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Course Developer and Instructor: Shanti Gamper-Rabindran
Ph.D. (Economics) MIT, M.Sc. (Environmental Management) Oxford
Associate Professor, Graduate School of Public and International Affairs,
And Department of Economics
University of Pittsburgh
www.shanti1.weebly.com

PIA 2522 GLOBAL ENERGY POLICY
Fall 2013

This course applies concepts and tools from economics, political science and risk analysis to address global energy issues, while cognizant of the state of the science and uncertainties. First, we examine various energy sources in the US/EU/developing countries including oil, gas, nuclear, hydro, biofuels, solar and wind. Specifically, we explore methods to estimate the benefits and costs/risks (economic, environmental, health, political) from various energy sources. We discuss how market forces, market failures, lobbying, and government policies influence the gaps between private and social costs of energy. Second, we examine incentive policies for the adoption of renewable energy (e.g., carbon pricing, cap & trade, renewable portfolio standards, pull-push innovation policies), barriers to their adoption (infrastructure, storage, and intermittency), and overall benefits from restructuring towards a greener economy. Third, we address incentive policies to increase energy efficiency (e.g., fuel economy standards, rebates, LEED certification). Fourth, we examine the role of international trade, investment, technology transfer and climate policy in increasing energy efficiency and renewable energy worldwide. Fifth, we examine the geopolitics of energy sources (e.g. US, EU/Russia, China/Africa, Central Asia & Middle East). We discuss the growing recognition that investment in energy efficiency and renewable energy can mitigate national security concerns stemming from fossil fuel dependency.

At the end of this course, students should be able to:

- Write policy memos with solid arguments and analysis, backed by empirical evidence
- Articulate the benefits and costs/risks of different energy sources
- Describe how policy tools can internalize external costs of energy (e.g. environmental, health or security costs).
- Describe how policy tools can incentivize shifts towards greater energy efficiency and energy sources with lower environmental footprint.

Please mark your calendars for the conference I am organizing at Pitt on “Energy and Environment: Comparative EU and US Policies” March 21 and 22, 2014.

I have developed and taught two companion courses to my Global Energy course:
PIA 2522 Global Environment Policy (Spring 2014) addresses environmental issues in depth.
PIA 2553 Global Health Policy (Spring 2014) addresses health issues in depth.

Week 1. Energy – Economy – Environment – Climate - Politics

Section 1: Overview

Yergin. How Is Energy Remaking the World? Foreign Policy. July/August 2012 issue

Section 2: Energy Statistics

EIA. Annual Energy Outlook. Executive Summary

EIA, Energy Statistics

Section 3: Energy –Environment Nexus

Keith Schneider. Circle of Blue. In Era of Climate Change and Water Scarcity, Meeting National Energy Demand Confronts Major Impediments

James E. McMahon and Sarah K. Price (2011), Water and Energy Interactions, Environment and Resources Vol. 36: 163–191

Nathan Pelletier, Eric Audsley, Sonja Brodt, Tara Garnett, Patrik Henriksson, Alissa Kendall, Klaas Jan Kramer, David Murphy, Thomas Nemecek, and Max Troell (2011), Energy Intensity of Agriculture and Food Systems, Environment and Resources, Vol. 36: 223–246

Week 2: Policy Memos and Review of Basic Economic Concepts

See powerpoints and sample memos on courseweb

Concepts: Public Goods, Externality, Principal-Agent, Coordination, Regulatory Capture, Monopoly, Monopsony, Time Inconsistencies

Week 3: Nuclear Energy Part I

Section 1: Nuclear Overview

M.V. Ramana, 2009. Nuclear Power: Economic, Safety, Health, and Environmental Issues of Near-Term Technologies. *Annual Review of Environmental Resources*, 34, p.127-152

Paul Slovic, Baruch Fischhoff, Sarah Lichtenstein, "Perceived Risk" in R. C. Schwing and W. A. Albers, Jr. (Eds.), *Societal Risk Assessment: How Safe is Safe Enough?* New York: Plenum, Press, 1980.

Section 2: Nuclear Waste

Eugene A. Rosa et al., 2010. Nuclear Waste: Knowledge Waste? *Science*, 329, p.762-763

Department of Energy 2013 “Strategy for the Management and Disposal of Used Nuclear Fuel and High-Level Radioactive Waste”

Section 3: Prospects for Nuclear Energy post-Fukushima

Lucas W. Davis. 2011. Prospects for U.S. Nuclear Power After Fukushima. Energy Institute at Haas UC Berkeley Working Paper

Joskow, Paul L.; Parsons, John E. The Future of Nuclear Power After Fukushima MIT CEEPR, 2012-02

Week 4: Nuclear Energy Part 2

Section 4: France – Dependence on Nuclear

Movie “Déchets - Le Cauchemar du Nucléaire” 2009

“French nuclear firm accused of dumping of nuclear waste in Russia, prompting Parliamentary inquiry in France. The message that AREVA's "recycling" ratio had to be corrected from 95% to less than 10% of the original mass send a shockwave through the French political landscape.”

Section 5: Germany – Moving Away from Nuclear Energy

Paul Hackenos, (2012) Why Germans are so skeptical about nuclear energy, World Policy.org

M Fürsch, et al. (2012) German nuclear policy reconsidered: Implications for the electricity market, Institute of Energy Economics. Working Paper, University of Cologne working paper

Section 6: Nuclear Accidents: Fukushima, Chernobyl, Three Mile Island

James M. Acton and Mark Hibbs, Why Fukushima was Preventable, March 2012, Carnegie Papers, Carnegie Endowment for International Peace

lochbaum, D. (2011), “The NRC and Nuclear Power Plant Safety in 2010”

Union of Concerned Scientists Report. 2010. A Brighter Spotlight Needed

http://www.ucsusa.org/nuclear_power/nuclear_power_risk/safety/nrc-and-nuclear-power-2010.html

Week 5: Fossil Fuel Part 1

Section 1: Estimating the military costs of fossil fuels use

Mark A. Delucchi and James J. Murphy, US military expenditures to protect the use of Persian Gulf oil for motor vehicles Volume 36, Issue 6, June 2008, Pages 2253–2264

Toby Craig Jones, America, Oil, and War in the Middle East, Journal of American History Special Issue volume 99 (2012)

Section 2: Estimating the costs of oil spills

Catherine L. Kling, Daniel J. Phaneuf, and Jinhua Zhao, “From Exxon to BP: Has Some Number Become Better than No Number?” The Journal of Economics Perspectives Volume 26 • Number 4 • Fall 2012

Jerry Hausman, “Contingent Valuation: From Dubious to Hopeless”, The Journal of Economics Perspectives Volume 26 • Number 4 • Fall 2012

Bernard D. Goldstein, Howard J. Osofsky and Maureen Y. Lichtveld, The Gulf Oil Spill, New England Journal of Medicine (April 7, 2011) v364 p1334-1348

Section 3: Economic and Regulatory responses to reduce the probability of another major oil spill

Resources for the Future (2011). Deepwater Drilling Key Recommendations

The National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling. Final Report. Executive Summary

Suggested Books

Journal of American History. Special Issue on Oil in American History volume 99 (2012)
Peter Maass, 2009. Crude World: The Violent Twilight Of Oil.
Ervand Abrahamian: The Coup: 1953, The CIA, and The Roots of Modern U.S.-Iranian Relations
William Freudenburg, Robert Gramling 2011. Blowout in the Gulf: The BP Oil Spill Disaster and the Future of Energy in America

Week 6: Fossil Fuels Part 2

Section 4: Holding Companies Accountable in Developed Countries for Actions in Developing Countries

Paul Collier. The Plundered Planet: Why We Must, and How We Can, Manage Nature for Global Prosperity (2010) Oxford University Press, Chapters on keeping firms and governments accountable for oil revenues and environmental impacts.
Center for Constitutional Rights. Wiwa et al v. Royal Dutch Petroleum et al (on Alien Tort Claims Act)

Section 5: Shale

(This topic is covered in greater detail in GSPIA's capstone course taught by Sabina Deitrick, Fall 2013)

Beresteanu and Gamper-Rabindran, Spatial analysis of Regulatory Activity in the Shale Gas Sector, work-in-progress

Radisav Vidic et. al. "Impact of Shale Gas Development on Regional Water Quality." Science May 2013 (6134): 340.

Week 7: Energy and Poverty

Section 1: Energy Poverty and Development

Lakshman Guruswamy (2011) Energy Poverty, Environment and Resources, Vol. 36: 139–161

Section 2: Micro-Solar, Micro-hydro and Social Entrepreneurship

Poor People's Energy Outlook. The 2012 report, 'Energy for earning a living',
<http://practicalaction.org/ppeo2012-report>
<http://www.barefootpower.com/>

Section 3: Large-Scale Hydro

Powerpoint :International Rivers Network and the Bujagali Dam Project

Powerpoint :Report of the World Commission on Dams

Gørild Heggelund, 2006. Resettlement Programmes and Environmental Capacity in the Three Gorges Dam Project. *Development and Change* 37(1), pp. 179–199

Mara Hvistendahl, 2008. China's Three Gorges Dam: An Environmental Catastrophe? Even The Chinese Government Suspects The Massive Dam May Cause Significant Environmental Damage. *Scientific American*.

Suggested Books

Sanjeev Khagram, 2004. *Dams and Development: Transnational Struggles for Water and Power*. Cornell University Press

Week 8: Renewable Energy 1

Section 1: Overview

EIA, Renewable Energy Figures

EIA, Renewable Energy Technology Resource Maps for the United States

What Economics Tell Us About Investment in Renewable Energy? (Powerpoint)

Section 2: The Military and Alternative Energy

Listen to podcast panel on July 5, 2011 Diane Rehm Show

Section 3: Price signal is the most important policy for adoption and innovation

N Johnstone, I Haščič, D Popp. Renewable energy policies and technological innovation:

Evidence based on patent counts. *Environmental and Resource Economics*, 2010 – Springer

Section 4: Technology Issues

CMU Scott Institute, Managing Variable Energy Resources to Increase Renewable Electricity's Contribution to the Grid, Policymakers Guide

Week 9; Renewable Energy Part 2

Section 5: Policies for Innovation

Henderson, Rebecca M., and Richard G. Newell. "Accelerating Energy Innovation: Insights from Multiple Sectors. University of Chicago Press, 2010. 1-23.

Michael Greenstone, 2010. The Importance of Research and Development (R&D) for U.S. Competitiveness and a Clean Energy Future. Brookings

Donald Kennedy, 2010. Getting Better to Get Bigger. *Science*, 329, pp.727-789

Section 6: Economic benefits from Renewables

Frondel, Manuel, et al. "Economic impacts from the promotion of renewable energy technologies: The German experience." *Energy Policy* 38.8 (2010): 4048-4056.

Section 7: Policies for Renewables Adoption

Menanteau, Philippe, Dominique Finon, and Marie-Laure Lamy. "Prices versus quantities: choosing policies for promoting the development of renewable energy." *Energy policy* 31.8 (2003): 799-812.

Ryan Wiser, Christopher Namovicz, Mark Gielecki, Robert Smith, The Experience with Renewable Portfolio Standards in the United States, *The Electricity Journal*, Volume 20, Issue 4, May 2007, Pages 8–20

Van Eynde, Sarah, and Pei-fei Chang. "Explaining the development of China's renewable energy policies: comparing wind and solar power." status: accepted (2013).

Week 10: Policy Instruments

Section 1: Carbon Markets/Emissions Trading

T Laing, M Sato, M Grubb, C Comberti (2013) Assessing the effectiveness of the EU Emissions Trading System. LSE Working Paper

Richard G. Newell, William A. Pizer and Daniel Raimi "Carbon Markets 15 Years after Kyoto: Lessons Learned, New Challenges," *Journal of Economic Perspectives*, 27 (Winter 2013)

Lawrence H. Goulder "Markets for Pollution Allowances: What Are the (New) Lessons?" *Journal of Economic Perspectives*, 27 (Winter 2013)

Section 2: Innovation Policies

Peter Ogden, John Podesta, John Deutsch, "A New Strategy to Spur Energy Innovation" *Issues in Science & Technology*, Winter 2008.

Week 11: International Diffusion of Green Technology

Section 1: International Diffusion of Green Technology

Dechezleprêtre, Antoine, Matthieu Glachant, and Yann Ménière. "What drives the international transfer of climate change mitigation technologies? Empirical evidence from patent data." *Environmental and resource economics* 54.2 (2013): 161-178.

Glachant, Matthieu, and M. I. N. E. S. ParisTech. "Greening Global Value Chains: Innovation and the International Diffusion of technologies and Knowledge." Annual Green Growth Knowledge Platform (GGKP) conference, Paris. 2013.

Section 2: Clean Development Mechanism

Boyd, E., N.E. Hultman, J.T. Roberts, E. Corbera, J. Cole, A. Bozmoski, J. Ebeling, R. Tippman, K. Brown, D.M. Liverman (2009). "Reforming the Clean Development Mechanism for Sustainable Development: Lessons learned and future prospects." *Environmental Science & Policy* 12(3): 820-831.

Week 12: Incentivizing Energy Efficiency

Section 1: Evaluation of Policies

Kenneth Gillingham, Richard Newell, and Karen Palmer, *Energy Efficiency Policies: A Retrospective Examination*, Annual Review of Environment and Resources, Vol. 31: 161-192 November 2006

Allcott, Hunt, and Michael Greenstone (2012). "Is There an Energy Efficiency Gap?" *Journal of Economic Perspectives*, Vol. 26: 3-28.

Section 2: Incentivizing Consumers

Allcott, H., and S. Mullainathan. 2009. Behavior and Energy Policy. *Science* 327(5970): 1204–1205.

Cass R. Sunstein (forthcoming). *Nudges.gov: Behavioral Economics and Regulation* Oxford Handbook of Behavioral Economics and the Law (Eyal Zamir and Doron Teichman eds.)

Week 13. Transportation

Section 1: Transportation Issues

Christopher Knittel Reducing Petroleum Consumption from Transportation, *Journal of Economic Perspectives* 26(1) 2012

Christopher Knittel 2013 Transportation Fuel Policies since OPEC Embargo: Paved with Good Intentions. *The American Economic Review, Papers & Proceedings* 103(3)

Section 2: Cases in China and US

Morrow, W. Ross, Kelly Sims Gallagher, Gustavo Collantes, and Henry Lee. "Analysis of Policies to Reduce Oil Consumption and Greenhouse-Gas Emissions from the US Transportation Sector." *Energy Policy* 38, no. 3 (March 2010): 1305-1320.

Shomik Mehndiratta and Andrew Salzberg. Improving Public Transport in Chinese Cities: Elements of an Action Plan. Chapter 11. *Sustainable Low Carbon City*

Week 14. Geopolitics Part 1

Section 1: Overview

Frank A. Verrastro, Sarah O. Ladislaw, Matthew Frank, Lisa Hyland (2010), *The Geopolitics of Energy: Emerging Trends, Changing Landscapes, Uncertain Times*. Center for Strategic and International Studies

Section 2: View from the Military

Center for Naval Analysis. 2009. *Powering America's Defense: Energy and the Risks to National Security*

Week 15. Geopolitics Part 2

Section 1: China in Africa

Henry Lee, Dan Shalmon, Robert I. Rotberg. "Searching for Oil: China's Oil Strategies in Africa." Chap. 6 in *China into Africa: Trade, Aid, and Influence*. Washington, D.C. and Cambridge, Mass.: Brookings Institution Press and World Peace Foundation, October 2008.

Denis M. Tull, 2006. China's Engagement In Africa: Scope, Significance And Consequences. *Journal of Modern African Studies*, 44(3), p.459-479

Section 2: Central Asia

Edward C. Chow and Leigh E. Hendrix. 2010. *Central Asia's Pipelines: Field of Dreams and Reality Energy and National Security Program*, Center for Strategic and International Studies (CSIS). *The National Bureau of Asian Research* #23

Suggested Books

Duncan Clarke, 2009. *Crude Continent: The Struggle For Africa's Oil Prize*.

Elizabeth Van Wie Davis, Rouben Azizian, Islam, Oil, and Geopolitics: Central Asia after September 11, 2006 Rowman & Littlefield Publishers