Essentials of Energy
4/14/05

Key concepts for the day

Markets
monopoly
Substitution
volatility
Energy intensity
Levelized costs
externalities

I. Market essentials

Are there working energy markets?

Market problems

- Monopoly/ market power
  - More true for different resources
    e.g.: electricity vs. coal
  - Natural monopolies
  -
- Disruption:
  - long supply chains, transportation bottlenecks (railroads and coal, Suez and Panama canals for oil and gas); long electrical transmission lines are vulnerable
  - international geo-political issues
- Speculation
- Long lead times for development so supply is not very responsive to demand—and vv. – but it ultimately is
- Extensive regulation for environmental and other purposes
- Subsidies/incentives: resources that would not be cost-competitive in the market get used anyway: nuclear power.

short term "no"—

- great volatility
- hard to deploy capital with confidence: investments are risky

But "yes" over the long run:

Substitutability: key concept; ultimately there end-runs/alternatives to all of the problems noted above

One fuel for another
Efficiency for fuel
New technologies for old

Big Policy question: how to manage short term markets in order to get the benefits of long term market

Energy is unusual because the usual presumption in the US in favor of markets is not granted:

- Tendency toward monopoly
- Extensive Environmental regulation is needed
- Economic fairness in costs/rates

Right balance of regulation and market freedom

Regulation of markets: so they work as they should:

low volatility

easy entry and exit

appropriate elasticity

easy introduction of better products and services

Tools:

Market oversight

Incentives:-tax credits, subsidies-when needed

Regulation of rates if natural monopoly or public ownership

II. How alternatives are chosen in a "least-cost, integrated planning" regime

Monetize all costs including environmental externalities

Levelize the cost over time (discount rates, payback time, etc.)

Compare levelized costs

Choose the lowest resources with the least overall risk.