

PubPol 495: Energy and Climate

Tuesdays and Thursdays 1:00 – 2:30 p.m., 1230 Weill Hall

Fall 2018 – Ford School of Public Policy – University of Michigan

Prof. Catie Hausman – chausman@umich.edu – (734) 615-6951

Office hours: T 2:30 – 3:30, Th 3:30 – 4:30 p.m., 4215 Weill Hall

OVERVIEW

The climate is changing at an unprecedented rate, with implications for human well-being around the world. This course will explore how economic activity contributes to climate change, how climate change impacts the economy, the environment, and people's well-being. We will analyze how different energy sectors (including coal, oil, and natural gas) contribute to climate change. We will discuss and analyze the incentives faced and decision-making by consumers and firms. We'll delve into theories of when and how government can or should regulate these sectors.

Our goals are to:

- **Think critically about policy issues and options related to climate change.**
- **To understand the basics of some of the energy markets that contribute to climate change.**
- **To develop excellence in conveying our ideas in written form.**

How to contact me

I encourage you to come to office hours. They give us a chance to discuss things in more depth than is possible via email. I am also available by appointment outside of scheduled office hours.

Readings and course website

We will be using *The Climate Casino*, by Nordhaus. This will be supplemented with readings (on Canvas) from journals, blogs, etc.

Course-related information, class handouts, and readings will all be available on the course Canvas site. Please let me know if you have any difficulties accessing the site.

Attendance and participation

Lectures, class discussions, and readings are complements, not substitutes. I will assume that you have read the material before class. Also, I will cover things in lecture that are not in the readings. Every day there will be a one or two question quiz on the readings, which will be easy if you did the reading, and difficult otherwise. These will be part of your participation grade. I encourage you to raise questions and comments during lectures!

Grading

Grading will be as follows:

- Class participation (including reading quizzes): 15%
- Reading reflections: 30%
- Essay (see breakdown below): 55%
 - Topic description and annotated bibliography: 5%
 - Preliminary full draft: 15%
 - Peer review: 5%
 - Oral presentation: 10%
 - Final paper: 20%

Academic expectations

I take academic dishonesty and plagiarism very seriously, and violations will result in disciplinary action.

Resources on writing are available (e.g., <http://www.lib.umich.edu/academic-integrity/understanding-academic-integrity-and-plagiarism-students> and http://www.lib.umich.edu/sites/default/files/services/instruction/types_of_plagiarism_accessible.pdf).

Inclusivity

Members of the Ford School community represent a rich variety of backgrounds and perspectives. We are committed to providing an atmosphere for learning that respects diversity. While working together to build this community we ask all members to:

- share their unique experiences, values and beliefs
- be open to the views of others
- honor the uniqueness of their colleagues
- appreciate the opportunity that we have to learn from each other in this community
- value one another's opinions and communicate in a respectful manner
- keep confidential discussions that the community has of a personal (or professional) nature
- use this opportunity together to discuss ways in which we can create an inclusive environment in Ford classes and across the UM community

Accommodations for students with disabilities

If you need an accommodation for a disability, please let me know as soon as possible. Some aspects of this course may be modified to facilitate your participation and progress. As soon as you make me aware of your needs, we can work with the Office of Services for Students with Disabilities to help us determine appropriate accommodations. I will treat any information you provide as private and confidential.

Student mental health and wellbeing

The University of Michigan is committed to advancing the mental health and wellbeing of its students. We acknowledge that a variety of issues, such as strained relationships, increased anxiety, alcohol/drug problems, and depression, directly impacts students' academic performance.

If you or someone you know is feeling overwhelmed, depressed, and/or in need of support, services are available. For help, contact Counseling and Psychological Services (CAPS) at 734-764-8312 and <https://caps.umich.edu/> and/or University Health Service (UHS). For a listing of other mental health resources available on and off campus, visit: <http://umich.edu/~mhealth/>.

Use of technology in the classroom

There is very good [evidence](#) that laptops and tablets make it harder to learn. As a result, I do not allow laptops or other screens in the classroom.

I do not allow audio or video recording in the classroom.

Notes from the course (both the ones that I provide and the ones that you take) may not be posted on a web site, made available for file sharing, or distributed in any medium (print or electronic). The only exception is to provide a copy to a student in the class who has been absent from class.

Please review additional information and policies regarding academic expectations and resources at the Ford School of Public Policy at this link:

<http://fordschool.umich.edu/academics/expectations>

COURSE OUTLINE

| Date | Topic | Assignments |
|-------------|--|----------------------------|
| T Sep 4 | Introduction | |
| Th Sep 6 | Setting the stage | |
| T Sep 11 | Economics and climate change | |
| Th Sep 13 | Temperature: past, present and future | |
| T Sep 18 | Tipping points | |
| Th Sep 20 | Impacts analysis + farming | |
| T Sep 25 | Health impacts | |
| Th Sep 27 | Sea level rise | |
| T Oct 2 | Hurricanes + species loss | Annotated bibliography due |
| Th Oct 4 | Putting the pieces together on impacts | |
| T Oct 9 | Policy strategies: adaptation, geo-engineering, and mitigation | |
| Th Oct 11 | Calculating policy costs | |
| T Oct 16 | NO CLASS – Fall study break | |
| Th Oct 18 | Ethical questions across generations | |
| T Oct 23 | In-class peer review | First draft of paper due |
| Th Oct 25 | How much action to take? | |
| T Oct 30 | Carbon pricing | |
| Th Nov 1 | International negotiations | |
| T Nov 6 | In a second-best world | |
| Th Nov 8 | Technological solutions | |
| T Nov 13 | Electricity markets and climate change | |
| Th Nov 15 | Electricity markets and climate change | |
| T Nov 20 | Transportation markets and climate change | |
| Th Nov 22 | NO CLASS – Thanksgiving | |
| T Nov 27 | Fracking and the climate | |
| Th Nov 29 | Methane and the climate | |
| T Dec 4 | Presentations | |
| Th Dec 6 | Presentations | |
| T Dec 11 | Presentations | Paper due |

READINGS

Th Sep 6: Setting the stage

Nordhaus, Chapters 1 and 2.

Plumer, Brad. "The EPA Outlines Our Choices on Global Warming: Moderate Disaster or Major Disaster." *Vox.com* 23 June 2015.

T Sep 11: Economics and climate change

Nordhaus, Chapter 3

Greenstone, Michael. "If We Dig Out All Our Fossil Fuels, Here's How Hot We Can Expect It to Get." *New York Times* 9 April 2015.

Th Sep 13: Temperature: past, present and future

Nordhaus, Chapter 4

Van Vuuren et al. 2011. "The representative concentration pathways: an overview." *Climatic Change* 109: 5-31. [I will tell you which sections to focus on.]

T Sep 18: Tipping points

Nordhaus, Chapter 5

Kopp et al. 2016. "Tipping elements and climate – economic shocks: Pathways toward integrated assessment." *Earth's Future* 4: 346-372. [I will tell you which sections to focus on.]

Th Sep 20: Impacts analysis + farming

Nordhaus, Chapters 6 and 7

T Sep 25: Health impacts

Nordhaus, Chapter 8

Burke et al. "Weather and Violence." *New York Times* 30 August 2013.

Goodman et al. "Heat isn't just a nuisance to students; it's a barrier to learning." *TheHill.com* 14 June 2018.

(Optional) Hanna, Rema and Paulina Oliva. "Implications of Climate Change for Children in Developing Countries." *The Future of Children* 26(1): 115-132.

Th Sep 27: Sea level rise

Nordhaus, Chapter 9

T Oct 2: Hurricanes + species loss

Nordhaus, Chapters 10 and 11

Th Oct 4: Putting the pieces together on impacts

Nordhaus, Chapter 12

Hsiang et al. 2017. "Estimating economic damage from climate change in the United States." *Science* 356(6345): 1362-1369.

T Oct 9: Policy strategies: adaptation, geo-engineering, and mitigation

Nordhaus, Chapters 13 and 14

Th Oct 11: Calculating policy costs

Nordhaus, Chapter 15

McKinsey and Company. 2009. "Pathways to a Low-Carbon Economy: Version 2 of the Global Greenhouse Gas Abatement Cost Curve." [I will tell you which sections to focus on.]

Th Oct 18: Ethical questions across generations

Nordhaus, Chapter 16

Roberts, David. "Discount rates: A boring thing you should know about (with otters!)." 4 Sep 2012. *Grist.org*.

Th Oct 25: How much action to take?

Nordhaus, Chapters 17 and 18

T Oct 30: Carbon pricing

Nordhaus, Chapters 19 and 20

Tyson, Laura D'Andrea. "The Myriad Benefits of a Carbon Tax." *New York Times* 28 June 2013.

Th Nov 1: International negotiations

Nordhaus, Chapter 21

T Nov 6: In a second-best world

Nordhaus, Chapter 22

Fowlie, Meredith. "Carbon Markets, Waterbeds, and You." *EnergyatHaas.wordpress.com* 15 April 2018.

Th Nov 8: Technological solutions

Nordhaus, Chapter 23

Borenstein, Severin. "Cap-and-Trade and Innovation." *EnergyatHaas.wordpress.com* 2 April 2018.

T Nov 13: Electricity markets and climate change

US EIA. "EIA uses two simplified metrics to show future power plants' relative economics." 29 March 2018. www.eia.gov/TodayInEnergy.

US EIA. "Electric generator dispatch depends on system demand and the relative cost of operation." 17 August 2012. www.eia.gov/TodayInEnergy.

Borenstein, Severin. 2012. "The Private and Public Economics of Renewable Electricity Generation." *Journal of Economic Perspectives* 26(1): 67-92.

Th Nov 15: Electricity markets and climate change

- Roberts, David. “The Economic Limitations of Wind and Solar Power.” *Vox.com* 24 June 2015.
- Holland et al. “Analysing environmental benefits from driving electric vehicles.” 9 August 2015. *Voxeu.org*.
- Plumer, Brad. “There are 2,100 new coal plants being planned worldwide — enough to cook the planet.” 9 July 2015. *Vox.com*.
- Davis, Lucas and Catherine Hausman. 2016. “Market Impacts of a Nuclear Power Plant Closure.” *American Economic Journal: Applied Economics*, 8(2): 92–122. [I will tell you which sections to focus on.]

T Nov 20: Transportation markets and climate change

- Davis, Lucas. “Getting Energy Prices Right.” 7 March 2016. *Energyathaas.wordpress.com*.
- Davis, Lucas. 2017. “The Environmental Cost of Global Fuel Subsidies.” *The Energy Journal* 38: 1-21.
- Davis, Lucas. “Addicted to Oil: U.S. Gasoline Consumption is Higher than Ever.” 25 September 2016. *TheConversation.com*.
- Sallee, James. “Does CAFE Work?” 8 April 2018. *Energyathaas.wordpress.com*.

T Nov 27: Fracking and the climate

- Plumer, Brad. “Can natural gas help tackle global warming? A primer.” 29 August 2012. *The Washington Post – Wonkblog*.
- Newell, Richard and Daniel Raimi. 2014. “Implications of Shale Gas Development for Climate Change.” *Environmental Science & Technology* 28: 8360-8368.
- Hausman, Catherine and Ryan Kellogg. “Welfare and Distributional Implications of Shale Gas.” *Brookings Papers on Economic Activity*. [Just read section VI.A. “Global Environmental Impacts.”]

Th Nov 29: Methane and the climate

- Marchese, Anthony and Dan Zimmerle. 2 July 2016. “The US natural gas industry is leaking way more methane than previously thought. Here’s why that matters.” *TheConversation.com*.
- Raimi, Daniel. “California’s Aliso Canyon methane leak: climate disaster or opportunity?” 19 January 2016. *TheConversation.com*.
- Konschnik, Kate and Sarah Marie Jordaan. “How to reduce methane emissions from the oil and gas industry across North America.” 13 February 2018. *TheConversation.com*.
- Hausman, Catherine. “Why utilities have little incentive to plug leaking natural gas.” 9 August 2016. *TheConversation.com*.