

Topics in Environmental Values & Society: Decarbonizing Infrastructure, Energy, and Transportation Systems

NYU Department of Environmental Studies
ENVST-UA 450.004
Spring 2022

Tuesday and Thursday, 12:30 p.m. – 1:45 p.m.
GCASL - 238 Thompson St., Room 274

Zoom link (when needed):

<https://nyu.zoom.us/j/98960943239?pwd=RXU4eGUvL0ZmTW02aWJNNTU0QIZOdz09>

Passcode: climate

Professor

Derek Sylvan - derek.sylvan@nyu.edu

Office hours: By appointment via phone, Zoom, or in person (Office - Wilf Hall 318)

Course Description

In order to meaningfully address climate change, the United States (and other countries) will need to transition to a net-zero-emissions economy by mid-century. This will require widespread infrastructure modernization and major transformations in energy, transportation, and other sectors. This course will explore options for achieving deep decarbonization in these areas through both policy and technological advancement, as well as governance structures with the ability to affect change. The course will cover major topics in energy policy, transportation policy, sustainable infrastructure, technology research and development, U.S. federal and state policymaking, and political economy.

Texts

Texts for this course will be made available online through NYU Brightspace.

Disability Disclosure Statement

Academic accommodations are available for students with disabilities. The Moses Center website is www.nyu.edu/csd. Please contact the Moses Center for Student Accessibility (212-998-4980 or mosescsd@nyu.edu) for further information. Students who are requesting academic accommodations are advised to reach out to the Moses Center as early as possible in the semester for assistance.

Academic Integrity, Plagiarism, and Cheating

(Adapted from the website of the College of Arts & Science, <https://cas.nyu.edu/content/nyu-as/cas/academic-integrity.html>):

Academic integrity means that the work you submit is original. Obviously, bringing answers into an examination or copying all or part of a paper straight from a book, the Internet, or a fellow student is a violation of this principle. But there are other forms of cheating or plagiarizing which

are just as serious — for example, presenting an oral report drawn without attribution from other sources (oral or written); writing a sentence or paragraph which, despite being in different words, expresses someone else's idea(s) without a reference to the source of the idea(s); or submitting essentially the same paper in two different courses (unless both instructors have given their permission in advance). Receiving or giving help on a take-home paper, examination, or quiz is also cheating, unless expressly permitted by the instructor (as in collaborative projects).

Requirements

Students are required to attend every class session and complete all the assigned reading. Absences will be counted against a student's participation grade unless specifically approved by the instructor. Details on pandemic-related accommodations are below.

Forum posts

Students are expected to post on the Brightspace forum for each class session. Posts can consist of a short paragraph or a few bullet points highlighting questions or reactions to the readings for that class. Occasionally the professor will provide a more specific prompt for forum posts. Posts are due by 10 a.m. on the day of class. Certain class sessions (mid-term exam, presentations, etc.) will be exempt from the posting requirement.

News presentations

Each student will sign up for two short news article presentations. For each presentation, a student should select a news article that is relevant to the course topics, present the key points of the article (in 2-3 minutes), and help facilitate a class discussion about connections to course themes.

Midterm exam

A midterm exam focusing on topics covered during the first portion of the course will be conducted in class on March 10.

Case study presentation

Working in groups of 2-3, students will be responsible for presenting a 7-10 minute case study focused on a technology, policy, or company that offers relevant lessons on decarbonization strategies. Topics must be approved in advance, and students must submit slide decks and a list of citations on the day of the presentation. Students contributions will be graded individually based on the assignment rubric.

Final paper and presentation

Students will submit a final paper of 900-1200 words, evaluating a specific decarbonization policy or strategy of their choosing. Topics must be approved in advance. Each student will be responsible for sharing the key takeaways of their paper in a ~3 minute presentation.

All written assignments and slide decks must be emailed to derek.sylvan@nyu.edu in Word, PDF, or PPT format (no Google Doc links). Forum posts should be submitted on Brightspace.

Late assignments will only be accepted if a student has a very good excuse and notifies the professor by the submission time at the latest. The only exceptions to this policy are at the absolute discretion of the professor and will result in a reduced grade.

Pandemic-Related Adjustments

In the event that a student needs to be out of class, please contact the instructor as soon as possible at derek.sylvan@nyu.edu. Relevant materials will be available on NYU Brightspace, and students who are unable to attend in person can follow course sessions live via the course [Zoom link](#) (passcode: climate). If a student needs to be out of class and cannot attend on Zoom, we will record sessions and make them available in NYU Brightspace.

In the event that the course needs to be offered entirely online for a particular class meeting, we will meet synchronously at the standard class time using [Zoom](#) (passcode: climate). Additional instructions about particular details of class meetings or work will be emailed to you in the event of a shift to online instruction.

Grading Breakdown

Final paper: 25%

Final paper presentation: 5%

Midterm exam: 25%

Case study presentation: 15%

Attendance and participation: 10%

News presentations: 10%

Forum posts (on Brightspace): 10%

Schedule

(Readings below are to be completed by the class date listed)

1. January 25

Course overview and introduction; Understanding the GHG emissions landscape; Net-zero emissions goals

2. January 27

Overview of infrastructure and climate change

Readings:

- E. Larson et al., "[Net-Zero America: Potential Pathways, Infrastructure, and Impacts](#)" (Executive summary)
- Kaya et al., "Towards net zero CO₂ emissions without relying on massive carbon dioxide removal"
- St. John, "[How the infrastructure bill will fight climate change and advance clean energy](#)"

3. February 1

The U.S. Electricity System

Readings:

- FERC, "[Energy Primer](#)" (p. 35-66)

4. February 3

Zero-emissions electricity

Readings:

- Muyskens and Eilperin, "[Biden calls for 100 percent clean electricity by 2035. Here's how far we have to go.](#)"
- Spector, "[90% Clean Grid by 2035 Is Not Just Feasible, But Cheaper, Study Says](#)"

5. February 8

Electric utilities, public utility commissions, and FERC

Readings:

- Girouard, "[How Do Electric Utilities Make Money?](#)"
- Roberts, "[This federal agency is quietly, profoundly shaping climate policy](#)"

6. February 10

Key state-level climate policies

- Morris, Farmer, and Damrosch, "[Climate Leadership and Community Protection Act Primer](#)"
- NRDC, "[Race to 100% Clean](#)"

7. February 15

Reducing emissions from buildings; Hydrogen's role in decarbonization

Readings:

- IPCC, "[Buildings \(AR-5 Chapter 9\)](#)" (Executive summary)
- Leung, "[Decarbonizing U.S. Buildings](#)"
- McNamara, "[What's the Role of Hydrogen in the Clean Energy Transition?](#)"

8. February 17

Fossil-fuel infrastructure and carbon removal

Readings:

- Kolbert, "[Can Carbon Dioxide Removal Save the World?](#)"
- Global CCS Institute, "[Transporting CO₂](#)"
- Lee, "[Should feds plug 'orphan' wells? States offer a warning](#)"
- Richards, "[Interior reveals plans for orphan well cleanup](#)"

9. February 22

Decarbonizing heavy industry and construction

Readings:

- Friedmann et al., "[Low-Carbon Heat Solutions for Heavy Industry](#)" (Read Executive Summary, skim p. 10-28)
- Akbarnezhad and Xiao, "Estimation and Minimization of Embodied Carbon of Buildings."

10. February 24

Surface transportation emissions

Readings:

- Butner and Davis Noll, "[A Pileup: Surface Transportation Market Failures and Policy Solutions](#)"

11. March 1

Non-vehicle policies and impacts

Readings:

- Valentine, "[How Race Shaped America's Roadways And Cities](#)"
- Berkeley Law, "[California Low Carbon Fuel Standard Fact Sheet](#)"

12. March 3

Electric vehicles and charging infrastructure

Readings:

- Wood Mackenzie, "[Future Energy – Electric Vehicles](#)"
- E. Larson et al., "[Net-Zero America: Potential Pathways, Infrastructure, and Impacts](#)" (p. 43-55)

13. March 8

Public transportation and urban planning

Readings:

- Higashide et al., "[A Green New Deal for City and Suburban Transportation](#)"
- Roberts, "[Could Barcelona's plan to push out cars and build superblocks work in the US?](#)"

14. March 10

Midterm exam (given during class)

15. March 22

Aviation and shipping

Readings:

- JetBlue, "[Environmental Social Governance Report](#)" (p. 28-57)
- Mufson, "[United Airlines aims to suck carbon dioxide from the friendly skies](#)"
- Marcell et al., "[A Sea Change](#)"

16. March 24

Infrastructure planning, permitting, and siting

Readings:

- Rand and Hoen, "Thirty years of North American wind energy acceptance research: What have we learned?"
- Mackler and Nellenbach, "[America's National Climate Strategy Starts with NEPA](#)"

Case study teams and topics due March 29

17. March 29 (Case study topics due)

Technology-push policies

Readings:

- Mazzucato and Semieniuk, “Public financing of innovation: new questions”
- Yang and Oppenheimer, “A Manhattan Project for Climate Change?”
- DOE, [Advanced Research Projects Agency-Energy: Annual Report](#) (skim)

18. March 31

Demand-pull policies

Readings:

- Hansen et al., “Beyond Technology Push vs. Demand Pull...”
- National Governors Association, “State Strategies for Advancing the Use of Energy Storage”

19. April 5

Financing and grants

Readings:

- Coalition for Green Capital, “[Green Banks in the United States](#)”
- DOE, “[Loan Program Office Annual Portfolio Status Report](#)”

20. April 7

Political economy, jobs, competitiveness, and equity

Readings:

- Bergquist et al., “Combining climate, economic, and social policy builds public support for climate action in the US”
- Institute for Policy Integrity, “[Does Environmental Regulation Kill or Create Jobs?](#)”
- News articles TBD

Case study slide decks (with citations) due April 12

21. April 12

Case study presentations

22. April 14

Case study presentations (continued)

Final paper topics due by April 19

23. April 19 (*Final paper topics due*)

Federal procurement policy and climate impacts

Readings TBD

24. April 21

Military infrastructure and procurement

Readings:

- Ward, “[‘All hell breaking loose’: How the Pentagon is planning for climate change](#)”
- Noor, “[How the US military fuels climate change](#)”
- Cho, “[What the U.S. Military is Doing About Climate Change](#)”

25. April 26

International cooperation and competition

Readings:

- CEMAC, “Benchmarks of Global Clean Energy Manufacturing”
- Buckley & Nicholas, “China’s Global Renewable Energy Expansion”
- News article(s) TBD

26. April 28

Food system infrastructure and logistics

Guest speaker: Kate Shearer, Sodexo

Readings TBD

Final papers and presentations due May 3

27. May 3

Final paper presentations

28. May 5

Final paper presentations (continued); Course conclusions

Student Wellness:

In a large, complex community like NYU, it's vital to reach out to others, particularly those who are isolated or engaged in self-destructive activities. Student wellness

(<https://cas.nyu.edu/content/nyu-as/cas/academic-programs/student-wellness.html>) is the responsibility of all of us.

The NYU Wellness Exchange is the constellation of NYU’s programs and services designed to address the overall health and mental health needs of its students. Students can access this service 24 hours a day, seven days a week - wellness.exchange@nyu.edu; (212) 443-9999. Students can call the Wellness Exchange hotline (212-443-9999) or the NYU Counseling Service (212-998-4780) to make an appointment for Single Session, Short-term, or Group counseling sessions.