

ENV 462H1: Energy and Environment: Economics, Politics, and Sustainability

I CONTACTS

INSTRUCTOR

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Instructor Bio: Adonis Yatchew's research focuses on energy, regulation and econometrics. Since completing his Ph.D. at Harvard University, he has taught at the University of Toronto. He has also held visiting appointments at Trinity College, Cambridge University, the University of Chicago and Australian National University, among others. He has written a graduate level text on semiparametric regression techniques published by Cambridge University Press. He has served in various editorial capacities at *The Energy Journal* since 1995 and as the Editor-in-Chief from 2007 to 2023. He has advised regulators, public and private sector companies on energy, regulatory and other matters for over 35 years and has provided testimony in numerous regulatory and litigation procedures. He currently teaches PhD. level courses in econometrics, and M.A. and undergraduate level courses on energy in the University of Toronto Department of Economics and the School of Environment. The energy courses are interdisciplinary, spanning economics, the environment and sustainability, politics, geopolitics and security. He has also taught short courses covering these areas at international conferences.

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II COURSE OVERVIEW

COURSE DESCRIPTION:

This interdisciplinary course examines key ideas in economics, politics/geopolitics and security that are essential to understanding energy and environmental issues. The course will cover energy markets, energy security, and the increasing role that sustainability plays in setting policies.

STUDENT LEARNING OUTCOMES:

The interdisciplinary nature of energy issues calls for a 'big ideas' approach to both energy teaching and research. The course will begin by suggesting ten 'big ideas' fundamental to understanding energy issues. They will help form a thematic framework for course material. Russia's invasion of Ukraine provides a powerful and tragic case study of the role that energy (and nuclear weapons) can play in magnifying geopolitical power. Consider that Russia's GDP in 2020 was less than that of Canada.

The course will cover energy markets – their successes and failures and outline basic remedies for the latter. It will discuss how energy security has shaped world politics in the 20th century and continues to do so in the 21st century. It will then proceed to a discussion of regulatory institutions, their design, efficiency and efficacy. Considerable time will be devoted to alternative energy resources. The importance of resources and energy in shaping Canada's past, present, and future will also be discussed. Whatever the specialization of the student, the course will seek to instill a search for connections with other disciplines, as well as the development of a broad perspective on understanding energy issues.

IN THE NEWS

Students will follow current issues in energy by signing up for news alerts (e.g., through Google Alerts). Subscribe to MIT Energy Initiatives updates by visiting <http://energy.mit.edu/news/>. Classes will usually begin with a brief discussion of the week's developments in energy. Students should regularly visit MIT Technology Review <http://www.technologyreview.com/> to review advances in energy. For insightful commentary on a range of issues, visit Project Syndicate which is available through our library system through <https://login.library.utoronto.ca/index.php?url=https://www.project-syndicate.org/>.

PREREQUISITE COURSE(S): none**READINGS:**

Required:

1. Daniel Yergin, *The New Map: Energy, Climate and the Clash of Nations*, Penguin Press, 2020.
2. Richard Muller, *Energy for Future Presidents, The Science Behind the Headlines*, Norton 2012.
3. Jaccard, M. *The Citizen's Guide to Climate Success*, Cambridge University Press, 2020. Entire pdf version available at <https://www.cambridge.org/core/books/citizens-guide-to-climate-success/49D99FBCBD6FCACD5F3D58A7ED80882D>
4. Bruce Usher, *Renewable Energy: A Primer for the Twenty-First Century*, Columbia University Press, 2019. Available electronically through University of Toronto libraries. Also, hardcopy and Kindle versions available.
5. Jaffe, Amy Myers. *Energy's Digital Future: Harnessing Innovation for American Resilience and National Security*, New York Chichester, West Sussex: Columbia University Press, 2021. <https://doi-org.myaccess.library.utoronto.ca/10.7312/jaff19682>

Supplementary Resources:

1. Freedom House <https://freedomhouse.org/> -- annual country reports and Freedom House map <https://freedomhouse.org/explore-the-map?type=fiw&year=2022>.
2. Encyclopedia of Energy, ed. Cutler Cleveland. Available electronically through UT Libraries.
3. BP (formerly British Petroleum) <https://www.bp.com/en/global/corporate/energy-economics/statistical-review-of-world-energy.html> Statistical Review of World Energy, see also the Statistical Review of World Energy Data (Excel spreadsheet). Both of these are now published by the Energy Institute <https://www.energyinst.org/statistical-review>. BP (formerly British Petroleum) www.bp.com/statisticalreview, Statistical Review of World Energy, Statistical Review Workbook (Excel spreadsheet).
4. Lawrence Livermore Laboratories. Energy and Carbon Flow Charts.
5. World Resources Institute – GHG gas data, slide presentation, papers, annual “Stories to Watch”.

III HOW THE COURSE IS ORGANIZED

1. Ten Big Ideas, (Weeks 1, 2)
 - a. Yatchew, A. 2014, “Economics of Energy: Big Ideas for the Non-Economist”, Energy Research and Social Science, 1(1), 74-82.
 - b. Jaccard – Ch. 1
 - c. Usher – Ch. 1, 2
2. Background and Introduction, (Weeks 3, 4, 5 Midterm will be held in Week 6)
 - a. Muller – Ch. 1-6.
 - i. Review of Richard Muller’s book by Bill McKibben: “The Scientist Who Made a Total Turnaround”, New York Review of Books, October 11, 2012.
 - ii. Reply by Richard Muller: “On Turning Down the Heat”, New York Review of Books, November 22, 2012.
 - b. Yergin, Introduction
3. Geopolitics, Politics and Regulation, (Weeks 7, 8, 9)
 - a. Yatchew, A. 2014, “Economics of Energy: Big Ideas for the Non-Economist”, Energy Research and Social Science, 1(1), 74-82.
 - b. Yergin, Russia’s Map Ch. 9-16, China’s Map Ch.17-25, Maps of the Middle East Ch. 26-36, Conclusion.
 - c. “2018 Diplomat of the Year Chrystia Freeland: Read the Transcript”, Foreign Policy, June 14, 2018, <https://foreignpolicy.com/2018/06/14/2018-diplomat-of-the-year-chrystia-freeland-read-the-transcript/>
 - d. Jaffe, Chapter 3, China’s Energy Strategy

4. Renewables, Environmental Issues and Policies (Weeks 10, 11, 12)
 - a. Usher Ch. 4, 5
 - b. Muller Ch. 3, 8-10, 16.
 - c. Jaccard, M. Ch. 4, 6, 10-12.
 - d. Brander, James, "Easter Island: Resource Depletion and Collapse", Encyclopedia of Energy, 2004 edited by Cutler Cleveland.
 - e. Nordhaus, William, "The Climate Club: How to Fix a Failing Global Effort", Foreign Affairs, May/June 2020.
 - f. Nordhaus, William, "The Pope & the Market", New York Review of Books, October 8 2015.
<http://www.nybooks.com/articles/archives/2015/oct/08/pope-and-market/>
 - g. Yatchew, A. 2016, "Rational vs. 'Feel-Good' Carbon Policy – Transferability, Subsidiarity and Separation" Energy Regulation Quarterly, 4:3, 31-40.
 - h. Climate Leadership Council, February 2017, "The Conservative Case for Carbon Dividends", available at
<https://www.clcouncil.org/media/2017/03/The-Conservative-Case-for-Carbon-Dividends.pdf>.
 - a. Yergin Climate Map Ch. 41-46.
 - b. Pineau, Pierre-Olivier "Canadian Energy in Multiple Crises: From Pipeline and Climate to Covid-19", Slides from webinar, April 15, 2020, posted on Quercus.

TUTORIAL OBJECTIVES:

Tutorials will supplement course materials, for example on how to analyse energy flow and carbon flow diagrams, writing of effective papers, and reviews of past midterms and exams.

IV EVALUATION/GRADING SCHEME

Evaluation for this course consists of a

- Midterm Tuesday February 13, 2024 (in class) worth 25%
- Research paper outline worth 10%, due by midnight Friday, March 1, 2024
- Research paper worth 40%, due by midnight Sunday March 31, 2024
- Final exam during the final exam period, worth 25%.

Late penalties of 10% per day will apply to the outline and the paper (e.g., on the paper, which is worth 40 marks, the penalty will be 4 marks per day).

Note: if an unexpected technical issue occurs with a university system (e.g., Quercus services, network outage) that affects availability or functionality, it may be necessary to revise the timing or weighting of the assessments.

RESEARCH PAPER OUTLINE: It must contain the following:

- a. Title
- b. Abstract not exceeding 250 words
- c. Research question and a clear thesis statement **in bold, which must take a position.**
- d. A list of key references (be sure to do a citation search)
- e. An outline of how your analysis will be conducted

RESEARCH PAPER: The target length should be about 3000 words, not including tables, graphs and bibliography. The structure of the paper should be as follows:

- a. Cover Page
 - i. Title, name and student number, date submitted, word count
 - ii. Abstract not exceeding 250 words
- b. Introduction – the last sentence in this section must contain the thesis statement.
- c. Literature Review
- d. Analysis
- e. Conclusions
- f. References

The “Conclusions” section should discuss policy implications. Moderately longer papers are acceptable. Use a citation format with which you are familiar (APA, Chicago...). Please submit the paper electronically through Quercus in pdf or Word format.

The primary criteria used in evaluating written work are the following:

1. **Thesis statement:** which must take a position. The purpose of the paper is to carefully adduce evidence supporting the thesis statement.
2. **Mechanics:** Your work must be completely free of grammatical errors, spelling errors or major factual errors. References can be in any style but the same format must be used consistently and they must be accurate.
3. **Writing style:** Your papers should be written in a clear and unambiguous style which assists, rather than impedes, communication with the reader.
4. **Structure:** Your written work should have a clear focus, provided by the research question, and a structure which logically flows from that focus.
5. **Precision and accuracy:** Precision means saying exactly and specifically what you mean, avoiding ambiguity and vague generalities. Accuracy refers to absence of major factual errors.
6. **Analysis:** Your analysis should display understanding of the topic and, based on that understanding, originality of thought.

V COURSE POLICIES

- You may communicate with the instructor or the TA by email, or during office hours.
- University statement regarding a positive learning environment: *"The University of Toronto is committed to equity, human rights and respect for diversity. All members of the learning environment in this course should strive to create an atmosphere of mutual respect where all members of our community can express themselves, engage with each other, and respect one another's differences. U of T does not condone discrimination or harassment against any persons or communities."*
- Privacy language and appropriate use of course materials:
<https://teaching.utoronto.ca/ed-tech/audio-video/sample-statements/>

VI TECHNOLOGY REQUIREMENTS

This course requires the use of computers, and of course sometimes things can go wrong when using them. You are responsible for ensuring that you maintain regular backup copies of your files, use antivirus software (if using your own computer), and schedule enough time when completing an assignment to allow for delays due to technical difficulties. Computer viruses, crashed hard drives, broken printers, lost or corrupted files, incompatible file formats, and similar mishaps are common issues when using technology, and are not acceptable grounds for a deadline extension.

VII INSTITUTIONAL POLICIES AND SUPPORT

ACADEMIC INTEGRITY

On Academic Integrity:

Academic integrity is essential to the pursuit of learning and scholarship in a university, and to ensuring that a degree from the University of Toronto is a strong signal of each student's individual academic achievement. As a result, the University treats cases of cheating and plagiarism very seriously. The University of Toronto's Code of Behaviour on Academic Matters

(<https://governingcouncil.utoronto.ca/secretariat/policies/code-behaviour-academic-matters-july-1-2019>) outlines the behaviours that constitute academic dishonesty and the processes for addressing academic offences. Potential offences include, but are not limited to:

In papers and assignments:

1. Using someone else's ideas or words without appropriate acknowledgement.
2. Submitting your own work in more than one course without the permission of the instructor.

3. Making up sources or facts.
4. Obtaining or providing unauthorized assistance on any assignment.

On tests and exams:

1. Using or possessing unauthorized aids.
2. Looking at someone else's answers during an exam or test.
3. Misrepresenting your identity.

In academic work:

1. Falsifying institutional documents or grades.
2. Falsifying or altering any documentation required by the University.

All suspected cases of academic dishonesty will be investigated following procedures outlined in the Code of Behaviour on Academic Matters. If you have questions or concerns about what constitutes appropriate academic behaviour or appropriate research and citation methods, you are expected to seek out additional information on academic integrity from your instructor or from other institutional resources (see <https://www.academicintegrity.utoronto.ca/>).

Use of Ouriginal "Normally, students will be required to submit their course essays and other submissions to Turnitin.com for a review of textual similarity and detection of possible plagiarism. In doing so, students will allow their essays to be included as source documents in the Turnitin.com reference database, where they will be used solely for the purpose of detecting plagiarism. The terms that apply to the University's use of the Turnitin.com service are described on the Turnitin.com web site".

ACCESSIBILITY NEEDS

Students with diverse learning styles and needs are welcome in this course. The University of Toronto is committed to accessibility: if you require accommodations for a disability, or have any other accessibility concerns about the course, please contact [Accessibility Services](#) as soon as possible.

ADDITIONAL SERVICES and SUPPORT

The following are some important links to help you with academic and/or technical service and support

- General student services and resources at [Student Life](#)
- Full library service through [University of Toronto Libraries](#)
- Resources on conducting online research through [University Libraries Research](#)
- Resources on academic support from the [Academic Success Centre](#)
- Learner support at the [Writing Centre](#)
- Information for [Technical Support/Quercus Support](#)