



## **PPHA 36922: Energy in the Developing World**

### **Instructor**

Anant Sudarshan, TBD

### **Guest Lecturer**

Kalikesh Deo, TBD

Office Hours: TBD

### **Abstract**

In 1879, the year Thomas Edison invented the light bulb, about 1.2 billion people lived on the planet (The Maddison Project, 2013). Today, 140 years later, over a billion people still live without electricity. There is a clear relationship between the national income of countries across the globe and their energy consumption. But is the pervasive energy poverty of poor countries a cause or a consequence of low incomes? And if the former, what are the costs of our failure to bring modern energy to the poor? As developing countries allocate scarce resources towards competing policy imperatives, it becomes critical to answer these questions.

Providing modern energy to the poor has proved to be a remarkably thorny problem. There is widespread political and policy support for bringing electricity to the poor. More recently there has been a surge in private capital with entrepreneurs seeking to reduce energy poverty via decentralized renewable electricity sources. And yet developing country institutions have failed to achieve their goals, with hundreds of millions of people disconnected from the grid, and even more households forced to make do with intermittent and unreliable power. Why is this the case?

This course explores the complex policy landscape lying at the intersection of energy and development concerns. We will review recent research and carry out in-depth discussions with Kalikesh Deo, an elected Member of India's Parliament, and a member of several house committees in India dealing with energy and climate change. Readings and project work will assume prior exposure to micro-economics at least at a senior undergraduate level. Comfort with quantitative analysis techniques such as regression modeling is also highly recommended.



## Course Goals or Objectives

A vibrant and growing literature is using new methods and innovative sources of data to help us understand different problems at the intersection of energy and development concerns. Students will gain a broad familiarity with important examples of this work and learn how to critically consume these types of analysis. We will also seek to understand how academic work interacts (or does not interact) with policy-making and how political economy considerations influence state decision-making on environmental policy. Students will leave the course with an understanding of how to use existing research to produce informed policy recommendations.

Lastly, the goal of this class is to be an intellectually invigorating experience. We will talk about problems that are critically important but at best only partially understood and resolved. Our goal will be to understand counter-intuitive aspects of the challenge of removing energy poverty. As a highly participatory class, the more you bring to the course, the more you will take away.

## Major Assignments

1. Participation is essential to getting the most out of this class. This includes active discussion of the research we cover, as well as during our scheduled policy discussions.
2. We will normally cover either one or two readings for every class. At the start of each class students must submit a **one-page** note outlining (i) the most important things you took away from the reading and (ii) two questions that you believe are worth discussing in class. You will be graded based only on timely submissions. A maximum of two missed assignments are allowed.
3. There will be one data assignment to be completed. This will require you to carry out an analysis of “real-world” dataset using STATA or R. You will need to submit outputs as well as source code for your answers.
4. There will be one short 2-page policy memo to be completed.
5. There will be one take-home final exam covering material that we have discussed in class and some (quick) online research and data work.



## Grading Standards and criteria

Assignments will contribute to your grades as follows:

Paper Summaries: 30 percent

Data Assignment: 20 percent

Policy Memo: 20 percent

Final Exam: 30 percent

## ADA student accommodations

Any student who believes they may need assistance should inform the Office of Student Disability Services by the end of the first week of class. Once you have received an accommodation letter, it should be presented to the course instructor immediately."

<https://disabilities.uchicago.edu/>

## Class Readings

(Subject to revisions)

<i>April 01</i>	Detchon, R. & Van Leeuwen, R. "Bring sustainable energy to the developing world". <i>Nature</i> 507, 154-156 (2014). Barnes, Douglas and Floor, Willem. 1996. <i>Rural Energy in Developing Countries: A Challenge for Economic Development</i> . <i>Annual Review of Energy and the Environment</i> . Vol. 21:497-530
<i>April 03</i>	Econometrics Refresher (Slides Only) Min, Brian, and Kwawu Mensan Gaba. 2014. "Tracking Electrification in Vietnam Using Nighttime Lights." <i>Remote Sensing</i> 6 (10): 9511-9529.
<i>April 08</i>	Dinkelman, Taryn. 2011. "The effects of rural electrification on employment: New evidence from South Africa". <i>American Economic Review</i> . Vol. 101(7) pages 3078-3108 M. Lipscomb, A. M. Mobarak, T. Barham. " <a href="#">Development Effects of Electrification: Evidence from the Topographic Placement of Hydropower Plants in Brazil</a> ," <i>American Economic Journal: Applied Economics</i> , 5(2): 200-231, April 2013



<i>April 10</i>	Burlig, Fiona and Louis Preonas. 2018. "Out of Darkness and Into the Light." Mimeo. "Electricity does not change poor lives as much as was thought". The Economist. Feb 07, 2019.
<i>April 15</i>	Lee, Kenneth, Edward Miguel, and Catherine Wolfram. 2016b. "Experimental Evidence on the Demand for and Costs of Rural Electrification". Mimeo. Lee, Kenneth, Eric Brewer, Carson Christiano, Francis Meyo, Edward Miguel, Matthew Podolsky, Javier Rosa, and Catherine Wolfram. 2016. "Electrification for "Under Grid" Households in Rural Kenya." Development Engineering 1: 26-35.
<i>April 17</i>	Burgess, R., Greenstone, M., Ryan, N. and Anant Sudarshan. 2019. The Demand for Off-grid Solar Power: Evidence from Rural India's Surprisingly Competitive Retail Power Market Tollefson, Jeff. "Islands of Light". Nature 508, 309-311 (2014).
<i>April 22</i>	T. Baskaran, B. Min, Uppal Y. 2015. "Election cycles and electricity provision: Evidence from a quasi-experiment with Indian special elections". Journal of Public Economics, 126 (2015), pp. 64-73
<i>April 24</i>	Kalikesh Deo: The Politics of Ensuring Electricity Access Movie: Aayee, Gayee
<i>April 29</i>	Paying for power (slides only) Kalikesh Deo: Distribution Reform in India Sustainable Energy without the Hot Air
<i>May 01</i>	Chakravarty and Tavoni. 2013. Energy poverty alleviation and climate change mitigation: is there a trade off? Energy Econ., 40 (2013), pp. S67-S73 Kalikesh Deo: Can the developing world move to renewables? A Green New Deal?



Subramaniam, Meera. 2014. "Deadly Dinners". *Nature* Vol. 509. pp. 548-551.

May 06 Hanna, Rema, and Paulina Oliva. 2015. "Moving Up the Energy Ladder: The Effect of an Increase in Economic Well-Being on the Fuel Consumption Choices of the Poor in India." *American Economic Review*, 105 (5): 242-46.

S. Pachauri, N.D. Rao. 2013. Gender impacts and determinants of energy poverty: Are we asking the right questions? *Curr. Opin. Environ. Sustain.*, 5 (2) pp. 205-215

May 08 Hanna, Rema, Esther Duflo, and Michael Greenstone. 2016. "Up in Smoke: The Influence of Household Behavior on the Long-Run Impact of Improved Cooking Stoves." *American Economic Journal: Economic Policy*, 8 (1): 80-114.

May 13 McRae, Shaun. 2015. "Infrastructure Quality and the Subsidy Trap." *American Economic Review* 105(1): 35-66

May 15 Ryan, Nicholas. 2014. "Contract Enforcement and Productive Efficiency: Evidence from the bidding and renegotiation of power contracts in India". Mimeograph.

May 20 Jaffe, Adam B, and Robert N Stavins. 1994. "The energy-efficiency gap: What does it mean?" *Energy policy*, 22(10): 804-810.

Wolfram, Catherine, Ori Shelef, and Paul Gertler. 2012. "How Will Energy Demand Develop in the Developing World?" *Journal of Economic Perspectives*, 26 (1): 119-38.

May 22 Badiani, R., Jessoe, K. K., & Plant, S. (2012). Development and the Environment: The Implications of Agricultural Electricity Subsidies in India. *The Journal of Environment & Development*, 21(2), 244-262.

The Efficiency of Rationing: Agricultural Power Subsidies, Power Supply and Groundwater Depletion in Rajasthan (slides only)

Replacing tariff subsidies with unconditional transfers (slides only)

May 27 Barnwal, Prabhat. 2018. "Curbing Leakage in Public Programs: Evidence from India's Direct Benefit Transfer Policy." Mimeo.

N. Rao. 2012. Kerosene subsidies in India: when energy policy fails as social policy *Energy Sustain. Dev.* 16 (1) pp. 35-43.

May 29 Jack, B. Kelsey, and Grant Smith. 2016. "Charging ahead: Prepaid electricity metering in South Africa" Mimeo.



*June 3*

Ebenstein, A., Maoyong Fan, Michael Greenstone, Guojun He, and Maigeng Zhou. 2017. "New evidence on the impact of sustained exposure to air pollution on life expectancy from China's Huai River Policy". *Proceedings of the National Academy of Sciences*. 114 (39): 10384–10389

*June 5*