SYLLABUS — Fall 2015

ENVS 5820 / ENST 5001

Renewable & Sustainable Energy Policy / Energy Policy in the 21st Century

Class Time and Location: Mondays, 2:15-4:45pm, ECCS 1B14

Instructor: Adam Reed, J.D., **adam.reed@colorado.edu**, 303-735-4352

Office Hours: 1-2PM, Tuesdays and Thursdays, SEEC S113 (in the ENVS Programs Office on East Campus, Colorado Ave. at Foothills Pkwy.). I'm also available by appointment.

D2L Access: All materials for this course are available online, and can be accessed via http://learn.colorado.edu. Assignments may be submitted through D2L. In the event of a technical problem with the D2L system, please submit assignments via email to adam.reed@colorado.edu.

Sections: Please ensure that you are enrolled in the appropriate section.

On-Campus, Degree-Seeking Students: ENVS 5820 001
Distance, Degree-Seeking Students: ENST 5001 001B
Distance, Non-Degree-Seeking Students: ENST 5001 740

Synchronous / Asynchronous Attendance: Distance students may attend class *synchronously* (in real-time) or *asynchronously* (by watching a recording of the class).

- Asynchronous recordings are available on D2L, but ONLY if you are a distance student enrolled in ENST 5001. On-campus students enrolled in ENVS 5820 will not have access to recordings.
- Synchronous attendance occurs through Zoom, a cloud-videoconferencing program. Zoom uses your computer's camera and microphone to display you on one of several monitors in our classroom, so that you can both watch and interact with the class in real-time. You'll be able to ask questions, respond to other students, and essentially do anything you could do sitting right here, short of pinching your neighbors. Be aware that you will be visible and audible to other students and may be recorded, so the same etiquette that applies in class applies to Zoom: please no barking dogs, screaming kids, or movies playing in the background. Please also remain in front of your computer while attending. If you can't find a quiet place without distractions, please attend class asynchronously as a courtesy for other students.

How to use Zoom:

Setup and Download Zoom:
http://www.colorado.edu/oit/tutorial/zoom-download-and-setup

How to Join a Zoom Meeting:
http://www.colorado.edu/oit/tutorial/zoom-join-meeting

Zoom Meeting info for this class:
- Join via Web Browser: https://zoom.us/j/363689767
- Join via Zoom app (Meeting ID): 363689767
- Join via phone: 1-646-558-8656 or 1-408-638-0968

Honor Code: For international students especially, please familiarize yourself with the following standards of academic integrity, as they may differ from your home country's customs and have, on occasion, led to unwitting violations: http://honorcode.colorado.edu/faculty-information/faculty-cus-standards-academic-integrity

Special Services: Students with disabilities, please let me know early in the semester (that is, by Sep. 1) so that your academic needs may be appropriately met. Students with religious obligations that conflict with the class should contact me early in the semester so that accommodations can be made. More information is available in the Syllabus Supplement.

Topics of the Course

Sustainable energy has two commonly-cited components: renewable energy and energy efficiency. In recent years, questions surrounding sustainability in the energy system have also highlighted the role of conventional technologies (coal, gas, nuclear) in a rapidly transforming energy sector. In this class, we explore policies that promote or influence renewables and efficiency, as well as address broader questions of system transformation toward sustainability.

Renewables, and the energy system generally, are in the midst of remarkable transition. Wind power now supplies more than 15% of electricity in some U.S. states, new renewables businesses are growing, and many regions – including Colorado – now mandate that renewables play a significant role in future electricity supplies. Globally, solar energy has seen an over 6500% (yes, that's *six thousand, five hundred percent*) increase in capacity in just ten years. Energy efficiency is on a different path – one of slow but steady progress. Many argue that efficiency is the least-cost and most environmentally friendly option for meeting future energy needs, yet efficiency has received scant policy attention — in fact, the EPA axed efficiency as an official goal in its newly-released Clean Power Plan due to concerns that it made the Plan vulnerable to legal attacks. Meanwhile, a domestic boom in oil and natural gas in the United States since 2006 has flooded primary energy markets with cheap and readily available fossil fuels, which threaten to derail growing renewables markets, but may also play a crucial role in fostering more flexible energy grids capable of carrying more wind and solar power.

What role could, and should, renewables and efficiency play in our national electricity supply? What policy options are available to increase our use of renewables and efficiency? How do these policy options work, and how do they interface with policies that affect competing technologies? What do we know of their unintended side effects? How do we measure the success of an energy policy? These and other related questions will be explored in this class. We will use a mix of lectures, guest speakers, discussions, mock debates, and student presentations to tease apart the complex process through which policy influences renewables and

efficiency, and how, increasingly, sustainable energy policy is becoming inextricably intertwined with national and global energy policy generally.

Pedagogical Approach and Reading Materials

Since the Postwar Era, Energy Policy has largely been the realm of technocrats and engineers, whose knowledge of the complex workings of the energy system made them the unparalleled experts on how to build, maintain, and ensure reliable power for the nation's needs. Consequently, most conventional wisdom regarding energy policy takes (often unconsciously) a *techno-economic* approach. This means that the energy-economic system is often conceptualized as a deterministic machine, with various inputs and outputs, outcomes that are (to some extent) predictable, and values that are bounded primarily by questions of cost. And it is from this techno-economic perspective that many renewable energy policies have been designed and implemented.

It is our goal in this class to understand and become conversant in the language and conventions of this perspective, but also to *deconstruct* the techno-economic perspective so that we might see everything that it leaves out. This is because energy policy is fundamentally changing, and the energy system's concerns are expanding beyond simple reliability and cost to include a host of other concerns — not least among them the preservation of the biosphere and continued habitability of the planet for human and other forms of life. New perspectives are flooding into the energy policy space, and world-views are colliding in nearly every corner of the energy sector. Technocrats and engineers now sit side-by-side at the energy policy table with lawyers, ecologists, atmospheric scientists, sociologists, economists, politicians, entrepreneurs, huge multinational corporations, poor people, wealthy people, activists and NGOs, as well as entrenched interests — basically everyone on the planet, because energy policy *literally* affects every living thing on Earth.

The range of disciplinary approaches, positions, alliances and foes in this space is so vast and complex as to defy anyone a full grasp. Nonetheless, we can dramatically improve our ability to critically assess analyses, arguments, and conclusions in energy policy by directing our attention toward work that has sought, in various ways, to reframe energy systems and energy policy in innovative and alternative ways. For this purpose, we will examine four books over the course of the semester that all, in their own way, manage to escape from energy policy groupthink and present unique ways of seeing the problem afresh, providing ample opportunities for our discussions. They are all available (and largely affordable) through the CU Bookstore and on amazon.com:

David Nye, Consuming Power: A Social History of American Energies (1999): This tremendously enjoyable book by MIT social historian David Nye chronicles energy development and use in North America since the arrival of Europeans in the 17th Century. Nye shows in vivid and entertaining detail how energy is intermingled with the human experience of modernity, and how the human and technological worlds are in constant co-creation.

Richard Vietor, Energy Policy in America Since 1945: A Study of Business-Government Relations (1987): The definitive case-history of large-scale direction of the energy industry by

business/government commingling since the end of WWII. This book is critical for understanding the current decision-making landscape that we confront when we try to make changes to the energy system's operation or composition.

Vaclav Smil, Energy at the Crossroads: Global Perspectives and Uncertainties (2005): Smil is a rare bird — deeply trained and competent in techno-economic energy discourse, and yet a formidable skeptic of energy-economic forecasting as a tool for energy policy. This book examines the challenge of rapid transformation of the energy sector given overarching ecological limits, and strains such a transformation will put on both technical and economic systems. His writing is a bit dry. All the numbers begin to swim in your head after a while. But he will teach you two valuable skills: (1) how to think like a technocrat, and (2) how to see through technocratic arguments to their underlying assumptions and limitations.

Antoine Halff, Benjamin Sovacool, and Jon Rozhon, Energy Poverty: Global Challenges and Local Solutions (2014): Our final book explores the only-recently-recognized problem of global energy poverty. Indeed, while energy and environmental policy have been linked since the 1970s, it is only in the last decade that we have come to realize the extent to which we cannot solve global energy and environmental problems without also addressing global poverty. This is, unfortunately, extremely difficult to do. We'll grapple with it here.

Classes will generally be divided between lecture (covering particular energy policy topics, often timely or recent in origin) and discussion (an open forum where we discuss the readings and more long-term energy policy issues, sometimes with expert guests). I aim for the lectures and discussions to be complementary rather than repetitive, so please attend both as much as possible. In the lectures, we will be examining the canon of energy policy and sustainability, as commonly conceptualized and explained. In the discussions, we'll be interrogating that canon and exploring a variety of alternative perspectives.

Projects and Grading

Grading in this class has four components:

Reading Response Papers — 10% (20% for distance students)
Discussion Participation — 10% (0% for distance students)
Homework Assignments — 45%
Semester-long Project — 35%
THERE ARE NO EXAMS! :)

Reading Response Papers are designed to help prepare us to have an engaging discussion. Please do them — they're critical for us to have meaningful discussions in class, and they're the easiest points to get. The requirements are simple: **prior to class, write approx. 1 page (single-spaced, 12 point times new roman, 1 inch margins) responding to something interesting, informative, infuriating, or whatever, about the reading assignment**. This isn't rocket science. Just use your own words to tell me something about the reading in an informal and comfortable note. There are no grammar rules or points off for spelling. And even if you don't have anything all that insightful to say, you'll still get close to full credit. **If you demonstrate**

some independent thought that goes beyond just parroting what the author said, you get full credit. This counts for 10% of your grade for in-class students, and 20% of your grade for distance students. **Response Papers are Due to D2L on Mondays by 9AM MST, so I can read them and prepare our discussion. Late papers will receive zero credit.**

Discussion Participation is another category of easy points. From time to time, raise your hand and contribute to the conversation. It doesn't need to happen every class. When you aren't speaking, pay attention to people who are. This will be made easier by the fact that **all laptop screens must close during discussion** — so you won't be tempted by distractions. If you can't think of anything to say, try playing "Devil's Advocate" and argue for a position with which you disagree — this is a great exercise in seeing things from other points of view. Distance students normally do not have a participation grade, but if you are able to attend the class synchronously and wish to have participation points, please let me know.

Homework Assignments are the largest proportion of the grade. They might include mathematical calculations, formal writing assignments, or presentations. You will receive more guidance on these as they arise. Homework assignments may challenge you as they often involve using skills that may have grown a little bit rusty over the years – don't put them off until the night before they are due. But rest assured, you can complete all of them with careful, engaged thinking and a little bit of high-school-level algebra or basic grammar and style. If you need a refresher on any of these, come talk to me and I can point you to some helpful resources.

The Semester-Long Project gives you **two options**:

1. A group policy research project with a real-life client (highly recommended — I'll help you find the client, and it's a great way to build your professional network!);
2. A substantial research paper discussing an energy policy topic.

We'll talk more about these in a separate document.

Schedule

The *tentative* class schedule is below, and is meant to provide you with a general idea of what we'll be doing and when. Note that this may change due to guest speaker availability, new legislation, and other factors. I do not plan this course out in great detail beyond the following week or two, for two reasons:

1. Energy policy is in nearly constant flux, and we need the flexibility to shift gears if something really exciting happens in current events.

2. I am *constantly* evolving this course, and I value your feedback throughout the semester. If there's a topic you'd like covered and it's not here, let me know! If you think the book we're reading stinks and you aren't learning anything from it, bring it up. We're all in this together, and I rely on you to help me keep this course interesting and relevant.

Note that specific reading assignments are not detailed on this document. I will email those reading assignments to the class on Mondays, generally, and they should be completed before class on the following week. This is because some of the books on our reading list are new to me as well, and I will be keeping up a few weeks ahead of you all so that I can cut out chapters that aren't necessary for us.

Date	Lecture Topic	Discussion (Reading Assignment)	Homework/project deadlines
August 24th	Introductions, Syllabus Overview, Expectations, Q&A	Projects/Papers Discussion	
August 31st	Energy, Environment, and Sustainability — Past, Present, Future	Nye, Consuming Power	Homework 1 assigned
September 7th	NO CLASS — Labor Day	NO CLASS — Labor Day	
September 14th	Energy Utilities and Regulation	Nye, Consuming Power	Homework 1 due
September 21st	Wholesale Energy Markets and Integration of Renewable Energy	Vietor, Energy Policy Since 1945	Project Proposal Drafts Due Homework 2 assigned
September 28th	Grid Access for Renewables — PURPA, Net Metering	Vietor, Energy Policy Since 1945	
October 5th	A History of Public Power / Emerging Rights to Local Generation	Vietor, Energy Policy Since 1945	Homework 2 due Final Project Proposals Due Homework 3 assigned
October 12th	Tax Credits and Other Financial Levers	Smil, Energy at the Crossroads	
October 19th	Renewable Portfolio Standards and Feed-in Tariffs	Smil, Energy at the Crossroads	Homework 3 due Homework 4 Assigned
October 26th	The Clean Power Plan	Smil, Energy at the Crossroads	
November 2nd	International Energy Policy	Energy Poverty	Homework 4 due
November 9th	Class, Gender, and Race in Energy	Energy Poverty	Project Update Reports Due
November 16th	Global Capital and Systemic Risk in Energy System Transformation	Energy Poverty	

November 23rd	NO CLASS — Fall Break	NO CLASS — Fall Break	
November 30th	Final Presentations	Final Presentations	Final Project Presentations (1)
December 7th	Final Presentations	Final Presentations	Final Project Presentations (2) Final Project Deliverables Due