The Economics of Regulation and Deregulation in the Energy Industries

Vermont Law School Environmental Law Center Summer 2009
ABCs of Energy and the Environment
Syllabus, 1 June to 4 June 2009

Instructor

Seth Blumsack
Assistant Professor of Energy Policy and Economics
The Pennsylvania State University
Tel: +1 412-425-8001
E-mail: blumsack@psu.edu

Course Overview

Markets for petroleum and natural gas are often viewed as examples of "successful" transitions from regulation to deregulation in the energy industries, while electricity has proven far more difficult. This module will introduce students to the economic fundamentals of regulated industries, and the transition away from regulation towards competitive markets for energy commodities. The oil, natural gas and electricity industries will all be discussed, but the module will spend more time on the electric power sector as a case study of the difficulties involved in deregulation of energy commodities. The course will also discuss the impacts of market-influenced environmental regulation on the operation and performance of energy markets.

Background Requirements and Prerequisites

There are no formal prerequisites for this course. Students who have had at least one basic economics class will find themselves more comfortable with some of the economic concepts discussed in the module.

Course Organization and Grading

Class meetings will consist of a mix of lectures and class discussions. Students are expected to participate in class discussions and should come to class familiar with the assigned reading material. There will be three problem sets assigned during the module, plus a take-home final exam. The problem sets will count towards 30% of the final grade (10% each), while the final exam will count towards 70% of the final grade. Students are encouraged to work together on the problem sets, but each student must turn in his or her own work. Students must work individually on the final exam.

Textbook and Readings

1. Steven Stoft, *Power System Economics: Designing Markets for Electricity*, Wiley-Interscience, New York, 2002. [Required Text].
2. Alfred E. Kahn, *The Economics of Regulation: Principles and Institutions Volumes I and II*, MIT Press, Cambridge MA, 1998. [Required Text; the two volumes are generally sold as a set].

The following readings will be made available by 29 May 2009 in a zipped file at http://www.personal.psu.edu/~sab51/vls.zip

3. Burlington Electric Department, 2009 – 2010 Budget and 2009 Rate Case Filing.
4. Seth Blumsack and Lester Lave, "Mitigating Market Power in Deregulated Electricity Markets," mimeo.
5. Adam Newcomer, Seth Blumsack, Jay Apt, Lester Lave and M. Granger Morgan, "The Short-Run Effects of a Carbon Tax on US Electric Generation," Carnegie Mellon Electricity Industry Center working paper CEIC-08-02 (reprinted in *Environmental Science and Technology* 42:9 (2008), pp. 3139 – 3144).
6. Seth Blumsack, "Designing Electricity Rates to Achieve Social Environmental Goals," mimeo.

Class Schedule

Day 1 – 1 June 2009: The Economics of Regulation

- History of regulation in petroleum, natural gas and electricity markets
- Concepts from economics and finance
- Natural monopoly and the economic basis for regulation
- Destructive competition
- Rate-of-return regulation
- Rate-base determination and asset financing for regulated utilities

Readings:

Kahn, *The Economics of Regulation*, Vol. I: Foreword, Introduction, Ch. 1 and 2; Vol. II: Ch. 4 and 5.

Burlington Electric Department, 2009 – 2010 Budget and 2009 Rate Case Filing

Day 2 – 2 June 2009: Deregulation in Energy Markets

Problem set #1 due at the beginning of class

- The Averch-Johnson effect
- Vertical dis-integration
- Market and auction design

Readings:

Kahn, *The Economics of Regulation*, Vol. II: Ch. 1 and 2

Stoft, *Power System Economics*, Ch. 1

Day 3 – 3 June 2009: Architecture and Performance of Electricity Markets
Problem set #2 due at the beginning of class

- Electricity market designs in the US
- Wholesale pricing in deregulated energy markets
- Risk management in energy markets
- Measuring and mitigating market power

Readings:
Kahn, *The Economics of Regulation*, Vol. II: Ch. 1 and 2
Stoft, *Power System Economics*, Ch. 3 – 5.
Blumsack and Lave (2004), especially Sections 1 – 3.

Day 4 – 4 June 2009: Energy Markets, Environmental Quality and Climate Change
Problem set #3 due at the beginning of class

- Cap-and-trade mechanisms
- Emissions markets and energy markets
- Energy efficiency and demand-side market participation

Readings:
Newcomer, et al., *Environmental Science and Technology* (2008)
Blumsack, "Designing Electricity Rates to Achieve Social Environmental Goals," (2009)