Whither Energy Prices?

- Natural gas tsunami
  - Dirty dozen items
- Energy *system*
- A focus on the supply side
- Say hi to "God and Charlie"

Betting the ranch

- **90 % + of new power plants to be gas-fired**
  - 180,000 MW planned next 3 years
- Coal-fired generation takes more time to site, build infrastructure
- Nuke discussion resurfacing
- Renewables to get bigger piece of pie?

Everybody loves gas

- Clean molecule; US uses **22 tcf/yr**
- Dislike of coal, problems with nuclear
- Undoing dams in the NW
- Wind and solar = less than 1% elec.
- 54% of homes heat with gas
- Industry uses 46%, power 15%, residential and commercial 39%

Gas is regional

- We import oil from overseas (about 60%, including products)
- And yes, we import gas from Canada (3.5 tcf/yr, 16%)
- But only 1% of gas comes via LNG imports (up to 3% in two years when two old LNG ports are demothballed)

Pipes and caves

- Nationwide pipeline system delivers
- Storage caverns hold about 15%
- Pull from caverns during cold season
- Fill them back up spring to fall
- What happens when AC prevents filling, or even draws from storage, during the summer? Robbing Peter to pay Paul...

Bigger tools, smaller pools

- It's easier to locate gas than it used to be
- BUT..the pools we're finding are smaller
- ...and they're depleting faster
- ...and tight sands are slower producers
- ...and subquality (sour) gas isn't a winner; needs separate processing

Raging depletion

- "Don't go there..."
- Started out with Estimated Recoverable Resource (EUR) of about 2000-2150 trillion cubic feet (tcf)
- We've consumed 950 tcf
- There are 1050 – 1200 tcf left (including "undiscovered" and subquality gas)
- On a treadmill...

Drill baby drill

- 320,000 gas wells (1 per 900 people)
- 900 US rigs drilling for gas vs. 200 drilling for oil (1 per 320,000 people)
- Most of Canada's 550 rigs also seeking gas
- Personnel problems (mergers, retirements)
- Rigs are rusty; cannibalizing old for new
- Drilling to 6,000' vs. 19,000': 5-10 times slower
- WCS Basin: big pools are deeper

Gas on ice

- Alaskan gas will take a while; think 2006, 2007, maybe even later
- 1.5 to 2.5 tcf/yr pipeline (up to 10% of consumption when it arrives)
- Soon after the pipeline arrives, US production peaks; think 2010-2012
- Deepwater gas dispersed, also slow to market

The Canadian Card

- We use half their gas
- They have lots in their frontier zones (some off east coast; more in the Yukon)
- Some are starting to complain about prices, debate the Deal with The Devil (NAFTA)
- If they ever change their minds about exports, we're in *deep* trouble
- Recently changed about exporting electricity
- Export limit is projected at 5.5 – 6.0 tcf/day

Futures Follies

- Traders= flea on tail wagging the dog
- Wild gyrations
- No consistency in signals
- Provided only a 6-month warning about the train wreck this past December
- $9+/mmBtu for 3 weeks in Dec/Jan
- Warmer weather = $5+ today

Lack of systems thinking (re gas)

- Drilling dominated solutions
- Mother of all assumptions—gas will be there for the power generators
- Users and drillers don't talk details
- Amount of resource vs speed of delivery
- News flash re resource limits
- Five years ago, under-predicted demand
- Matt Simmons = Joe Lstiburek

Prices (re gas)

- Volatility, higher price band ($3.50 - $6.00)
  - vs. $2 pre -2000, $3.75 ave. for 2000
- Demand can respond faster than supply
  - **Demand *destruction***
    - Farmland Industries: shut down some fertilizer plants
    - Potato flake factory in Center(CO)
    - Competition between consumers (esp. elec.)
- North American supplies will eventually peak (30tcf/yr vs EIA's projected need of 39 tcf/yr)
- Price problems in advance of that peak
- Shouldn't we take the long view?

Think energy system (like "house as a system")

- Crude oil:
  - supply/demand/price = volatile
  - Non-OPEC (depletion) vs. OPEC (control)
  - Weak conventional wisdom (forecasts)
- Electricity: only gas can "move fast"
- Investors: "old" vs. "new economy"
- World factors: growth, demand shifts, environmental wild cards

Looming energy policy debate

- Previous policies long on talk, short on wisdom and action
- Past efforts aimed at cheap gasoline, two-car garages and plenty of pavement
- Notion of geologic limits absolutely discounted, refuted: "crazy aunt in the attic"
- Drill bit gets $$$ breaks to find fossils
- Technology uber alles
- Lack of balance earlier, *and* today