

## ARE 6695: Global Energy Transitions

**Schedule:** MW 9:30-10:45pm

**Location:** RHBA 101

**Instructor:** Erik Katovich

**Office:** Young 303 A

**Email:** [erik.katovich@uconn.edu](mailto:erik.katovich@uconn.edu)

**Office Hours:** by Appointment

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**Course Description:** In this course, students will engage with recent theoretical and empirical research on the economics of clean energy transitions from a global perspective. Topics include fossil fuel extraction, critical minerals and metals, renewable and green technologies, and electricity generation, transmission, and consumption. Cross-cutting themes include energy poverty and development, industrial and climate policies, environmental impacts, and political economy.

**Student Learning Objectives:** By the end of the semester, students will be able to:

- participate in current economic and policy debates related to energy transitions
- evaluate and critique peer-reviewed literature
- develop original research ideas related to the topics in the course
- present their original research
- give feedback to other students on original research ideas related to topics in the course

**Course Website:** The Husky CT site will contain reading assignments, class schedule and due dates.

**Course Materials:** Weekly readings are listed in the course outline below, along with links to each reading. Students can access papers online through the UConn library system.

**Participation:** Students are expected to read all assigned materials **prior** to each class, actively participate in class discussions, and complete assignments.

At the beginning of the semester, students will sign up to lead the discussion of papers covered in specific classes. This will *not* involve detailed presentations summarizing the papers (since all students should have read them already), but *will* involve a few slides highlighting key findings, contributions, methodological innovations, critiques, and questions related to each paper.

**Project:** PhD students will write an original research paper related to topics covered in the course. This project may be the same as in another course, provided this is approved by both instructors. Students will develop this project over the course of the semester in line with the following milestones:

- **October 20<sup>th</sup>:** Submit a preliminary proposal outlining the research question, motivation, potential identification strategies and data sources, foreseeable challenges, and three key references in the literature. Students will schedule a meeting with the instructor to discuss this preliminary proposal during October.
- **November:** Schedule a second meeting with the instructor to discuss progress on the project and troubleshoot any challenges.
- **Early December:** Present research project during class to receive feedback from peers.
- **December 14<sup>th</sup>:** Submit final paper. Ideally, PhD students will continue pursuing this project as part of their dissertation research. It is therefore expected and acceptable that the end of semester submission remains a “work in progress.” Nevertheless, the draft should be well-organized and formatted as if it were a final draft.

Masters students may elect to develop a research proposal following the timeline outlined above. Alternatively, they may elect to develop a case study, in consultation with the instructor, on (1) the

energy transition path of a specific country, or (ii) a specific energy transition policy, including careful discussion of the economic and policy challenges involved in this case. Milestones for the case study are the same as those outlined above for the research proposal.

#### **Grading (Ph.D. students):**

- Participation in class discussions as a discussion leader: 20%
- Participation in class discussions as an audience member: 20%
- Preliminary research proposal: 10%
- Presentation of research project: 20%
- Final written research paper: 30%

#### **Grading (MS students):**

- Participation in class discussions as a discussion leader: 20%
- Participation in class discussions as an audience member: 20%
- Preliminary research proposal or case study: 10%
- Presentation of research project/case study: 20%
- Final written research paper/case study: 30%

Grades will be based on the following scale:

|     |          |     |          |
|-----|----------|-----|----------|
| A   | 94 – 100 | C   | 74 – 76  |
| A - | 90 – 93  | C - | 70 – 73  |
| B + | 87 – 89  | D + | 67 – 69  |
| B   | 84 – 86  | D   | 64 – 66  |
| B - | 80 – 83  | D - | 63 – 60  |
| C + | 77 – 79  | F   | below 60 |

The following grade points per credit shall be assigned to grades: A, 4.0; A-, 3.7; B+, 3.3; B, 3.0; B-, 2.7; C+, 2.3; C, 2.0; C-, 1.7; D+, 1.3; D, 1.0; D-, 0.7; F, 0.

#### **Late Policy**

You are expected to submit all your work by the specified deadlines. I will accept late submissions without penalty if requests for extensions are received in advance of due dates and stated reasons for the requests are reasonable and deemed acceptable.

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## **Course Outline:**

### **Week 1: Energy Transitions: Stylized Facts and the Historical Transition to Fossil Fuels**

#### **Monday, August 26<sup>th</sup>:**

- The Economist, The Exponential Growth of Solar Power Will Change the World (2024). [Link](#).

#### **Wednesday, August 28<sup>th</sup>:**

- Alan Fernihough, Kevin Hjortshøj O'Rourke, Coal and the European Industrial Revolution, The Economic Journal, Volume 131, Issue 635 (2021). <https://doi.org/10.1093/ej/ueaa117>
- Karen Clay, Joshua Lewis, and Edson Severnini, Canary in a Coal Mine: Infant Mortality and Tradeoffs Associated with Mid-20th Century Air Pollution. The Review of Economics and Statistics, Vol. 106 (3) (2024). [https://doi.org/10.1162/rest\\_a\\_01218](https://doi.org/10.1162/rest_a_01218)

## **Week 2: Oil and Gas Production**

**Monday, September 2<sup>nd</sup> – No Class (Labor Day)**

**Wednesday, September 4<sup>th</sup>:**

- Soren T. Anderson, Ryan Kellogg, and Stephen W. Salant, Hotelling Under Pressure, *Journal of Political Economy*, Volume 126, Number 3 (2018). <https://doi.org/10.1086/697203>
- David Mihalyi, Thomas Scurfield, How Africa's Prospective Petroleum Producers Fell Victim to the Resource Curse, *The Extractive Industries and Society*, Volume 8, Issue 1 (2021). <https://doi.org/10.1016/j.exis.2020.11.003>

## **Week 3: Development Impacts of Oil and Gas and the Shale Revolution**

**Monday, September 9<sup>th</sup>:**

- Gerhard Toews and Pierre-Louis Vézina, Resource Discoveries, FDI Bonanzas, and Local Multipliers: Evidence from Mozambique, *The Review of Economics and Statistics*, Vol. 104, No. 5 (2022). [https://doi.org/10.1162/rest\\_a\\_00999](https://doi.org/10.1162/rest_a_00999)
- Jonah Rexer, Corruption as a local advantage: Evidence from the indigenization of Nigerian Oil, *American Economic Review* (conditionally accepted) (2024). [Link](#).

**Wednesday, September 11<sup>th</sup>:**

- Feyrer, James, Erin T. Mansur, and Bruce Sacerdote, Geographic Dispersion of Economic Shocks: Evidence from the Fracking Revolution, *American Economic Review*, 107 (4) (2017). <https://doi.org/10.1257/aer.20151326>
- Nathan Balke, Xin Jin, and Mine Yücel, The Shale Revolution and the Dynamics of the Oil Market, *The Economic Journal* (2024). <https://doi.org/10.1093/ej/ueae013>

## **Week 4: Transitioning Away from Fossil Fuels**

**Monday, September 16<sup>th</sup>:**

- Lassi Ahlvik, Jørgen Juel Andersen, Jonas Hveding Hamang, and Torfinn Harding, Quantifying Supply-Side Climate Policies, Working Paper (2024). [Link](#).
- Renaud Coulomb, Fanny Henriet, Léo Reitzmann, 'Bad' Oil, 'Worse' Oil and Carbon Misallocation, Working Paper (2024). [Link](#).

**Wednesday, September 18<sup>th</sup>:**

- Jocelyn Timperley, The Fight to End Fossil Fuel Subsidies, *Nature* 598, 403-405 (2021). [Link](#).
- Frederick van der Ploeg and Armon Rezai, Stranded Assets in the Transition to a Carbon-Free Economy, *Annual Review of Resource Economics*, Volume 12 (2020). <https://doi.org/10.1146/annurev-resource-110519-040938>

## **Week 5: Critical Minerals, Supply Chains, and Industrial Policies**

**Monday, September 23<sup>rd</sup>:**

- Dominic Parker and Bryan Vadheim, Resource Cursed or Policy Cursed? US Regulation of Conflict Minerals and Violence in the Congo. *Journal of the Association of Environmental and Resource Economists* 4(1) (2017). <https://doi.org/10.1086/689865>
- Steven Poelhekke, Maarten Bosker, Paul Pelzl, and Else-Marie van den Herik, Restricting raw material exports, Working Paper (2024). [Link coming soon](#).

**Wednesday, September 25<sup>th</sup>:**

- Ann Harrison, Leslie A. Martin, and Shanthi Nataraj, Green Industrial Policy in Emerging Markets, Annual Review of Resource Economics, Volume 9 (2017). <https://doi.org/10.1146/annurev-resource-100516-053445>
- Florian Münch and Fabian Scheifele, Nurturing national champions? Local content in solar auctions and firm innovation. Energy Policy, Vol. 179 (113574) (2023). <https://doi.org/10.1016/j.enpol.2023.113574>

## **Week 6: Electricity Generation from Wind and Solar**

### **Monday, September 30<sup>th</sup>:**

- Stefan Ambec and Claude Crampes, Decarbonizing Electricity Generation with Intermittent Sources of Energy, Journal of the Association of Environmental and Resource Economists, Vol. 6, No. 6 (2019) <https://doi.org/10.1086/705536>
- Gaurav Doshi and Sarah Johnston, Market Structure and Technology Adoption in Renewable Energy, Working Paper (2024). [Link](#).

### **Wednesday, October 2<sup>nd</sup>:**

- Claire Petersen, Mar Reguant, Lola Segura, Measuring the Impact of Wind Power and Intermittency, Energy Economics, Volume 129, (2024). <https://doi.org/10.1016/j.eneco.2023.107200>
- Duncan S. Callaway, Meredith Fowlie, and Gavin McCormick. Location, Location, Location: The Variable Value of Renewable Energy and Demand-Side Efficiency Resources, Journal of the Association of Environmental and Resource Economists, Vol. 5, No. 1 (2018). <https://doi.org/10.1086/694179>

## **Week 7: Broader Impacts of Renewable Energy Sources**

### **Monday, October 7<sup>th</sup>:**

- Claudia Serra-Sala, Blowing in the Wind: Revenue Windfalls and Local Responses from Wind Farm Development, Working Paper (2024). [Link](#).
- Nathaly Rivera, J. Cristobal Ruiz-Tagle, and Elisheba Spiller, The health benefits of solar power generation: Evidence from Chile, Journal of Environmental Economics and Management, Vol. 126 (2024). <https://doi.org/10.1016/j.jeem.2024.102999>

### **Wednesday, October 9<sup>th</sup>:**

- Lipscomb, Molly, A. Mushfiq Mobarak, and Tania Barham. Development Effects of Electrification: Evidence from the Topographic Placement of Hydropower Plants in Brazil. American Economic Journal: Applied Economics, Vol. 5, No. 2 (2013). <http://dx.doi.org/10.1257/app.5.2.200>
- Stephen Jarvis, Olivier Deschenes, and Akshaya Jha, The Private and External Costs of Germany's Nuclear Phase-Out, Journal of the European Economic Association, Volume 20, Issue 3 (2022). <https://doi.org/10.1093/jeea/jvac007>

## **Week 8: Electricity Transmission and Grid Management**

### **Monday, October 14<sup>th</sup>:**

- Fell, Harrison, Daniel T. Kaffine, and Kevin Novan. Emissions, Transmission, and the Environmental Value of Renewable Energy. American Economic Journal: Economic Policy, 13 (2) (2021). <https://doi.org/10.1257/pol.20190258>

- Luis E. Gonzales, Koichiro Ito, Mar Reguant, The Investment Effects of Market Integration: Evidence From Renewable Energy Expansion in Chile, *Econometrica*, Volume 91, Issue 5 (2023). <https://doi.org/10.3982/ECTA20769>

#### **Wednesday, October 16<sup>th</sup>:**

- Achyuta Adhvaryu, Teresa Molina, Anant Nyshadham, Jorge Tamayo, Nicolas Torres, The health costs of dirty energy: Evidence from the capacity market in Colombia, *Journal of Development Economics*, Vol. 164 (2023). <https://doi.org/10.1016/j.jdeveco.2023.103116>
- Meera Mahadevan, The Price of Power: Costs of Political Corruption in Indian Electricity, Accepted at the *American Economic Review* (2024). [Link](#).

### **Week 9: Electricity Consumption I: Households**

#### **Monday, October 21<sup>st</sup>:**

- Lee, Kenneth, Edward Miguel, and Catherine Wolfram. Appliance Ownership and Aspirations among Electric Grid and Home Solar Households in Rural Kenya. *American Economic Review*, 106 (5) (2016). <http://dx.doi.org/10.1257/aer.p20161097>
- Lucas Davis, Paul Gertler, Stephen Jarvis, Catherine Wolfram, Air conditioning and global inequality, *Global Environmental Change*, Vol. 69 (2021). <https://doi.org/10.1016/j.gloenvcha.2021.102299>

#### **Wednesday, October 23<sup>rd</sup>:**

- Jacint Enrich, Ruoyi Li, Alejandro Mizrahi, Mar Reguant, Measuring the impact of time-of-use pricing on electricity consumption: Evidence from Spain, *Journal of Environmental Economics and Management*, Vol. 123 (2024). <https://doi.org/10.1016/j.jeem.2023.102901>
- Michael Grimm, Luciane Lenz, Jörg Peters, and Maximiliane Sievert, Demand for Off-Grid Solar Electricity: Experimental Evidence from Rwanda, *Journal of the Association of Environmental and Resource Economists*, Vol. 7, No. 3 (2020). <https://doi.org/10.1086/707384>

### **Week 10: Electricity Consumption II: Industry and Transportation**

#### **Monday, October 28<sup>th</sup>:**

- Matthew A. Cole, Robert J.R. Elliott, Giovanni Occhiali, Eric Strobl, Power outages and firm performance in Sub-Saharan Africa, *Journal of Development Economics*, Vol. 134 (2018). <https://doi.org/10.1016/j.jdeveco.2018.05.003>
- Massimiliano Cali, Nicola Cantore, Leonardo Iacovone, Mariana Pereira-López, Giorgio Presidente. Too Much Energy: The Perverse Effect of Low Fuel Prices on Firms, *Journal of Environmental Economics and Management*, Vol. 111 (2022). <https://doi.org/10.1016/j.jeem.2021.102587>

#### **Wednesday, October 30<sup>th</sup>:**

- Shanjun Li, Xianglei Zhu, Yiding Ma, Fan Zhang, Hui Zhou, The Role of Government in the Market for Electric Vehicles: Evidence from China, *Journal of Policy Analysis and Management*, Volume 41, Issue 2 (2022). <https://doi.org/10.1002/pam.22362>
- Askill H Halse, Karen Hauge, Elisabeth T Isaksen, Bjørn G Johansen, and Oddbjørn Raaum, Local Incentives and Electric Vehicle Adoption, *Journal of the Association of Environmental and Resource Economists* (2024). <https://doi.org/10.1086/730590>

### **Week 11: Energy Poverty and Development**

#### **Monday, November 4<sup>th</sup>:**

- Fiona Burlig and Louis Preonas, Out of the Darkness and into the Light? Development Effects of Rural Electrification, *Journal of Political Economy* (forthcoming) (2024). <https://doi.org/10.1086/730204>
- Justice Tei Mensah, Jobs! Electricity shortages and unemployment in Africa, *Journal of Development Economics*, Vol. 167 (2024). <https://doi.org/10.1016/j.jdeveco.2023.103231>

#### **Wednesday, November 6<sup>th</sup>:**

- Anjali Verma and Imelda, Clean Energy Access: Gender Disparity, Health and Labour Supply, *The Economic Journal*, Volume 133, Issue 650 (2023). <https://doi.org/10.1093/ej/ueac057>
- Arthur A. van Benthem, Energy Leapfrogging, *Journal of the Association of Environmental and Resource Economists*, Volume 2, Number 1 (2015). <https://doi.org/10.1086/680317>

### **Week 12: Energy Transitions: Jobs and Skills**

#### **Monday, November 11<sup>th</sup>:**

- Mark Curtis, Layla O’Kane, and Jisung Park, Workers and the Green-Energy Transition: Evidence from 300 million Job Transitions, *Environmental and Energy Policy and the Economy*, Vol. 5 (2024). <https://doi.org/10.1086/727880>
- Aline Bütikofer, Antonio Dalla-Zuanna, and Kjell G. Salvanes, Natural Resources, Demand for Skills, and Schooling Choices, IZA Working Paper No. 16286 (2023). [Link](#).

#### **Wednesday, November 13<sup>th</sup>:**

- Gordon Hanson, Local Labor Market Impacts of the Energy Transition: Prospects and Policies, NBER Working Paper No. 30871 (2023). [Link](#).
- Juan Pablo Rud, Gerhard Toews, Michael Simmons, and Fernando Aragon, Job Displacement Costs of Phasing Out Coal, *Journal of Public Economics* (2024). [Link](#).

### **Week 13: Climate Policies and Geopolitics**

#### **Monday, November 18<sup>th</sup>:**

- Jonathan Colmer, Ralf Martin, Mirabelle Muûls, and Ulrich J Wagner, Does Pricing Carbon Mitigate Climate Change? Firm-Level Evidence from the European Union Emissions Trading System, *The Review of Economic Studies* (2024). <https://doi.org/10.1093/restud/rdae055>
- Clausing, Kimberly A., and Catherine Wolfram. Carbon Border Adjustments, Climate Clubs, and Subsidy Races When Climate Policies Vary. *Journal of Economic Perspectives*, 37 (3) (2023). <https://doi.org/10.1257/jep.37.3.137>

#### **Wednesday, November 20<sup>th</sup>:**

- John Bistline, Neil Mehrotra, and Catherine Wolfram, Economic Implications of the Climate Provisions of the Inflation Reduction Act, *Brookings Papers on Economic Activity* (2024). [Link](#).
- Meghan L. O’Sullivan & Jason Bordoff, Green Peace: How the Fight against Climate Change Can Overcome Geopolitical Discord, *Foreign Affairs*, Vol. 103, No. 62 (2024). [Link](#).

### **Thanksgiving Break**

### **Week 14: In-Class Presentations**

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**Policy Against Discrimination, Harassment and Related Interpersonal Violence:**

The University is committed to maintaining an environment free of discrimination or discriminatory harassment directed toward any person or group within its community – students, employees, or visitors. Academic and professional excellence can flourish only when each member of our community is assured an atmosphere of mutual respect. All members of the University community are responsible for the maintenance of an academic and work environment in which people are free to learn and work without fear of discrimination or discriminatory harassment. In addition, inappropriate amorous relationships can undermine the University's mission when those in positions of authority abuse or appear to abuse their authority. To that end, and in accordance with federal and state law, the University prohibits discrimination and discriminatory harassment, as well as inappropriate amorous relationships, and such behavior will be met with appropriate disciplinary action, up to and including dismissal from the University. Additionally, to protect the campus community, all non-confidential University employees (including faculty) are required to report sexual assaults, intimate partner violence, and/or stalking involving a student that they witness or are told about to the Office of Institutional Equity (OIE). Please be aware that while the information you provide will remain private, it will not be confidential and will be shared with University officials who can help.

An exception to this reporting exists if students disclose information as a part of coursework submitted to an instructor in connection with a course assignment. Even in the absence of such obligation, all Employees are encouraged to contact OIE if they become aware of information that suggests a safety risk to the University community or any member thereof. The University takes all reports with the utmost seriousness. More information, including resources and reporting options, is available at [equity.uconn.edu](http://equity.uconn.edu) and [titleix.uconn.edu](http://titleix.uconn.edu).

**Students with disabilities:** The University of Connecticut is committed to protecting the rights of individuals with disabilities and assuring that the learning environment is accessible. If you anticipate or experience physical or academic barriers based on disability or pregnancy, please let me know immediately so that we can discuss options. Students who require accommodations should contact the Center for Students with Disabilities, Wilbur Cross Building Room 204, (860) 486-2020 or <http://csd.uconn.edu/>.

**Academic Integrity:** This course expects all students to act in accordance with the Guidelines for Academic Integrity at the University of Connecticut. Because questions of intellectual property are important to the field of this course, we will discuss academic honesty as a topic and not just a policy. If you have questions about academic integrity or intellectual property, you should consult with your instructor. Additionally, consult UConn's [guidelines for academic integrity](#).

**Resources for Students Experiencing Distress**

The University of Connecticut is committed to supporting students in their mental health, their psychological and social well-being, and their connection to their academic experience and overall wellness. The university believes that academic, personal, and professional development can flourish only when each member of our community is assured equitable access to mental health services. The university aims to make access to mental health attainable while fostering a community reflecting equity and diversity and understands that good mental health may lead to personal and professional growth, greater self-awareness, increased social engagement, enhanced academic success, and campus and community involvement.

Students who feel they may benefit from speaking with a mental health professional can find support and resources through the Student Health and Wellness-Mental Health (SHaW-MH) office. Through SHaW-MH, students can make an appointment with a mental health professional and engage in confidential conversations or seek recommendations or referrals for any mental health or psychological concern.

Mental health services are included as part of the university's student health insurance plan and also partially funded through university fees. If you do not have UConn's student health insurance plan, most major insurance plans are also accepted. Students can visit the Student Health and Wellness-

Mental Health located in Storrs on the main campus in the Arjona Building, 4th Floor, or contact the office at (860) 486-4705, or <https://studenthealth.uconn.edu/> for services or questions.

**Accommodations for Illness or Extended Absences**

If illness prevents you from participating in class, it is your responsibility to notify me as soon as possible. If life circumstances are affecting your ability to focus on courses and your UConn experience, students can email the Dean of Students at [dos@uconn.edu](mailto:dos@uconn.edu) to request support.

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