

Clean Energy and Innovation

ENVST-UA 900

Fall 2019

Monday, 5:00 p.m – 7:30 p.m.

60 5th Ave, Rm 202

Professor

Derek Sylvan - derek.sylvan@nyu.edu

Office hours: By appointment, Wilf Hall 318

Course Description

In this capstone seminar, students will explore the government's role in accelerating technology development, assess how various policies could help meet climate and energy goals, and craft recommendations for how policymakers can help spur the advancement and adoption of promising energy technologies.

Students will research past government technology policies and programs and assess their relevance to clean energy development. The course will then explore various programs and policy tools that aim to spur energy innovation and help deploy promising technologies, including the Department of Energy's ARPA-E program, the national labs, federal and state renewable energy policies, patent policies, and infrastructure plans. Students will assess how these tools could be used to achieve climate, energy, and economic goals, and then craft policy recommendations.

Students will be exposed to a variety of important concepts related to energy technology, public policy, scientific innovation, and economics. They will synthesize these concepts and develop policy recommendations that account for the real-world constraints of policymaking. As part of this process, students will also hone their skills in policy analysis, writing, and oral presentation.

Texts

Texts for this course will be made available through NYU Classes.

Disability Disclosure Statement

Academic accommodations are available to any student with a chronic, psychological, visual, mobility, learning disability, or who is deaf or hard of hearing. Students should please register with the Moses Center for Students with Disabilities at 212-998-4980.

NYU's Henry and Lucy Moses Center for Students with Disabilities

726 Broadway, 2nd Floor New York, NY 10003-6675

Telephone: 212-998-4980 Voice/TTY Fax: 212-995- 4114

Web site: <http://www.nyu.edu/csd>

Plagiarism and Academic Support

Plagiarism includes: copying sentences or fragments from any source without quotes or references; not citing every source used in your papers; citing internet information without proper citation; presenting someone else's work as your own; or copying verbatim from any source. Plagiarism often results in failure in the class and referral to an academic dean. You are subject to CAS's guidelines on plagiarism: <https://cas.nyu.edu/content/nyu-as/cas/academic-integrity.html>.

Requirements

Students are required to attend every class session and complete all of the assigned reading. In addition, each student will be assigned to a small research team of 2-3 people, and each team will collaboratively be responsible for:

- **Compiling research documents on four assigned topics**
 - For each topic, the team should submit a single document that includes:
 - ~ 1 page cover note highlighting key findings (can be slightly longer to accommodate charts, etc.)
 - All factual claims must include citations
 - Headings, bullet points, etc. are encouraged
 - Annotated bibliography
 - ~ 3 sources per person
 - Citation (APA style) and hyperlink (if available) for each source
 - Description of content and key data/conclusions from that source
- **Presenting research findings to the class and leading short class discussions**
- **Posting on the course message board as required**
- **Competing a case study on a relevant project/policy** (*completed individually, max 1000 words*)
- **Authoring a policy memo** (max 1500 words)
- **Preparing and presenting sections of the final capstone presentation.**

All written assignments/deliverables (research documents, message board posts, case studies, policy memos, presentations) must be submitted by 10 a.m. the morning of the due date. Please post documents to NYU Classes AND email the document to the professor.

Late assignments/deliverables will only be accepted if you have a very good excuse and notify 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.

Grading Breakdown

Research documents: 40%

Class presentations: 5%

Case study: 15%

Policy memo: 25%

Contribution to capstone presentation/slides: 5%

Attendance and participation: 10%

Schedule

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

9/9

Course overview and introduction; Understanding the climate and energy landscape; Legislative options for climate and energy policy

9/16

Economics of R&D and federal role in technology development; Past government technology innovation efforts

Readings:

- Yang and Oppenheimer, "A Manhattan Project for Climate Change?"
- Bernanke, "Promoting Research and Development..."
- Mazzucato and Semieniuk, "Public financing of innovation: new questions"
- Mowery et al., "Technology Policy and Global Warming..."
- Stine, "The Manhattan Project, the Apollo Program and Federal Energy..."

Due 9/23:

- Group research document #1 and accompanying presentation

9/23

Current state of key clean energy technologies; Innovation policy risks

Readings:

- IEA, "Renewables 2018" - Executive Summary
- Kolbert, "Can Carbon Dioxide Removal Save the World?"
- LaVine, "Battery Powered: The Promise of Energy Storage"
- Levi, "The Hidden Risks of Energy Innovation"

9/30

Technology-push programs and policy tools; Patents

Readings:

- Zaidi, "Advancing the Frontiers of Clean Energy"
- ACS Energy Letters, "ARPA-E: Accelerating US Energy Innovation"
- DOE, "ARPA-E: The First Seven Years" (skim)
- DOE, "Loan Program Office Financial Performance"
- DOE, "Annual Report on the State of the DOE National Laboratories" (skim)
- Bettencourt et al., "Determinants of the Pace of Global Innovation..."

Due 10/7:

- Group research document #2 and accompanying presentation

10/7

Demand-pull policy tools, deployment, and market adoption

Readings:

- Hansen et al., “Beyond Technology Push vs. Demand Pull...”
- Gaddy, “The Innovation vs. Deployment Debate in Energy...”
- Kaufman and Gordon, “The Energy, Economic, and Emissions Impacts of a Federal US Carbon Tax”
- National Governors Association, “State Strategies for Advancing the Use of Energy Storage”

Due 10/15:

- Group research document #3 and accompanying presentation
- Case study topic choice (individual assignment)

10/15 – NOTE: NO CLASS ON MONDAY 10/14; CLASS WILL BE HELD TUESDAY 10/14

Green infrastructure, jobs, and multiplier effects

Readings:

- Vickerman, “...Economic Benefits of Transport Infrastructure Investments”
- EPA, “The Economic Benefits of Green Infrastructure: Case Study”
- Jones et al., “Job Impacts of California’s Renewable Portfolio Standard”
- Institute for Policy Integrity, “Does Environmental Regulation Kill or Create Jobs?”

Due 10/21:

- Group research document 4 and accompanying presentation

10/21

International competition and cooperation

Readings:

- CEMAC, “Benchmarks of Global Clean Energy Manufacturing”
- Buckley & Nicholas, “China’s Global Renewable Energy Expansion”
- Ferris, “Energy Storage is America’s Industry to Lose”

Due 10/28:

- Completed case studies (individual assignment)

10/28

Energy politics and goal setting; Developing policy recommendations

Readings:

- MIT, “The Future of Solar Energy – Summary for Policymakers”
- Center for Carbon Removal, “Carbon Removal Policy: Opportunities for Federal Action”

Due 11/4:

- Case study presentations
- Policy memo outlines

11/4

Oral presentation workshop; Case study presentations

Due 11/11:

- Questions on Urban Future Lab companies (on NYU Classes Forum)

11/11

Visit to Urban Future Lab

Readings:

- Urban Future Lab background materials (sent via email)

Due 11/18:

- Policy memo
- Policy memo presentations

11/18

Policy memo presentations; Debate policy recommendations

Readings:

- TBD articles on recent news/policy developments

Due 11/25:

- Capstone presentation slides – first draft

11/25

Presentation run-through and feedback

Readings:

- TBD articles on recent news/policy developments

Due 12/2:

- Capstone presentation slides – final draft

12/2

Final presentation run-through and feedback; Course conclusions

12/9

Final capstone presentations