

Climate Change, Energy, and Social Justice

SOCI 144-01 (CRN 17500) / CHEG 432 (CRN 13509) / CHEG 632

Spring 2015

Wednesdays 5:10-7:40 pm, Douglass Hall 205

Instructor: Darshan M.A. Karwat, PhD

Visiting Professor at Howard University

AAAS Fellow at the US DOE

Postdoctoral Fellow at the University of Michigan

Office hours: Douglass Hall 210 E

Thursdays 2-3:30 pm or by appointment

Email (for now): dippind@umich.edu

Purpose

This discussion-based class will provide students with a critical interdisciplinary understanding of

- what climate change is,
- how current energy use contributes to climate change, and
- the social justice impacts of energy use, climate change and responses to climate change.

This class will provide students with foundational and critical information on climate change and energy, the justice implications of climate change and responses to it, as well as, importantly, the opportunity to do something about it.

Technical students will be exposed to non-technical social theory, and non-technical students will be exposed to the scientific process and decision-making.

Motivation

The motivation for this class is multifold, with the founding premise of the class being that systemic socioeconomic, political, technological, moral and ethical change is needed to fully grapple with climate change. Issues of climate change and social justice are inextricable. While our current modes of energy use based on fossil fuel combustion continue to drive climate change, fossil fuel use is intimately woven into our daily lives and deeply influences our politics and governance, at scales from the local to the global. Confronting climate change and changing the current energy system requires more than just simplistic arguments to move away from fossil fuels. Indeed, many “alternative” energy sources being developed under the neoliberal economic framework continue to have degrading impacts on the environment and social justice.

Class structure, format and makeup

This three-credit class will be **seminar-based**, meeting once a week for three hours for instruction, presentations and discussions. There may be guest lectures from experts in different areas of energy, climate, and social justice. Time will be set aside for weekly updates on work related to the semester-long project; updates on key energy and climate change-related news. Undergraduate students will be given 70-100 pages of reading per week, and graduate students will be given an additional 30-50 pages, including reports, journal papers, and book chapters.

The class **draws on** scientific literature, engineering case studies, ethics, justice, and sociological science and technology studies.

The **class makeup** will be interdisciplinary—all technical and non-technical students will be essential participants in the class. Credit will be given for both undergraduate and graduate students; graduate students will be graded separately from undergraduate students.

While all students are not expected to have a technical background and previous exposure to topics in energy, climate change, or justice, students should come into the class with basic algebra skills to analyze energy flows and budgets in the

Earth system, as well as skills to critically read, analyze, and critique writing. This class will require significant amounts of independent and original work. ***Most importantly, students must be open to work with students with different educational backgrounds and personal experiences.***

Slides will be uploaded to Blackboard at least three hours before class starts.

Required text: David Archer, *Global Warming: Understanding the Forecast*, John Wiley & Sons, 2012, ISBN: 978-0-470-94341-0

Student outcomes

- Strong critical reading around complex sociotechnical issues like energy and climate change,
- Being able to write clearly and succinctly on complex issues for public consumption
- Strong independent research skills
- Strong presentation skills
- Professional conference organizing skills

Discussion and presentations

The success of this class will be based in large part on the engagement of all participants. This includes reflecting critically on readings, provoking constructive discussions, and drawing linkages between your education, personal experiences and course materials. All students are expected to come to class fully prepared for active discussion.

Each week, two students will come prepared to lead class discussion. These students will prepare class handouts (and perhaps a presentation, if presenters would like) based off of the reading for that week and their personal research. Presentations should be fifteen to twenty minutes and will be followed by a thirty to forty minute discussion. Both presenting students must participate equally in the planning and conducting of the presentation to get full credit.

Note: Discussion requirements and expectations subject to change depending on class enrollment

Writing and presentations

This class emphasizes critical reflection and expansive thought in writing as well as strong presentation skills.

- **Weekly blog:** You will work with one randomly selected colleague for the semester as a teammate to write a word weekly blog post (undergrad: 900 words; grad: 1000 words) on the class blog (see schedule). You must reference at least two other academic articles/blogs/books in each blog post that are relevant to that week's post. (I will provide a list of some readings that may be helpful to you.) This response should *not* be a summary of the reading, but rather reflections on and critical analyses of it.
- **Synthesis blog:** You will work with your teammate on writing two synthesis blog posts that are twice the length of your weekly responses (see schedule). You are expected to draw connections between readings from the synthesis blog week and from the weeks prior. Again, it must be analytical and critical.
 - You must post your blog piece no later than eight (8) pm the night before class to give your colleagues enough time to read and reflect on them (and comment on them, if you feel like!). Reading colleagues will be assigned. You must ***Late reflections will be penalized by 1% of the assignment grade per minute late.*** **Please bring a printed copy of your blog to class to turn in for grading. Do not read other students' blogs before you post yours. There will be an honor code for this.** Sign each blog with the names of people writing together.
- **Symposium organizing:** You will work with your peers in this course and with students in SOCI 199 (Environmental Inequalities & Sustainability: Race, Class, and Geography) to organize a symposium that is technically rich and

substantive on the interrelated issues of climate, energy, justice, race and class. You will organize the venue and program presentations, invite speakers and promote the symposium, and take care of all other logistical aspects to ensure a professional symposium. The broader Howard University community—including students, faculty, and staff—selected federal agency professionals and Washington, DC-based environmental organizations will be invited to participate.

Note: Assignment and presentation requirements and expectations subject to change depending on class enrollment

Grading

Students will be graded on class participation, reading responses on the blog, and organizing a symposium. Graduate students will be graded separately from undergraduate students.

Undergraduate	Graduate
Class participation: 20%	Class participation: 15%
Leading discussion: 7%	Leading discussion: 6%
Weekly blog posts: 45%	Weekly blog posts: 54%
Synthesis blog post 1: 9%	Synthesis blog post 1: 9%
Synthesis blog post 2: 9%	Synthesis blog post 2: 9%
Organizing symposium: 10%	Organizing symposium: 7%
A: 90-100; B: 80-89; C: 70-79; D: 60-69	A: 90-100; B: 80-89; C: 70-79; D: 60-69

You may also be evaluated by your peers/teammate and if so, I may consider this evaluation when assigning grades.

A: 90-100; B: 80-89; C: 70-79; D: 60-69

Note: Grading breakdown subject to change depending on class enrollment

Academic Integrity

Plagiarism will not be tolerated; an assignment that evidences plagiarism will receive a zero (see the “Academic Code of Conduct” in the Student Reference Manual), and will be reported to the Dean.

Americans with Disabilities Act (ADA)

Howard University is committed to providing an educational environment that is accessible to all students. In accordance with this policy, students who need accommodations because of a disability should contact the Dean for Special Student Services (202 238 2420). If you need a special accommodation required by the ADA, please document and discuss your disability with me during the first two weeks of class.

Course policies

- The classroom will be a space of respect, honesty, self-responsibility, and collaborative thinking, and will be an environment to help all of us—including the instructor and guest lecturers—address the urgent socioecological challenge of climate change. We are all in this together.
- We will be addressing topics that are controversial and provocative, and that may challenge people’s worldviews.
- We must all acknowledge that there are a variety of perspectives on the complex issues we will discuss, and each participant in class is always free to express their opinions; however, you may be asked to question your own opinions openly.
- You are free to disagree with the conclusions of the instructors and presenters, your peers and colleagues, or the authors you read.

- Your prepared, on-time presence in class without distraction will make the classroom an incubator of discussion, learning, growth, and action.
- Academic integrity is essential in every pursuit. Citing and referencing the ideas of others in your own work will give others confidence in it, even if they disagree with you.
- Laptop policy: Because of the size of the class, laptops will not be allowed for taking notes. There will be some class activities that will require laptops, so please bring one if you have one.
- Absences and coming to class late will not be allowed other than for extenuating circumstances. If you think you won't be able to make class, please inform me prior to class and make-up arrangements will be made.

Class outline (note: course syllabus and readings subject to change, significant advance notice will be given)

Week 1, Jan 14, 2015: Introduction: Where are we coming from? A teaser on climate change and justice

- The discovery of climate change: the Keeling Curve and [interactive views](#) of the Earth's climate
- Energy use in the US and the world and [countries responsible](#) for climate change
- Your questions about climate, climate change, energy, and justice
- The politics of climate change
- Blogs: examples and expectations

Week 2, Jan 21, 2015: The Basics of the Climate System

- Climate vs. weather
- What is energy?
- Energy balance of the Earth
 - Light, electromagnetism, and blackbody radiation
 - The conservation principle
 - The greenhouse effect
- Reading a scientific paper
- Reading
 - David Archer, *Global Warming: Understanding the Forecast*, Blackwell, Chapters 2-3, **20 pgs**
 - Paul Edwards, *A Vast Machine*, Introduction, Chps. 1-2, **50 pgs**
 - Watch [BBC Climate Wars, Part 1](#)
 - Naomi Klein, [Why #BlackLivesMatter Should Transform the Climate Debate](#), December 12, 2014, *The Nation*
 - Steven Hsieh, [People of Color Are Already Getting Hit Hardest by Climate Change](#), April 21, 2014, *The Nation*

Week 3, Jan 28, 2015: Basics of the Climate system (with guest speaker Dr. Aaron Goldner, AAAS Fellow, US Department of Energy)

- How do we know about the climate?
- The carbon budget
- How does the Earth's climate respond to an increase of carbon dioxide?
 - Feedbacks: If Earth warms a little bit, does the Earth respond by cooling a little bit or by enhancing the warming?
- Past variability and historical context
- Reading a scientific paper
- Reading
 - Watch [BBC Climate Wars, Part 2](#)
 - Paul Edwards, *A Vast Machine*, The Infinite Forecast (Chp. 7), and Simulation Models and Atmospheric Politics (Chp 14) **48 + 40 pgs**
 - *Spencer Weart, *The Discovery of Global Warming, Simple Climate Change Models*, **32 pgs**

Week 4: Feb 4, 2015: Projections of Climate Change

- The nature of greenhouse gas emissions – lifetimes and global warming potential
- What are the observations and projections?
 - Atmospheric carbon dioxide and climate
- What needs to be done? IPCC requests and radical decarbonization
 - Paul Edwards, *A Vast Machine*, and Signal and Noise (Chp 15), Conclusions, **33 + 10 pgs**
 - Simon Shackley and Brian Wynne, *Representing Uncertainty in Global Climate Change Science and Policy: Boundary-Ordering Devices and Authority*, STHV, **28 pgs**

- *The Guardian* "[Climate Change and sensitivity: not all Watts are equal](#) "
- *Drew Shindell, *Inhomogeneous forcing and transient climate sensitivity*, Nature 2014
- *Paul Edwards, *A Vast Machine*, Parametrics and the Limits of Knowledge, Chp 13, **18 pgs**
- Watch [BBC Climate Wars, Part 3](#)
- **Blog 1 due Feb 3**

Week 5, Feb 11, 2015: Energy use and the Causes of Climate Change

- How does current energy use cause climate change?
- What kinds of energy are being used, and where?
- Emissions statistics, responsibility of emissions, rich and poor, east and west, global north and south
- How does combustion lead to greenhouse gas emissions?
- How much more fossil fuel is left?
- Reading
 - Bill McKibben, [Global Warming's Terrifying New Math](#), 19 July 2012, *Rolling Stone*, **9 pgs**
 - Christophe McGlade and Paul Ekins, *The geographical distribution of fossil fuels unused when limiting global warming to 2 degrees C*, *Nature*, 2015, **4 pgs**
 - Clark A. Miller, *Energy Justice: Ensuring human dignity in the post-carbon future* in *The Cairo Review of Global Affairs*, Spring Issue, 2012, **14 pgs**
 - Richard G. Newell and Stuart Iler, *The Global Energy Outlook* in Jan H. Kalicki and David Goldwyn, *Energy and Security* (2013), **44 pgs**
 - Richard Heede, *Tracing anthropogenic carbon dioxide and methane emissions to fossil fuel and cement producers, 1854-2010*, in *Climatic Change* **12 pgs**
 - May Hope, [How much of China's carbon dioxide emissions is the rest of the world responsible for?](#) The Carbon Brief
 - Watch Kevin Anderson's 2012 [Cabot Lecture](#)
- **Blog 2 due Feb 10**

Week 6, Feb 18, 2015: The Social Contexts of Technology and Technological Outcomes

- How can we evaluate the social, economic, political and justice outcomes of a technology?
- Can the same technology have positive outcomes in one place, and negative outcomes in another?
- How do we create and understand data, and how does this affect what we do scientifically and technologically?
- Reading
 - Bryan Pfaffenberger, *The Harsh Facts of Hydraulics: Technology and Society in Sri Lanka's Colonization Schemes*, 1990, **35 pgs**
 - David Nye, *Consuming Power*, 1998, Introduction, Chp 5, Chp 7, Chp 9 (**12 + 23 + 28 + 15 pgs**)
- **Blog 3 due Feb 17**

Week 7, Feb 25, 2015: Energy, Environmental Justice, and Energy Justice

- What are the social impacts and social justice outcomes of energy use?
- Who benefits from energy extraction and use? Who bears the costs?
- What are the non-climate impacts of energy extraction and use? Air and water pollution
- Reading
 - Beverly Wright, *Living and Dying in Louisiana's "Cancer Alley"*, *The Quest for Environmental Justice*, **30 pgs**
 - Lara Clark, Dylan Millet, and Julian Marshall, *National Patterns in Environmental Injustice and Inequality: Outdoor NO2 Air Pollution in the United States*, *PLoS One*, **8 pgs**,
<http://www.epa.gov/oaqps001/nitrogenoxides/>
 - James Rust, [Environmentalists Use Environmental Justice to Kill Millions Per Year](#)

- Charles Blow, "[Inequality in the Air We Breathe?](#)" NYTimes, 21 January 2015
- David Schlosberg, *Defining Environmental Justice*, Chp 3, **34 pgs**
- **Blog 4 due Feb 24**

Week 8, Mar 4, 2015: Energy, Environmental Justice, and Energy Justice (contd.)

- Andrew Zimmerman, *Toward a More Democratic Ethic of Technological Governance*, STVH, **22 pgs**
- Clark A. Miller, *The Ethics of Energy Transitions*, **5 pgs.**
- Benjamin Sovacool, *Energy and Ethics*, Chp 3: Affordability and Fuel Poverty in England, **22 pgs**
- Jeremy Miller, *Fueling the Future: In search of a national energy policy*, Orion, Jan-Feb 2015, **6 pgs**
- **Blog 5 due Mar 3**

Week 9, Mar 11, 2015: Dealing with Climate Change: Mitigation, Adaptation, and Resilience

- What does climate change look like in the US and globally?
- Relation of climate change to other local and global issues
- What are the justice implications of climate change today?
- Non-fossil fuel-based energy sources – no silver bullet. What are the concerns of alternative energy?
- National Renewable Energy Lab and Department of Energy reports
- Reading
 - Climate Change 2014: Mitigation of Climate Change, SPM
 - [Special Report on Renewable Energy Sources and Climate Change Mitigation](#), pgs TBD
 - (watch) NOVA, [Saved by the Sun](#)
 - (watch) NOVA, [The Big Energy Gamble](#)
- **Blog 6 due Mar 10**

Week 10, Mar 16-20, 2015: Spring Break

Week 11, Mar 25, 2015: Climate Justice: The Impacts of Climate Change Mitigation and Adaptation

- What are the justice implications of climate change if nothing is done to promote policies of mitigation or adaptation?
- What are the social and environmental challenges associated with low or non-carbon fuels?
- What are the justice considerations in thinking about future energy use?
- Reading
 - Jordan P. Howell, *Risk society without reflexive modernization? The case from northwestern Michigan*, TiS, 2012, **11 pgs**
 - David Sims, [Rare Earths and Other Chemicals Damaging the Environmental Value of Renewables](#)
 - The Guardian and Le Monde, [Rare-earth mining in China comes at a heavy cost for local villages](#)
 - Nicola Jones, [A Scarcity of Rare Metals Is Hindering Green Technologies](#)
 - (Listen) Benjamin Walker, *Theory of Everything: Clouds*
- **Blog 7 due Mar 24**

Week 12, Apr 1, 2015: The Impacts of Climate Change Mitigation and Adaptation (continued)

- Reading
 - David Schlosberg and Lisette Collins, *From environmental to climate justice: climate change and the discourse of environmental justice*, WIREs Climate Change, **12 pgs**
 - Leonard J. Long, *How Not To Think About Climate Change Justice*, Quinnipiac Law Review, **25 pgs**
 - David Schlosberg, *Climate Justice, Vulnerability, and Adaptation: A Capabilities Approach*, 2011, **29 pgs**

- Benjamin Sovacool, *Energy and Ethics*, Chp 9: Responsibility and Ecuador's Yasuni-ITT Initiative
- Stranded assets Readings TBD
- Reading on climate debt, **pgs TBD**
- **Blog 8 due Mar 31**

Week 13, Apr 8, 2015: Climate Change and the Economy: EPA and 111(d)

- Carbon taxes and cap-and-trade
- The European Union Emissions Trading Scheme
- EPA 111(d) ruling
- Reading
 - Critical Currents: Carbon Trading: How it works and why it fails, 2009
 - Nicolas D. Loris, *Free Markets Supply Affordable Energy and a Clean Environment*, The Heritage Foundation, **9 pgs**
 - Sonja Boehmer-Christiansen, *Science, Equity, and the War Against Carbon*, STVH, **24 pgs**
 - Ashley Dawson, *Climate Justice: The Emerging Movement against Green Capitalism*, South Atlantic Quarterly, **26 pgs**
 - Naomi Klein, *This Changes Everything: Capitalism vs. The Climate*, Simon and Schuster, 2014
- **No blog due**

Week 14, Apr 15, 2015: Climate Change and Disasters: Hurricane Katrina

- What is the state of science linking extreme weather to climate change?
- Reading
 - W. Malcolm Byrnes, *Climate Justice, Hurricane Katrina, and African American Environmentalism*, Journal of African American Studies, 2014, **10 pgs**
 - Robert Bullard and Beverly Wright, *The Wrong Complexion for Protection: How the Government Response to Disaster Endangers African American Communities*, Chapter 3 - *The Legacy of Bias: Hurricanes, Droughts, and Floods*, **26 pgs**
 - Other readings TBD
- **Synthesis blog due April 18**

Week 15, Apr 22, 2015: Geoengineering and class wrap-up

- **No blog due**

Week 16, Apr 27-28, 2015: Final exams

Some other readings and resources

Climate and climate change

- [Intergovernmental Panel on Climate Change](#), Working Group I, *The Physical Science Basis: Summary for Policymakers*, 2014
- [Intergovernmental Panel on Climate Change](#), Working Group I, *The Physical Science Basis: Technical Summary*, 2014
- United States Global Change Research Program, *National Climate Assessment: Overview and Highlights*, 2014
- James Hansen, *Storms Of My Grandchildren: The Truth About the Coming Climate Catastrophe and Our Last Chance to Save Humanity*, Bloomsbury, 2010
- James Hansen, *The Case for Young People and Nature: A Path to a Healthy, Natural Prosperous Future*, 2011
- Spencer Weart, [The Discovery of Global Warming](#), Harvard University Press, 2003 & 2014,
- Warren Washington and Clare Parkinson, *An Introduction to Three-Dimensional Climate Modeling*
- Clark Miller and Paul Edwards, *Changing the Atmosphere: Expert Knowledge and Environmental Governance*
- Joseph DiMento and Pamela Doughton, *Climate Change: What it Means for Us, Our Children, and Our Grandchildren*

Energy Justice, political economy and political ecology

- Timothy Mitchell, *Carbon Democracy: Political Power in the Age of Oil*, Verso Press, 2011
- Darshan Karwat, W. Ethan Eagle, Margaret S. Wooldridge, *Are There Ecological Problems Technology Cannot Solve? The Case of Water Scarcity and Dams, Climate Change and Biofuels*, International Journal of Engineering, Social Justice and Peace, 2014
- Benjamin Sovacool, Roman Sidortsov, Benjamin Jones, *Energy Security, Equality and Justice*
- Karen Bickerstaff, Gordon Walker, Harriet Bulkeley, *Energy Justice in a Changing Climate*
- Benjamin K. Sovacool, *Energy & ethics : justice and the global energy challenge*
- Marilyn A. Brown and Benjamin K. Sovacool, *Climate change and global energy security: technology and policy options*
- Mary Odum, [Social justice and solar equity](#)
- Stefan Bouzarovski, [Social Justice and Climate Change: Addressing Energy Poverty at the European Scale](#)
- National Academies of Engineering, [Energy Ethics Project](#)

Climate Justice, political economy and political ecology

- Dale Jamieson, [Ethics and Intentional Climate Change](#), Climatic Change, 1996
- Dale Jamieson, [Climate Change, Responsibility and Justice](#) in *Science and Engineering Ethics*, 2009
- Vandana Shiva, *Soil Not Oil: Environmental Justice in a Time of Climate Crisis*. Cambridge, MA: South End, 2008
- Dennis Arnold, *The Ethics of Global Climate Change*, Cambridge University Press, 2011
- Tom Athanasiou and Paul Baer, *Dead Heat: Global Justice and Global Warming*, Seven Stories Press, NYC, 2002
- Intergovernmental Panel on Climate Change, Working Group II, *Impacts, Adaptation and Vulnerability: Summary for Policymakers*, 2014 <http://www.ipcc.ch/>
- James Garvey, *The Ethics of Climate Change: Right and Wrong in a Warming World*, Bloomsbury, 2008
- John Broome, *Climate Matters: Ethics in a Warming World*, W. W. Norton & Company, 2012
- National Association for the Advancement of Colored People, [Climate Justice Initiative](#)

Multimedia resources

- [From Fossil Fuels to Global Warming Denial, Koch Brothers May Be Biggest Force Behind U.S. Inaction](#)
- Video - ["Kumi Naidoo of Greenpeace on Obama's Peace Prize, Obama's War, Copenhagen and Climate Debt,"](#)
- Video - [Robert Bullard "Environmental Justice Professor Robert Bullard On How Race Affected the Federal Government's Response to Katrina"](#)
- Radio - [BBC - "Climate Wars" - Listen to Part 1 - 37 min](#) & [BBC - "Climate Wars" - Listen to Part 2 - 37 min](#)