. Read Section 2.3 (all parts of Section 2.3)
   g. Read Section 2.4, 2.4.1, and 2.4.3.1.


### Classes 16-18 - Public Utility Commission – History, Ratemaking, and Planning

State public utility commissions will be key players in determining the pace and scale of the energy transition. In this series of lectures, we will explore the historic origins of the utility commission, how regulatory principles espoused in the 18th century still affect public utility regulation today, the ratemaking authority of utility commissions, and how utility commissions can plan for a low-carbon grid.

#### Class 16 - History of Public Utility Regulation

In this class, we investigate why utility commissions were created and what it means to regulate in the “public interest.”

**Learning Materials**


#### Class 17 - Ratemaking

In this class, we explore the ratemaking authority of public utility commissions and how commissions determine the rates that appear on your utility bills.
Learning Materials

**Class 18 - Utility Commission and System Planning**
To change our energy systems, we must change how we plan our energy systems. Energy system planning has always been driven by the lowest cost option. However, for many decades, not all costs were weighed in determining what was the lowest cost option. In this class, we look at how utilities and utility commissions are adapting planning criteria to value climate change.

Guest Lecture – TJ Poor, Director, Regulated Utility Planning Division, Vermont Public Service Department. This lecture will occur on November 7, 2023.

Learning Materials
1. Vermont Comprehensive Energy Plan (2022)
   a. Read Chapters 1, 2, and 3.

**Mid-term**
Take-home memo assignment. To be scheduled.

**Class 19 - Hydrogen**
In this class, we will explore and investigate the use of hydrogen in the clean energy transition in accessing difficult to decarbonize sectors and providing long-term energy storage. We will examine the different uses of hydrogen, the concerns about the climate impacts of different production methods, and the obstacles and opportunities of hydrogen.

Learning Materials


**Class 20 - Battery Storage**

Electricity must be generated when it is needed. This law of physics has guided the development and operation of our electricity grid since its inception. Efforts to store energy have been underway. In this class, we will explore the history of energy storage and the potential for energy storage to reshape how our electricity systems work.

Guest Lecturer – Kevin Jones, Director of the Institute for Energy and the Environment
Learning Materials


Class 21 - Transmission
A bigger, stronger electrical grid is a necessity if we are to tap into the tremendous potential for renewable energy. Moving energy from where it is generated to where it is consumed will facilitate the energy transmission. Much of that transmission will be planned and constructed in RTOs. In this class, we investigate the proposals for building out transmission and why building transmission has proven to be a hurdle to developing renewable energy resources.

Learning Materials


Class 22 - Energy Efficiency, Low-Income Programs, and GHG Reductions
This class investigates the role of energy efficiency in a clean energy transition and its untapped potential to reduce electricity bills and GHG emissions and to serve energy-burdened low income communities.

Learning Materials

Class 23 – Transportation Electrification

Transportation is going electric. In this class, we explore how the efforts to electrify transportation must address equity considerations.

Learning Materials
2. Carolyn Gramling, Science News, There’s good and bad news with California’s electric vehicle program, May 12, 2023, https://www.sciencenews.org/article/california-electric-vehicle-program.
4. Peter Huether, ACEEE, Electric Vehicle Supply Equipment (EVSE) with Equity in Mind, April 2021, https://www.aceee.org/sites/default/files/pdfs/siting_evse_with_equity_final_3-30-21.pdf. Read pages 1-22, skim case studies. (Try to understand how a comprehensive planning program is constructed and what are its constituent elements)
5. [Supplemental] Citizens Utility Board, EV for All: Electrifying Transportation in Low-Income Communities (2021)
6. Discussion Focus – How do we plan to get out ahead of a problem? Chicken and egg situation – Building chargers before they are needed or waiting for need and potentially suppressing demand. Is the goal to electrify transportation or to integrate equity into transportation electrification?

Class 24 - Stranded Energy Assets

For much of this course, we have talked about adding new resources to the grid. That is an essential part of the energy transition. We have also learned about the long-lived nature of energy infrastructure. The deconstruction of historical systems is also an essential part of the energy transition and the focus of
this class. We must eliminate fossil fuel infrastructure faster than its planned retirement dates and that raises issues of cost, equity, and reliability planning.

Learning Materials


### Class 27 - The Big Finish

In this class, we wrap up the course and discuss the obstacles and opportunities embedded in the energy transition.

Learning Materials


