

15.031 Recitation



REVIEW FOR QUIZ 2

Summary

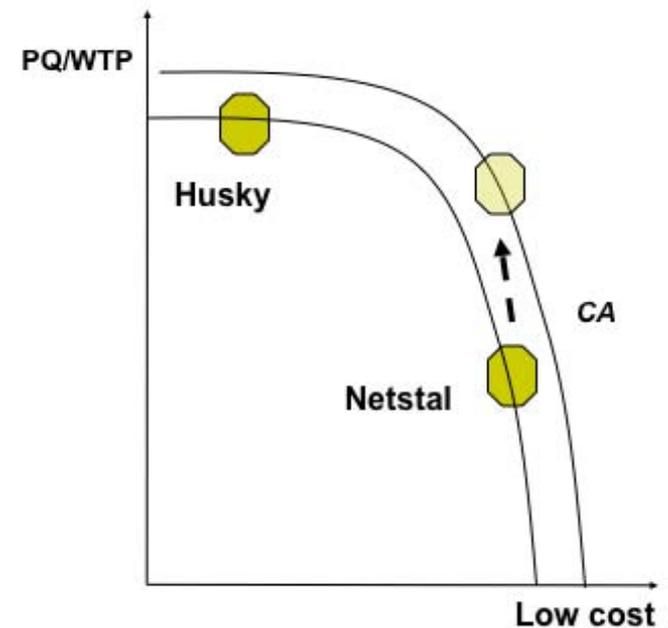


- **Firm Strategy**
 - Investment Decisions and Business Models
- **Non-Renewable Resources**
 - Hotelling Theory and Shale
- **Electric Power Systems**
 - Today's System and the Future
- **Making Public Policy**
 - Social Movements
 - Environmental Regulation

Firm Strategy



- NPV analysis v. strategy
 - Be skeptical of positive NPV proposals
 - Strategy for sustainable advantage, fit and complementarities with projects
- Industry attractiveness v. niches – Porter's five Forces
- Types of Strategy
 - Low-cost versus Quality / Differentiation
- Husky: past strategy, current challenges
 - Further increase buyer WTP
 - R&D, service, etc.
 - How much more room?
 - Improve cost position
 - ✘ Cut perks, salesforce, etc.
 - ✘ Implications for delivering on high WTP?
 - ✘ Cut margins/prices
 - Go after other segments
 - ✘ Consistent with cost structure, culture, etc.?
 - Big challenge: package of changes should fit with each other, existing activities



Non Renewable Resources

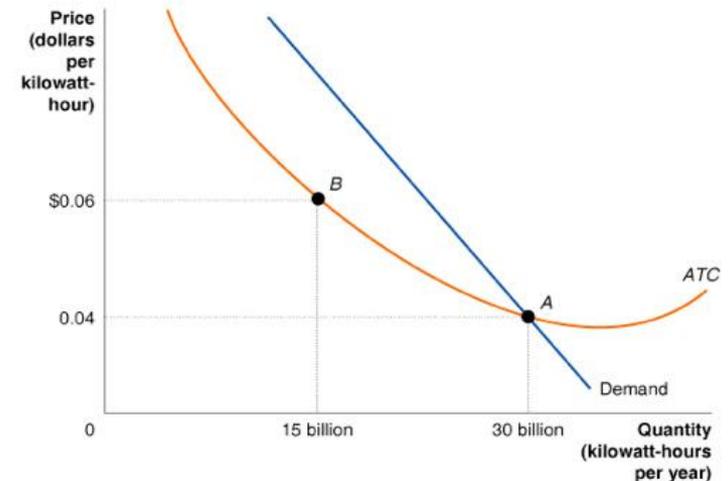


- Production Planning
- Classic Hotelling Theory
 - Owners of non-renewable resources will only produce a supply of their product if it will yield more than instruments available to them in the market (specifically bonds and other interest bearing securities)
 - What does this assume?
 - ✦ Owners of non-renewable resources are motivated by profit
 - ✦ Markets are efficient
 - Why is this useful?
 - ✦ Helps economists predict the price of oil and other non-renewable resources
 - What do you make of this?
 - ✦ If oil prices rise at prevailing interest rates, there would be no restrictions on supply
 - ✦ If oil prices rise faster than prevailing rates, there's no incentive to produce today
 - Reasons Hotelling doesn't hold

Electric Power Systems

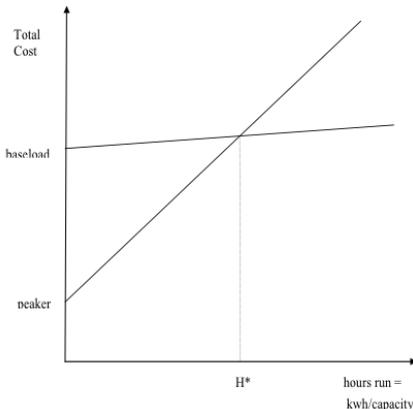


- Output largely not storable
- Time varying and unpredictable demand
- Capacity variation and mixing technologies
 - Base load and peak load plants – costs & benefits
 - ✦ Environmental
 - ✦ Economic –
- Transmission and Distribution
 - Natural monopolies, inefficient to have multiple systems
 - Problems with natural monopolies, solutions
 - ✦ State Regulation and Market Centric Model
- Grid Architecture
 - Tree & Mesh Structure
 - Smart Grids
- Retail prices, time varying nature of costs
- New Technologies



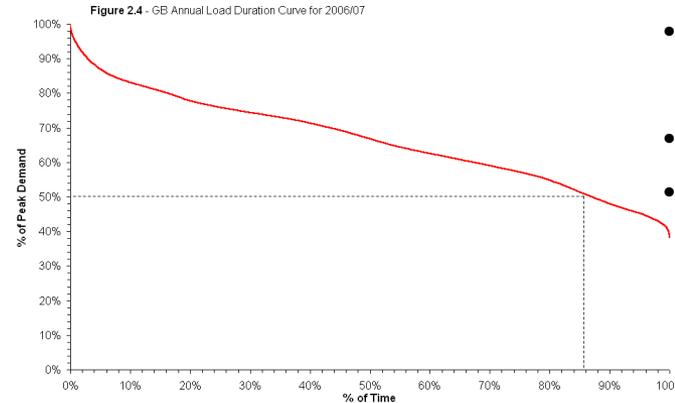
Economic Analysis of a multi-technology system

Cost Analysis



Graph of 2008 supply curve for lower 48 NERC regions removed due to copyright restrictions.

Load Duration Curve, Optimal Mix



- varying demand => varying marginal cost
- Peak loads versus base loads
- Dynamic pricing vs. /kWh pricing

© The National Grid Company. All rights reserved. This content is excluded from our Creative Commons license. For more information, see <http://ocw.mit.edu/fairuse>.

- Generally base-load plants run flat out when they run; other plants can more easily vary output to follow load
- Consider two plants with equal capacities: If you plan to run $< H^*$ hours, the peaker is cheap
- Many technologies, costs: “economic dispatch” = turn on lowest marginal cost units first

Making Public Policy



- Politics versus Economics – How they differ and why they are both needed
- Politics as competition among interest groups – Madison & Lowi, Alternative models – Klein, Whitt
 - Madison: Faction: “a number of citizens ... who are united and actuated by some common impulse of passion, or of interest, *adverse to the rights of other citizens or to the permanent and aggregate interests of the community*”
 - factions are inevitable, but if they are all small & weak, none can dominate competition among them-
 - Lowi: such competition among interest groups has become both an accepted description of US politics and, implicitly, an ideal – “interest group liberalism” – K Street.
- Lowi on Madison
 - ✦ the only way to do that and to be sure that it and the true self-regulatory character of pluralism can be institutionalized is to keep group interests in constant confrontation with one another in Congress. Once an agency is "depoliticized" or "made independent" by handing it over to its organized clientele, the number of "factions" is reduced from a competitive to an oligopolistic situation
 - ✦ Social Movements
- How they come about and differ from interest groups & political parties
- How they influence markets and policy

U.S. Environmental Regulation

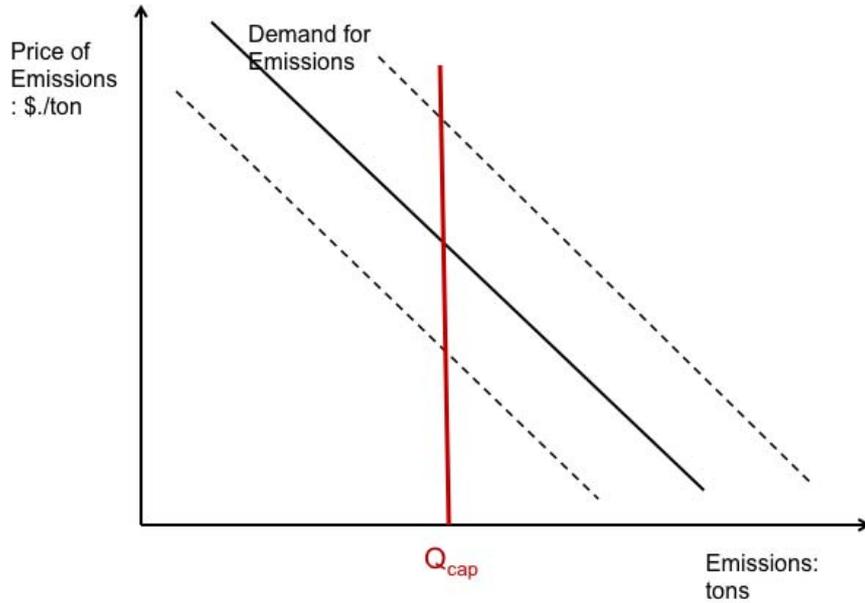


- EPA Regulation
- US Clean Air act of 1970
 - Treatment of new and old sources
 - Implications
- 1990 Acid Rain Program
 - Why it was enacted
 - Implications
 - Economic Analysis
- Incentive to prolong the life of old sources
- Variation in clean-up costs and cost of standard setting - Clean areas resisted scrubbing, national electricity tax and Dirty areas resisted cleanup
- National cap-and-trade (“allowance trading”)
 - Other environs held their noses; no alternative way forward
 - Allowance allocations were used to build a coalition
 - Small part of big clean air bill
 - Once passage seemed likely, wild scramble for allowances
- Took effect in 1995, on schedule, and Acid Rain declined

Economic Analysis

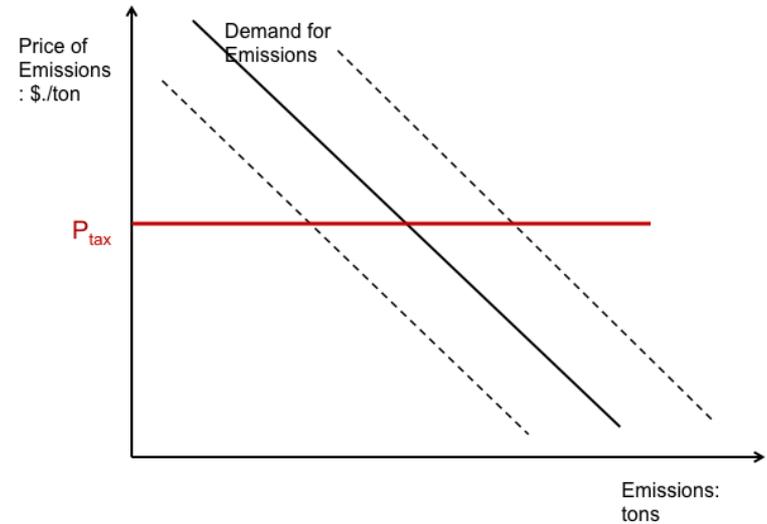


Cap and Trade



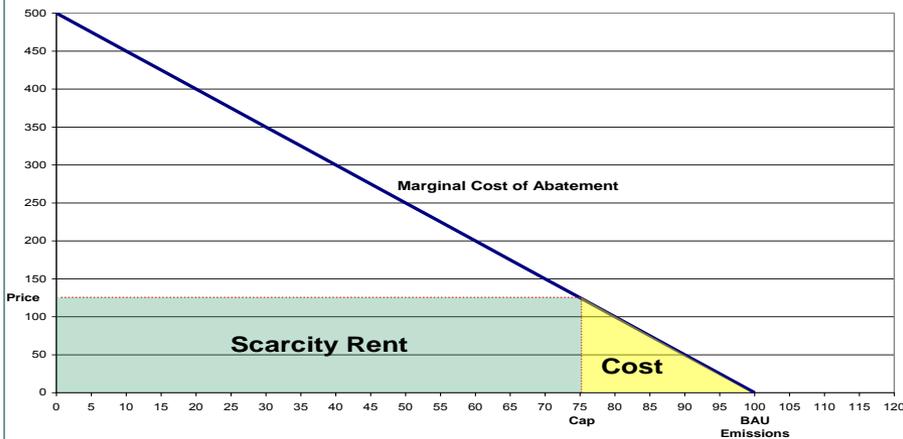
Not a great surprise when you think about it; short-run demand inelastic, supply perfectly inelastic, but bothers both industry and environs.

Taxation



A tax would have given price stability but quantity risk (environs hated) and greater burden on utilities (they hated)

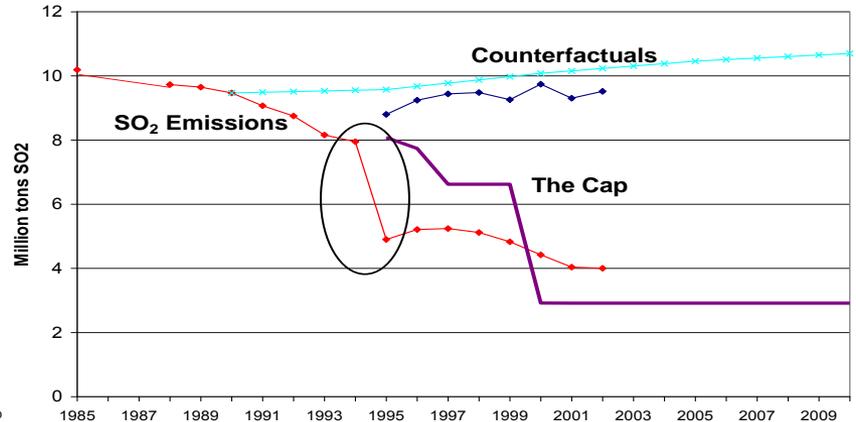
The 1990 Acid Rain Program



Note: Marginal Cost curve is Demand for Allowances curve, normalized to 100 at Price = 0

SO₂ Allowance Price Index

Source: Cantor Fitzgerald



- Standards always have an incentive to cut, no matter how clean
- Produced considerable innovation: e.g., coal blending, cheap scrubbers

- SO₂ prices moved more than some expected

Final Papers



- 10 minutes per team
- Format: 5-6 minutes presentation (max. 3 slides), then 4-5 minutes to answer questions
 - 2 people to present, other 2 to take questions
- Other Questions?

MIT OpenCourseWare
<http://ocw.mit.edu>

15.031J / 14.43J / 21A.341J / 11.161J Energy Decisions, Markets, and Policies
Spring 2012

For information about citing these materials or our Terms of Use, visit: <http://ocw.mit.edu/terms>.