

ENERGY BUSINESS WATCH

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Energy Business Watch

American Society for Peak Oil

Time to Stop Playing Russian Roulette with the U.S.
Economy – Urgent Need for a Realistic Strategy

Sacramento, California

September 23, 2008

Presented by:
Andrew D. Weissman

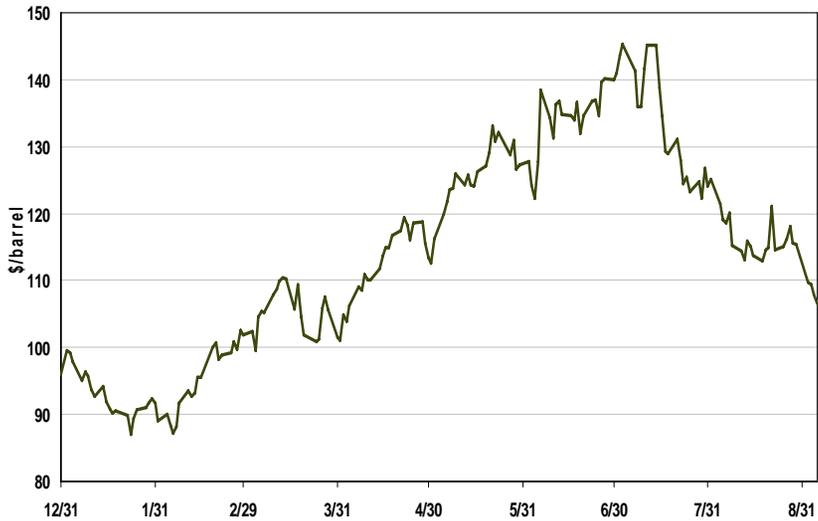
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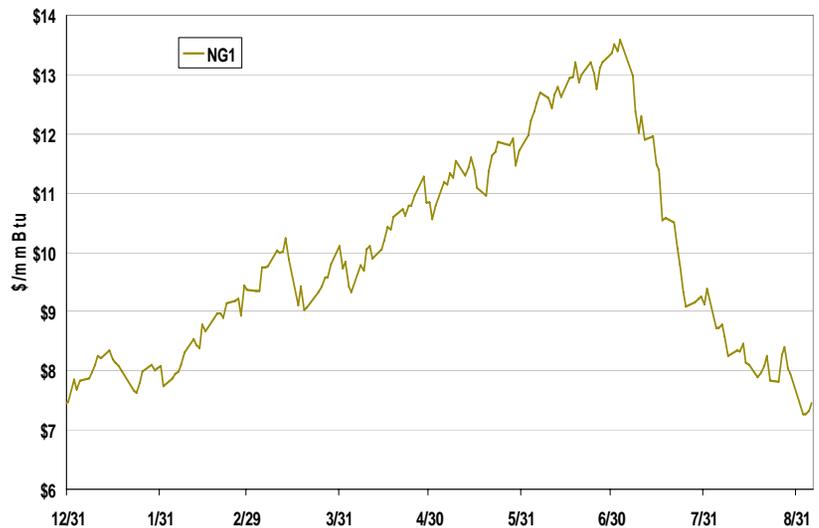
Grave Risks Ahead

- Stakes couldn't be higher
- While prices could remain moderate for 24-36 months, risks to U.S. economy *far more severe* than recognized
 - Price shocks 1st ½ '08 early warning of potentially severe future shocks
 - Not just oil but electricity & Liquefied Natural Gas (LNG)
 - Could lead to major economic downturn & cripple manufacturing sector
- Action urgently required – no time to waste

Front Month Crude Since 12/31



Front Month Gas Since 12/31



Five Steps Essential

1. Far greater sense of urgency required
 - Few other issues likely to affect nation's future as deeply
 - Even sub-prime pales by comparison
2. Replace Energy Information Agency (EIA)
 - Realistic estimates of supply & demand essential
 - Currently flying blind; estimates mislead rather than inform
 - Requires creation of National Energy Security Supply Board akin to Federal Reserve Board
3. Develop comprehensive national energy strategy applicable to energy use across-the-board
 - Must include electricity & natural gas, not just oil
 - Integrated planning essential to achieving lowest cost, timely & effective solutions
 - Market will ruthlessly seek out lowest cost Btus + push prices to parity

Essential Steps -- Continued

4. Maximize use of all domestic resources that can be developed cost effectively in environmentally sound manner
 - Can't afford to rule out resources or rely on pipe dreams
 - Coal = lynchpin to achieving effective solution
 - Supply deficiencies due to price spikes or shortages have huge social costs
 - *Disadvantaged likely to suffer greatest harm*
 - *Lost opportunities & direct impact on health*
5. Use best expertise available to evaluate realistically limitations of every supply option in objective, cold-blooded manner
 - Includes limitations on available capital
 - Total *cap ex for electric utilities last 5 years only ~ \$ 250 billion (incl. T&D) -- a new record high*
 - *Total expenditures of \$ 2 -5 trillion next 10 years inconceivable*

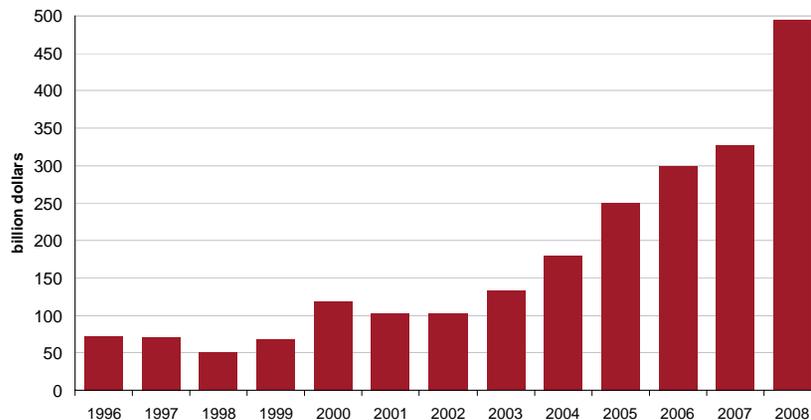
Key: Developing Comprehensive, Realistic Plan

- Can't afford to fall short of meeting energy supply needs
 - True shortages will lead to unprecedented price increases
- Timing, capital constraints and cost effectiveness all hugely important issues
 - Discussing or debating issues so critical to future of economy without rigorously evaluating these issues difficult to understand or defend
 - To shocking degree (and needlessly) energy policy being developed largely in an analytical vacuum
- Cries out for comprehensive national strategy + ruthless expert evaluation at national level of feasibility & limits of each option
 - Currently neither occurring
 - Recipe for disaster
- Btu convergence, linkages between electricity & transportation strategy also likely to rapidly increase

Urgency of Oil Crisis Still Not Fully Understood

- T. Boone Pickens has helped to educate American public re huge impact on U.S. balance of payments deficit
 - \$ 300 billion + increase last 12 months alone
 - Forces U.S. to borrow \$ 2 billion/day + from China & others
- Increasing drain on discretionary spending by key groups
 - Adds to downward pressure on economy + restricts Fed options

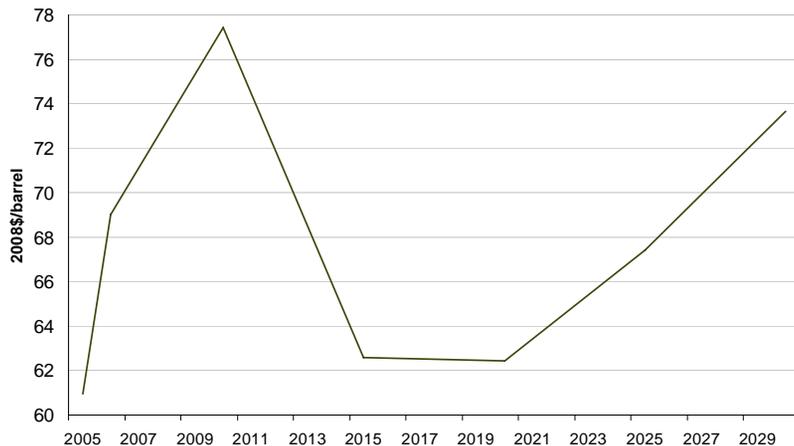
**Growth in Payments for
Foreign Crude Oil**



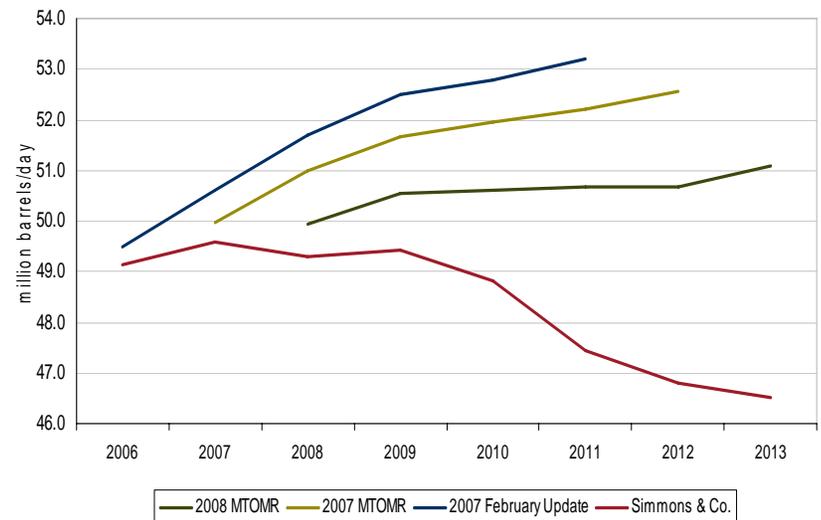
High Risk of Steep Further Price Increases

- EIA and IEA projections continue to consistently over-estimate likely supply
- Non-OPEC supply certain to decline (July '08 Simmons study)
 - New fields peak at just 55 % of projected production, 5 month delay in start-up
- Creates far greater risk than price forecasts indicate
 - Lessons of 1st ½ '08 price explosion still not properly understood

AEO 2008 EIA Price Forecast



Likely Decline in Non-OPEC Supply



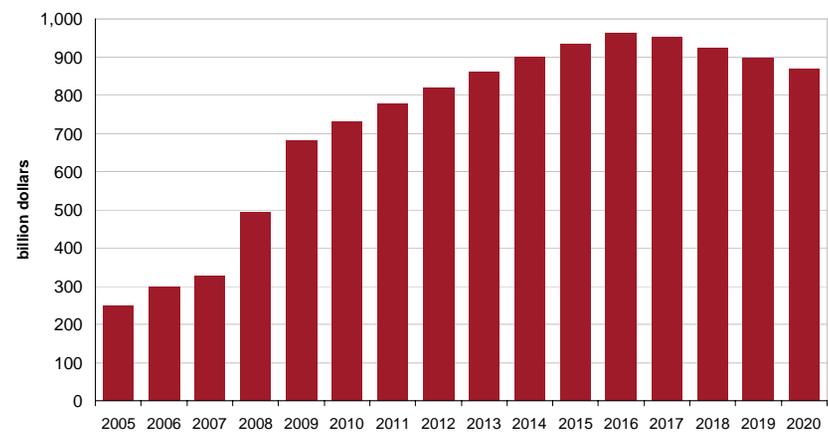
Could Cripple U.S. Economy

- Even if NYMEX crude peaked at just \$ 250/barrel, could equate to \$ 11.8 trillion cost increase between 2010 & 2020
 - Potential \$ 3/billion *per day* cost for oil imports
 - May require steep interest rate hikes to attract required capital
- Could cripple U.S. economy

**Consumption Cost Difference from AEO 2008
EIA Price Forecast**

Year	\$/barrel NYMEX	\$/barrel AEO2008	\$/barrel Difference	(million barrels) Total Oil Consumption	Additional Cost (billion \$)
2009	\$ 140	\$ 77	\$ 63	7,548	\$ 475
2010	\$ 155	\$ 81	\$ 74	7,473	\$ 555
2011	\$ 170	\$ 78	\$ 92	7,398	\$ 683
2012	\$ 185	\$ 75	\$ 110	7,324	\$ 809
2013	\$ 200	\$ 72	\$ 128	7,251	\$ 932
2014	\$ 215	\$ 68	\$ 147	7,178	\$ 1,052
2015	\$ 230	\$ 65	\$ 165	7,107	\$ 1,170
2016	\$ 245	\$ 67	\$ 178	7,036	\$ 1,252
2017	\$ 250	\$ 69	\$ 181	6,965	\$ 1,263
2018	\$ 250	\$ 70	\$ 180	6,896	\$ 1,239
2019	\$ 250	\$ 72	\$ 178	6,827	\$ 1,215
2020	\$ 250	\$ 74	\$ 176	6,758	\$ 1,192
					\$ 11,837
				Total	

Cost of Oil Imports



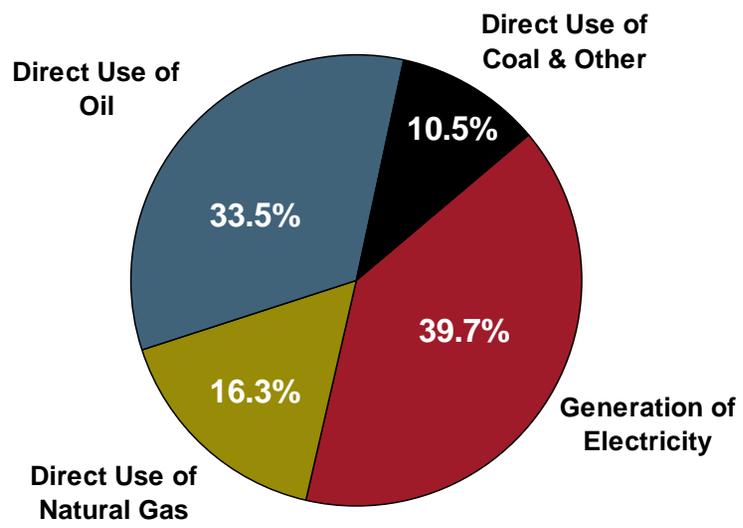
Reducing Oil Dependence Most Urgent Issue

- Should be in red hot panic if significance of impact of looming net decline in total global oil supplies fully understood
- Need to greatly accelerate deployment of available options
 - Especially electric plug-in hybrids, coal-to-liquids, CNG
 - Could reduce oil imports by 40 % or more within 10 years
- But must assess potential impacts of oil reduction strategy on comprehensive
 - As ethanol illustrates, must include impacts on broader economy & price & supply of other energy commodities
 - Impact on total demand for electricity + electricity prices could become increasingly important
 - Must also carefully examine impact on demand for natural gas and price of natural gas for other uses
 - Hundreds of billions of dollars/year in costs potentially at stake

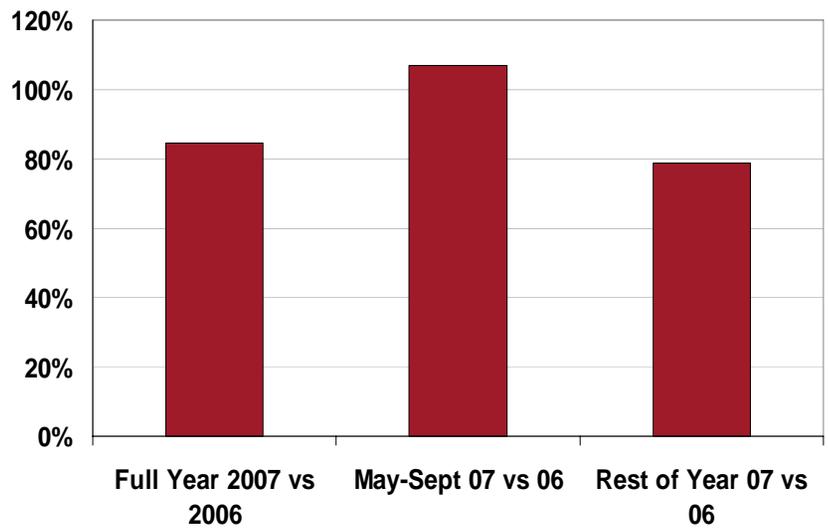
Electricity & Gas Crisis Could be Just as Severe

- Impact of higher natural gas & electricity costs on U.S. economy potentially could be just as severe
- Electricity & natural gas account for most other use
 - Electricity prices increasingly driven by natural gas
 - Liquefied Natural Gas (LNG) currently expected to marginal source of supply

U.S. Energy Use



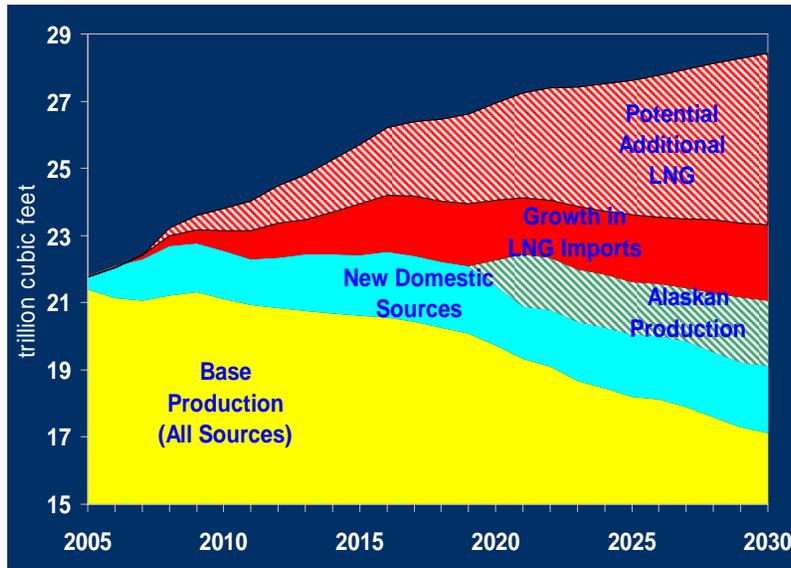
% of Incremental Electricity Supply Obtained from Gas-fired Generation



Global LNG Price Already Near Parity with Oil

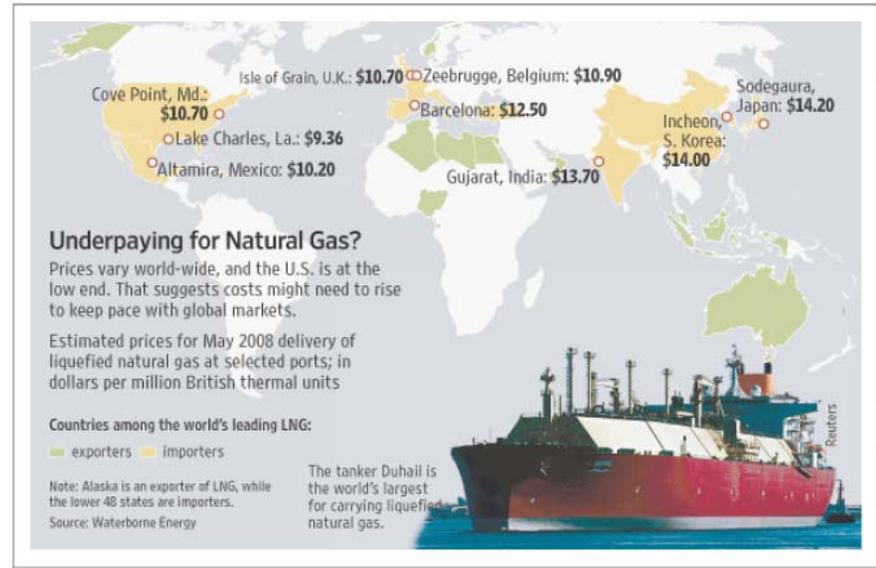
- Spot price already near parity with crude for this winter
 - Despite multi-year low for U.S. imports
- While prices could moderate in '09 and '10, by early in next decade likely to be priced at premium to crude

Demand Could Far Exceed Estimates



Source: EIA, Energy Business Watch Est.

Spot Market Already Up to \$ 22-30/mmBtu



Source: April 18, 2008 Wall Street Journal.

Devastating Potential Consequences

- Adverse impact on U.S. economy could be severe
- Threatens North American-wide repeat of 2000 Calif. crisis
 - Potential for jaw-dropping price increases
- Industrial natural gas supply likely to decline most steeply
 - Political leaders will not home heating or lights go out

Unprecedented Price Increases Possible

Oil	Nat. Gas-Crude Parity	Nat. Gas - Diesel Parity	Equivalent Wholesale Power Price
\$/barrel	\$/mmBtu	\$/mmBtu	\$/MWhr
\$150	\$25.90	\$31.00	\$220-\$260
\$200	\$34.50	\$41.40	\$290-\$355

Potential 2X-3X Cost Increase

Oil	Nat. Gas-Crude Parity	Nat. Gas - Diesel Parity	Equivalent Wholesale Power Price
\$/barrel	% change	% change	% change
\$150	124%	168%	180%-240%
\$200	198%	258%	270%-350%

Two Starkly Different Alternatives

- Energy prices exquisitely sensitive supply/demand balance
 - 1st 9 months of '08 vividly illustrate
- If domestic energy supply development adequate to meet U.S. needs & minimize LNG imports, could play major role in:
 - Spurring renewed growth of U.S. economy
 - Providing a major competitive *advantage* to U.S. industry
- But dependence upon LNG at \$ 150-200/barrel could have severe adverse impacts
 - \$150/barrel energy for largest electricity user in world

Unprecedented Increases Likely

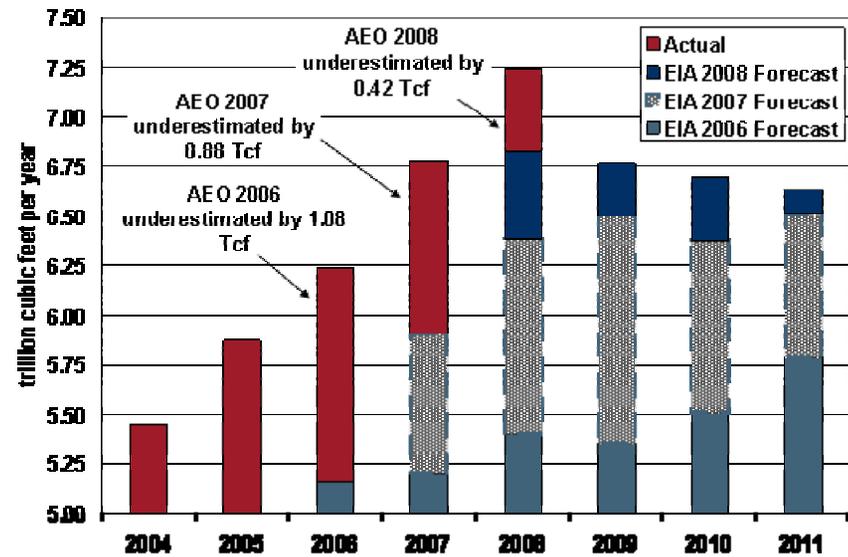
Direct Gas Use	\$200 billion/year
Increased Electricity	\$350 billion/year
Total	\$550 billion/year

- \$ 5 trillion impact over 10 years

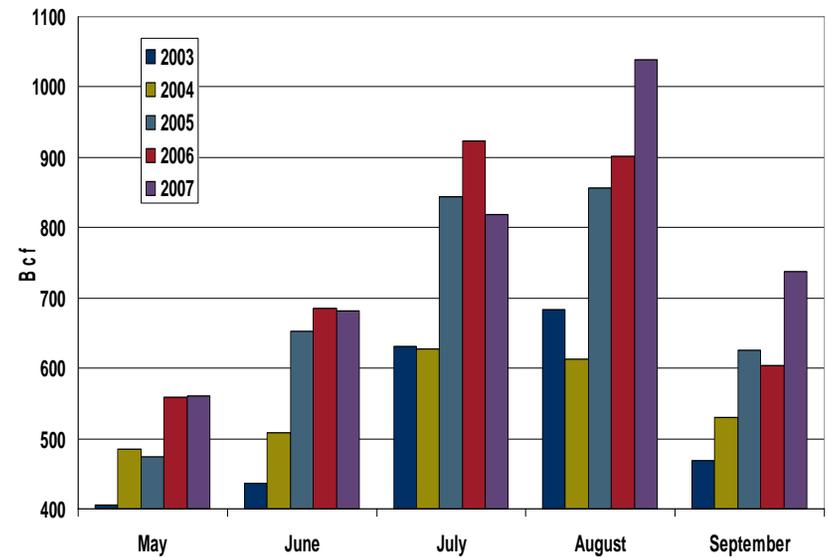
Demand Likely to Far Exceed EIA Estimates

- Even in “status quo” scenario, EIA severely underestimates likely growth in power sector demand for natural gas
 - Repeatedly projects little or no year-over-year growth
 - More likely scenario: increase of 3 Tcf/year + by 2018 even if no new climate change restrictions adopted
 - Cancellation of coal-fired plants past 24 months locks-in

EIA Estimates of Power Sector Demand for Natural Gas



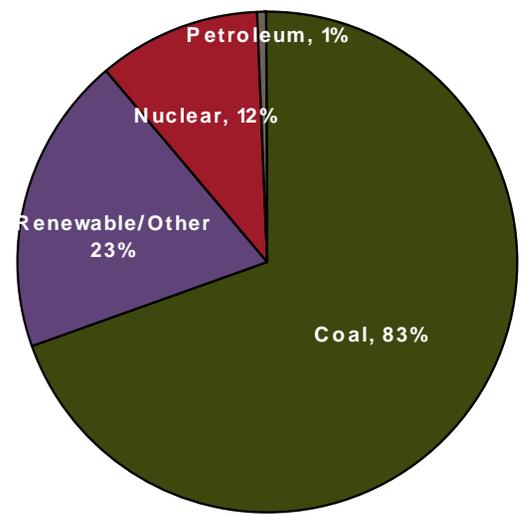
Increases in Monthly Consumption



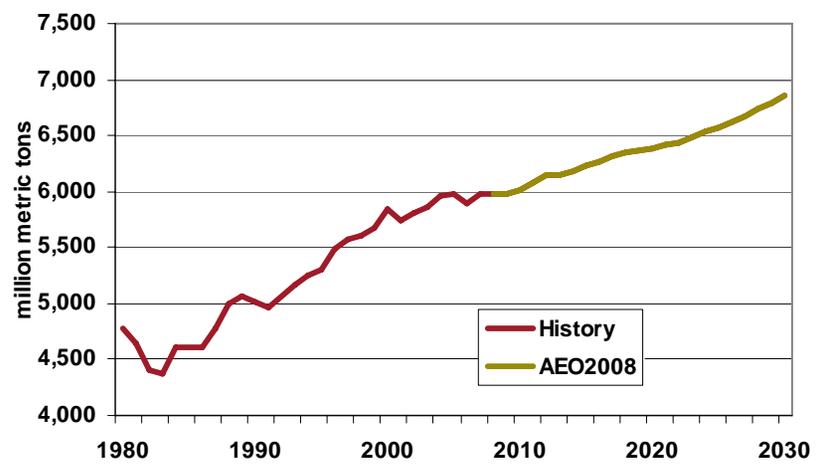
Future Use of Likely to Have Major Impact

- Long-term natural gas demand forecasts still premised on assumption > 80 % of all incremental electricity supply will come from expanded use of coal without CCS
- Will only occur if recognition of critical need for expanded use of coal increases

EIA Projection of Incremental Generation, 2007-2030



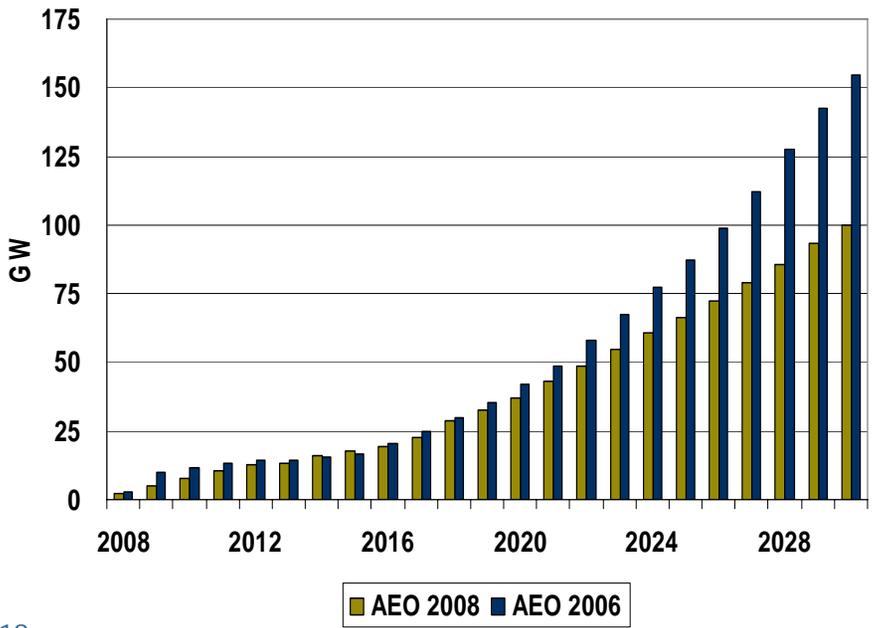
Projected CO2 Emissions With Expanded Coal Use



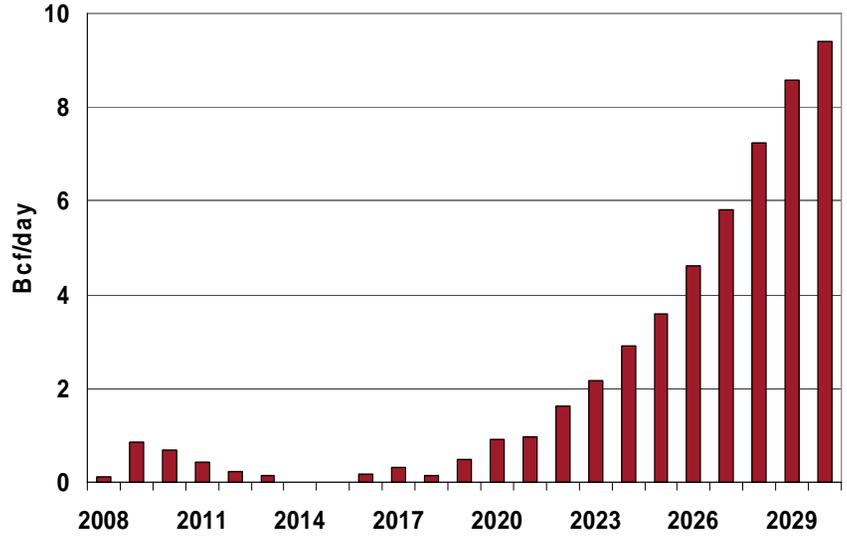
Expected Gas Use Already Beginning to Explode

- Coal-plant cancellations already adding dramatically to expected use of gas
- Impact shown in AEO 2008 just “tip of the iceberg”
 - Many more cancellations or delays under consideration
 - High percentage likely to be replaced with natural gas

Decline in Expected Coal-fired Additions – AEO 2008 vs. AEO 2006



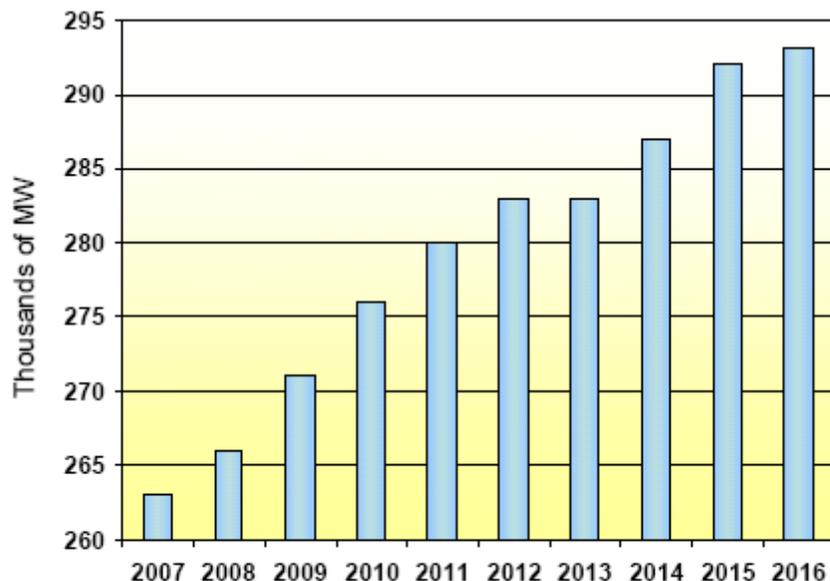
Potential Impact on Natural Gas Consumption



Gas-Fired Additions Zooming Nation-wide

- Last year's NERC forecast reported major increase
- Accelerating rapidly since – partly due to state CO2
- EIA ignores almost entirely in AEO 2008
 - Could lead to 6 to 10 Bcf/day increase in < eight years

Large Increases in Power Sector Gas Use Already Locked In



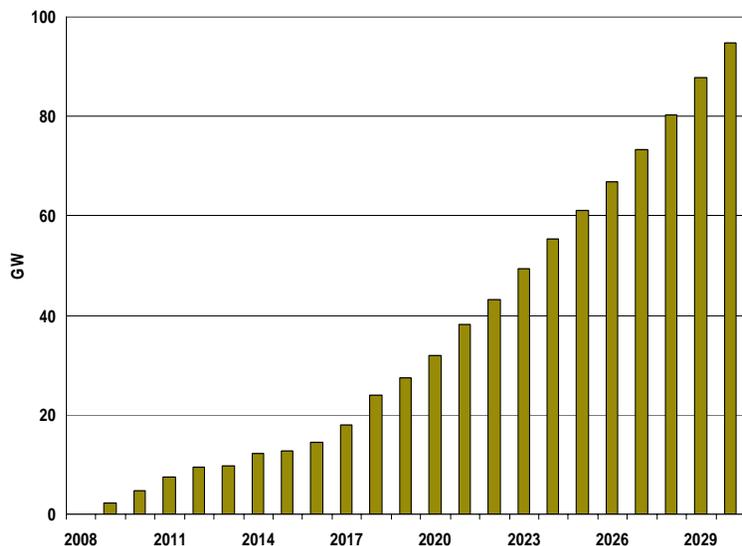
Source: NERC Oct. 2007 Long-Term Reliability Assessment

Natural gas is expected to fuel 22% of electricity produced in the U.S. by 2016.

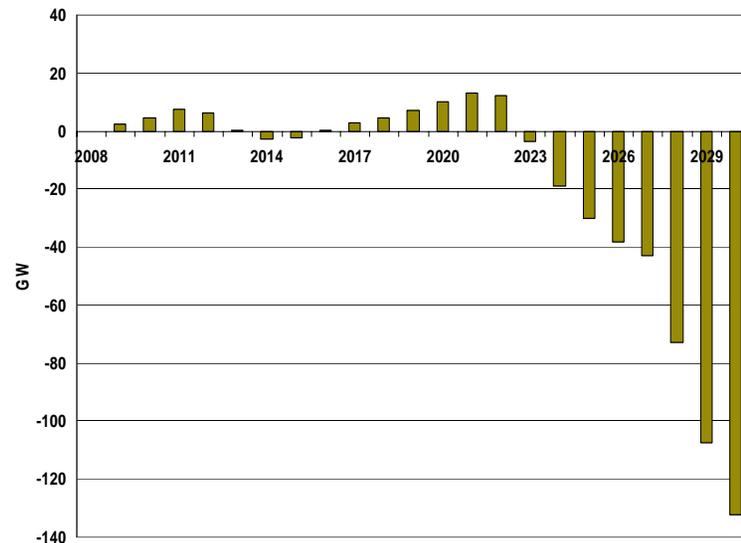
Long-Term Gas Demand Could Explode

- If major federal climate change restrictions enacted, increase in natural gas use could be staggering
 - 1/3rd or more of existing coal-fired fleet might be retired

**New Coal-Fired Capacity -- AEO
2008 Reference Case**



**New Coal-Fired Capacity --
Lieberman-Warner Core Case**



- Even with less severe restrictions, pressure for increased gas use likely to be very intense

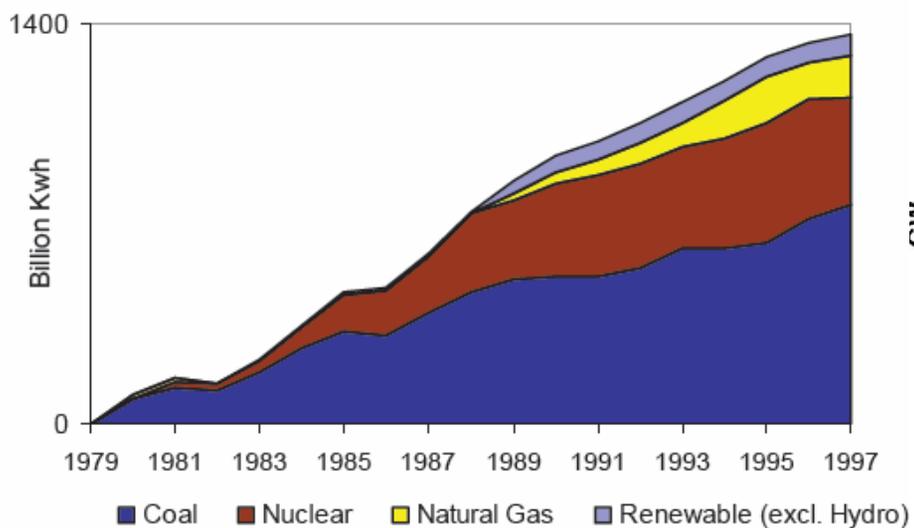
Decision-Makers Flying Blind

- Bottom line: EIA potentially understating future U.S. gas demand by as much 6 to 10 Tcf/year (16-27 Bcf/day)
 - Leaves producers, regulators without any reliable basis for decision-making
- Potential adverse consequences include:
 1. Misleading signals to both producers & end users
 2. Much higher prices than would be likely if market better informed & could better anticipate demand
 3. Risk of periodic supply shortages
 4. Rapid increase in dependence upon LNG, in a market in which supplies likely to be limited and global competition fierce
 - *Large portion of world turning to LNG as incremental source of supply at same time, as part of GHG strategy*
- Worst case scenario: much of U.S. energy supply becomes tied to global price of oil in a post-peak oil world
 - Not just transportation fuels, but electricity & natural gas

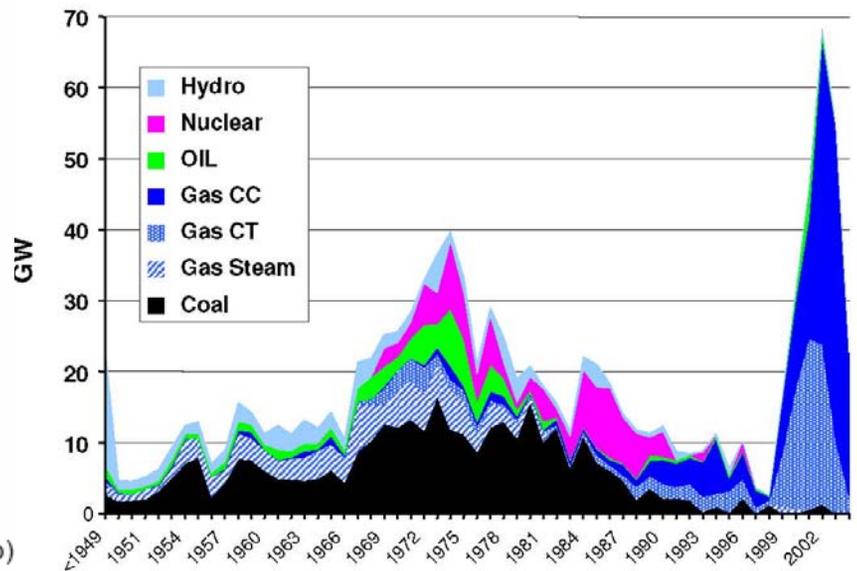
Past Miscalculations Have Led to Debacles

- Abrupt shift in U.S. generation strategy earlier in decade
 - Penetration of natural gas nearly doubled in < 5 years
 - More than \$ 100 billion of new gas-fired capacity (225 GW +)
- Prior to late '90s, coal and nuclear remained dominant sources of incremental generating capacity

Source of Electric Generation to Meet Incremental Demand (1979-97)



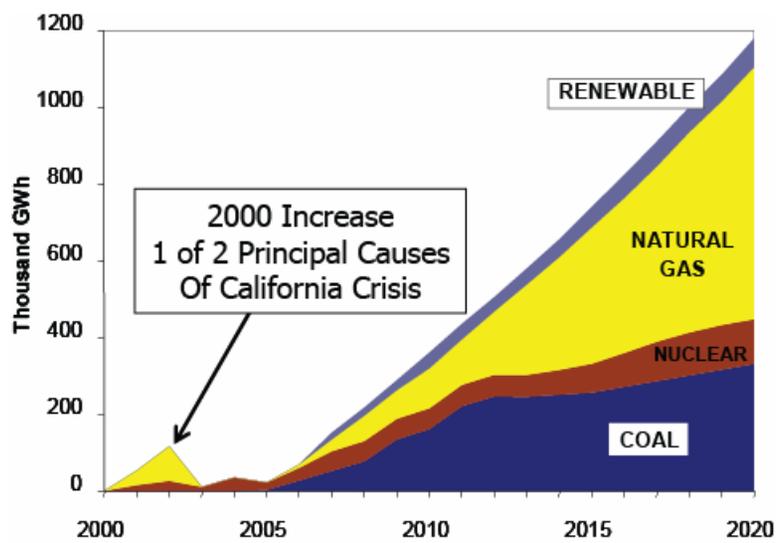
Electric Generation Capacity Additions by Fuel Type



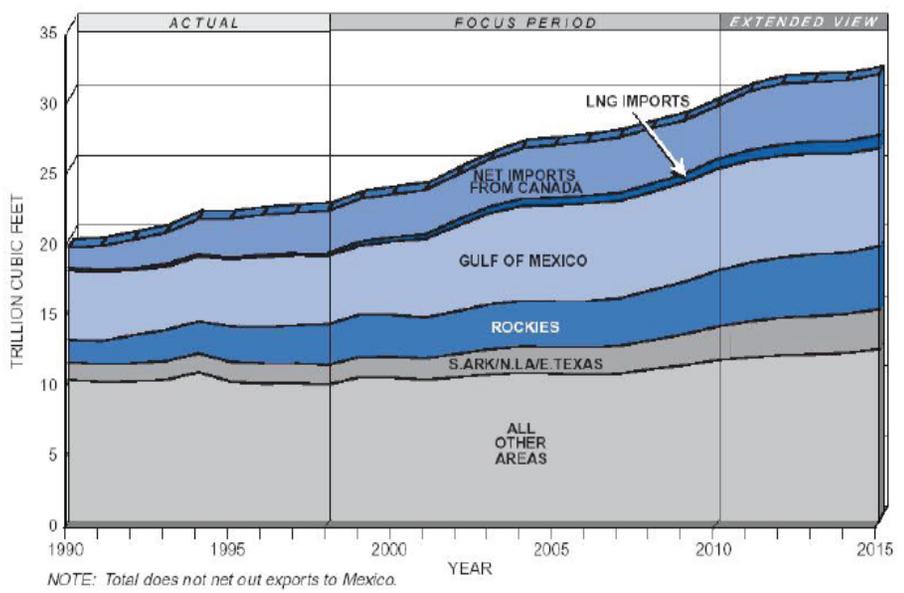
Massive Market & Policy-Making Failure

- Guaranteed rapid increase in power sector gas consumption
 - Premised on EIA/National Petroleum Council projected natural gas supply increases that failed to materialize when needed

Dependence Upon Gas-Fired Generation Likely to Continue to Grow



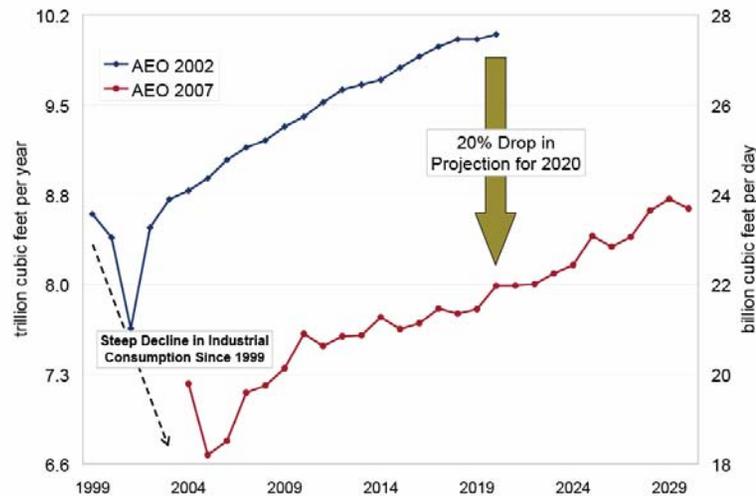
U.S. Natural Gas Supply by Source



Result: Steep Price Increases Inevitable

- To balance supply and demand could require steep price increases with brutal impact -- particularly on industry
 - Since 2002, \$600 billion + cost increase

Projected U.S. Industrial Consumption, AEO 2002 vs. AEO 2007



Higher-than-Expected Costs for Natural Gas

Year	Ave. Wellhead Price (\$/mcf)	2002 Est.	Difference	End-User Impact (\$billions)
2002	\$2.95	\$1.98	\$0.97	\$22.320
2003	\$4.88	\$2.37	\$2.51	\$55.923
2004	\$5.46	\$2.58	\$2.88	\$64.483
2005	\$7.51	\$2.66	\$4.85	\$108.689
2006	\$6.42	\$2.70	\$3.72	\$81.170
2007	\$6.95	\$2.71	\$4.24	\$96.969
Total				\$429.553

- Far steeper price increases by early to mid-next decade
 - Most price sensitive users already driven out of market

Urgent Need for Strategy to Meet Total Needs

- Urgent to develop comprehensive plan to meet other 60 % of energy needs – especially during critical next 10-12 years
 - Risk of severe price spikes & shortages most acute
- Focus on five ripest options:
 - Energy efficiency
 - Increased natural gas
 - Next generation nuclear
 - Wind
 - Increased coal
- Many questions – urgent need for answers
- Complexities & uncertainties make sub-prime look like a day at-the-beach
- Stakes far too high not to assess these issues in depth
 - Requires the best expertise & data available



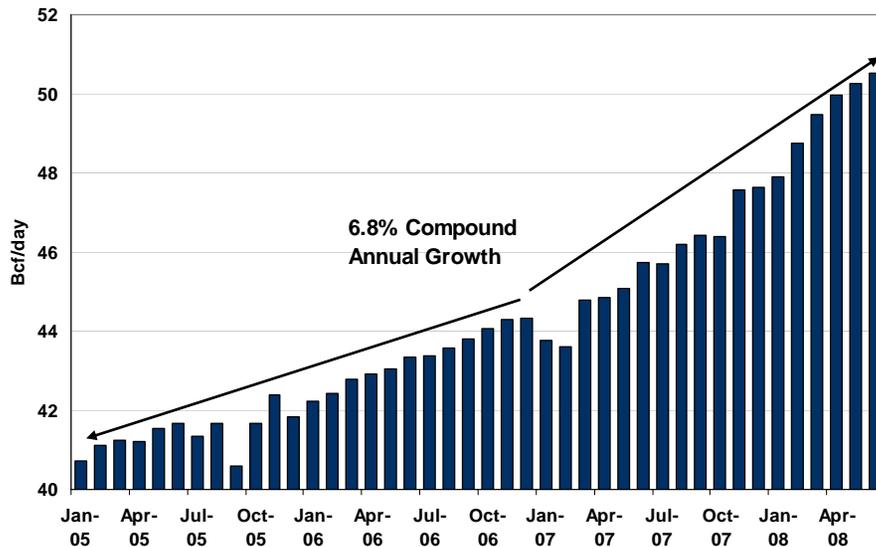
Must Realistically Assess Energy Efficiency

- Clearly first on list
- Huge *potential* savings from energy efficiency, especially:
 - Electric plug-in hybrids;
 - Commercial office buildings & retail shopping malls
- But programs to date often fall well short of goals
- Not always based on realistic assumptions
- Motivating action difficult
- Requires out-of-the-box strategy
 - Large scale implementation still will take time, even though often quicker than other options
- Forced cut-backs in use from sky-high prices or shortages can have huge social costs
 - Eliminates opportunities for disadvantaged, direct impact on health
 - Often may simply entail moving jobs overseas, where environmental standards may be lower

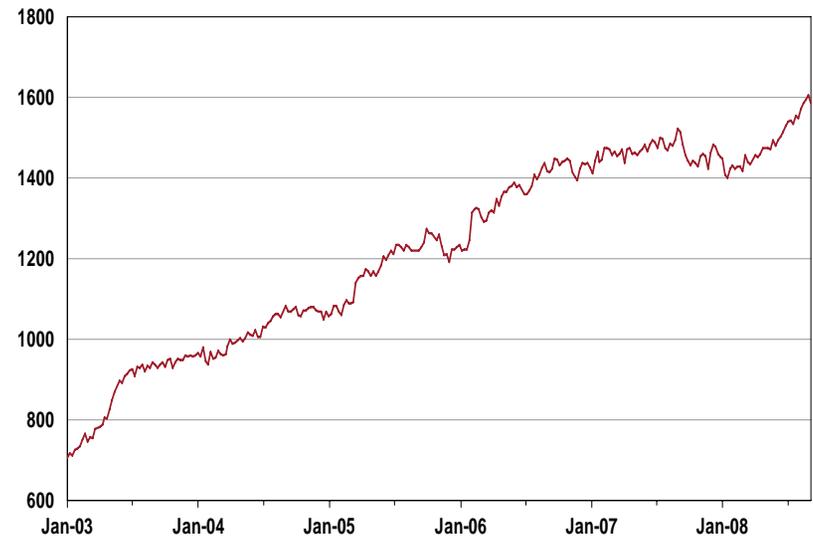
On-Shore Production Sky-Rocketing

- Pace not likely to be sustained
- Results from unusual combination of events:
 - Completion 1st stage of Rockies Express + huge drilling ramp
 - Explosive Barnett Shale growth that could soon peak
 - Completion Independence Hub/catch-up from '05 hurricanes

Domestic Onshore Gas Production



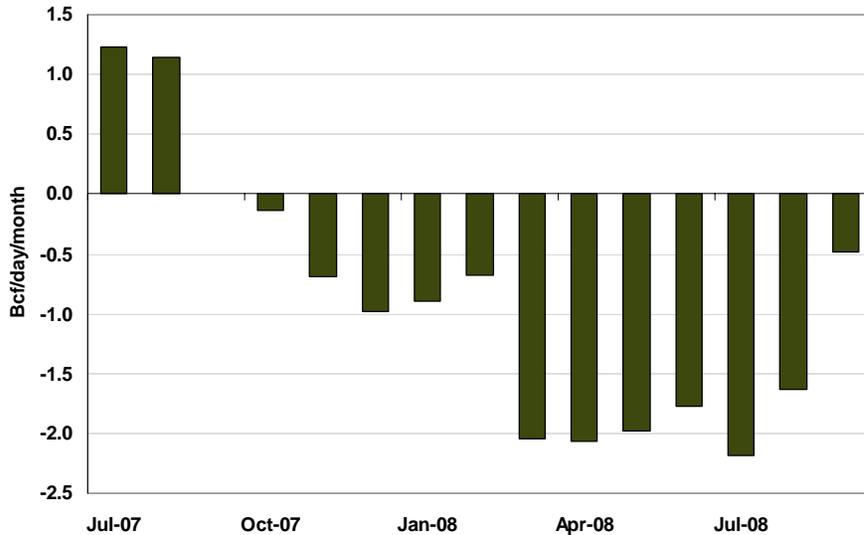
Rigs Drilling for Natural Gas



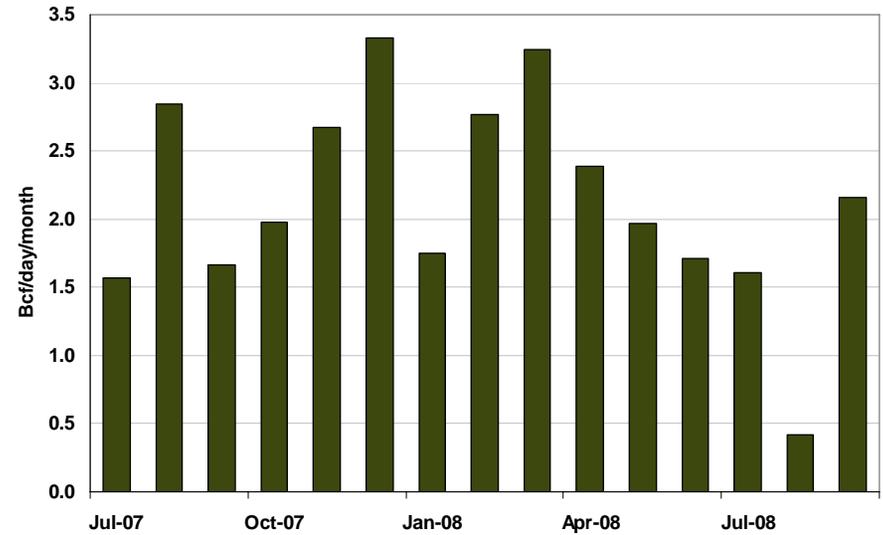
Net Increase in Supply Not as Large

- Partially offset by significant year-over-year decline in LNG imports + small decline in Canadian imports
- Since July 1st of '07, net increase U.S. supplies as average 2 to 2 ½ Bcf/day

Year-Over-Year Change in LNG Imports



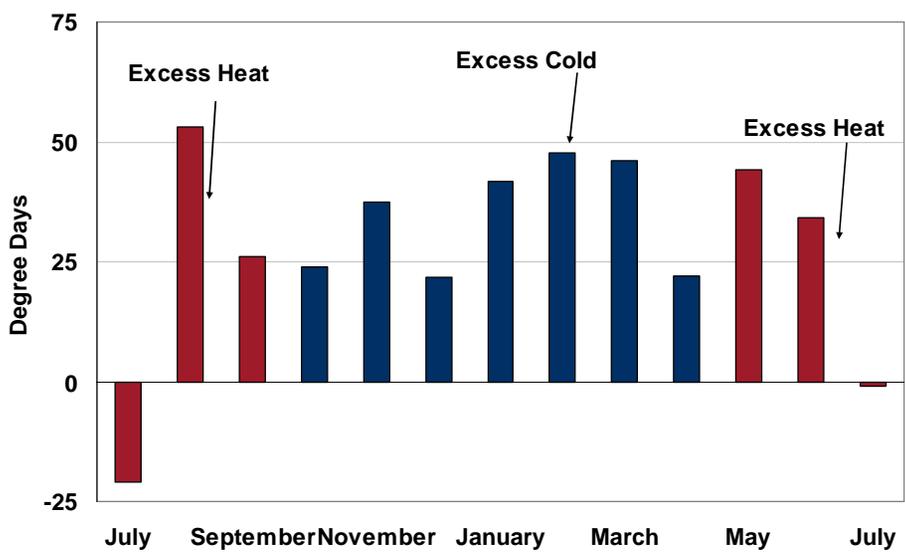
Year-Over-Year Increase in Total Supply



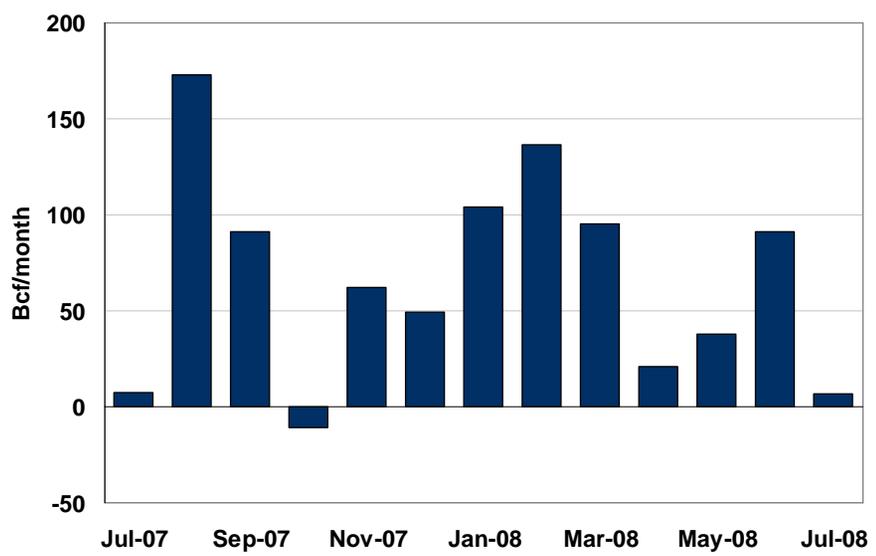
Offset by Above-Normal Weather Demand

- Offset by 13-months in which weather-driven demand almost always greater normal
 - Hotter-than-normal in air conditioning season, colder-than-normal in heating season

Monthly Degree Days vs. 10-Year Average



Monthly Weather-Related Demand vs. 10-Year Average Weather

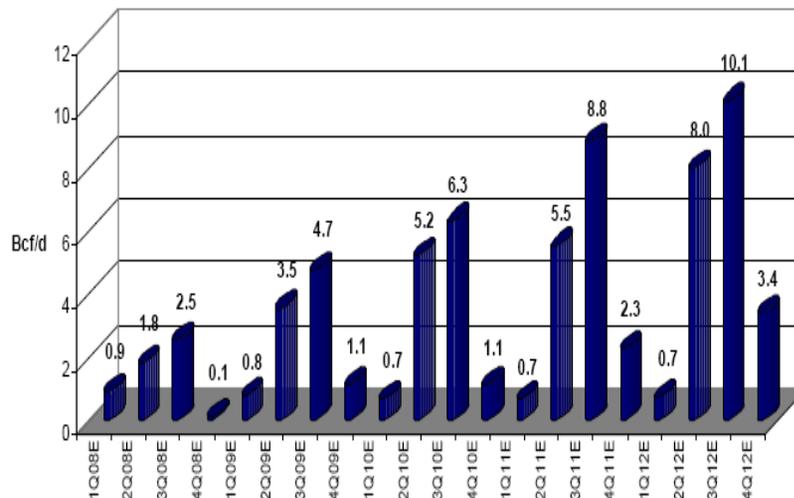


Prices Could Continue to Soften Next Year

- Depending on severity of winter, downward pressure could increase significantly next year (repeating 2001-early '02)
- Drilling cut-backs likely -- but significant impact takes time
- At same time, much of new LNG production for next decade likely to come on line soon – creating potential over-supply

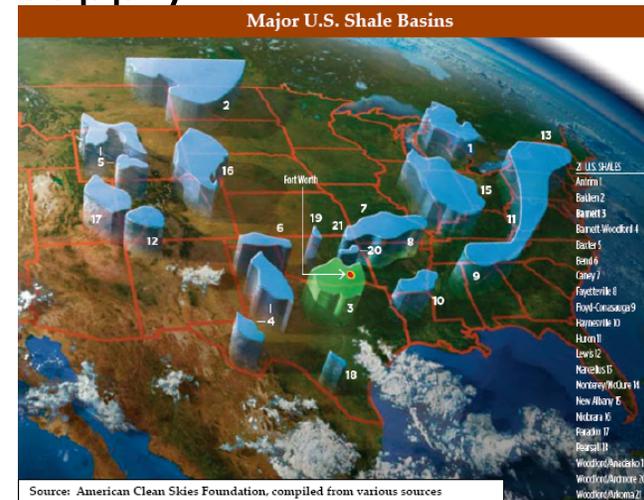
Potential Increase in LNG Imports

U.S. LNG Imports, 1Q08E-4Q12E (Bcf/d)—Highly Volatile Import Volumes



Emerging Shale Plays -- Major New Source?

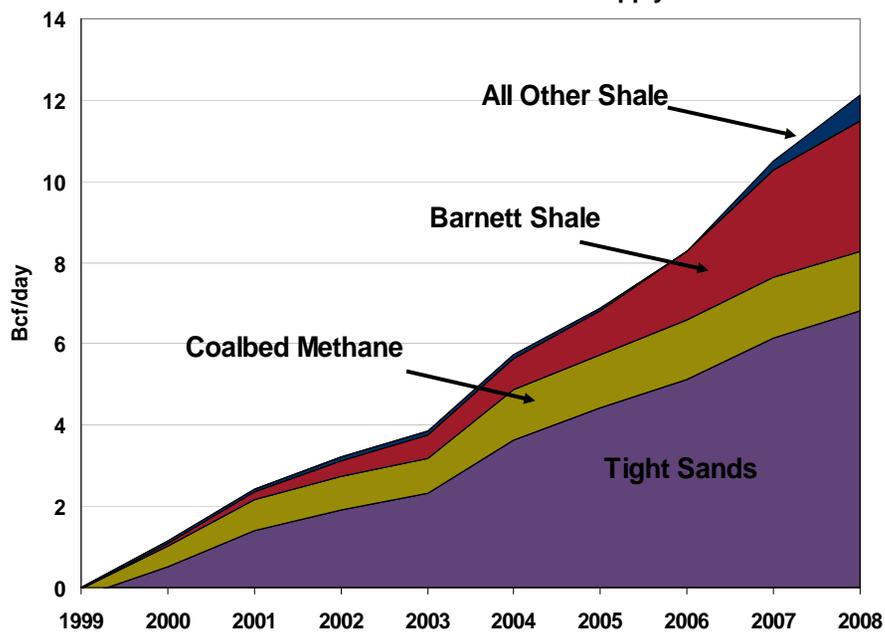
- Emerging shale plays potentially = extremely important new source
- Some recent studies suggest that, within 15 to 18 years, could add as much as 25 to 30 Bcf/day of new supply
- Already has raised fears of potential glut
- But need to keep in larger perspective
 - Potential yet to be verified
 - Many factors could limit development
 - *Perhaps sharply*
 - Other sources could decline rapidly
 - *Especially if shale development high*
- Also, U.S. nat. gas demand growth likely to be explosive
- As a result, risk of LNG dependence remains high



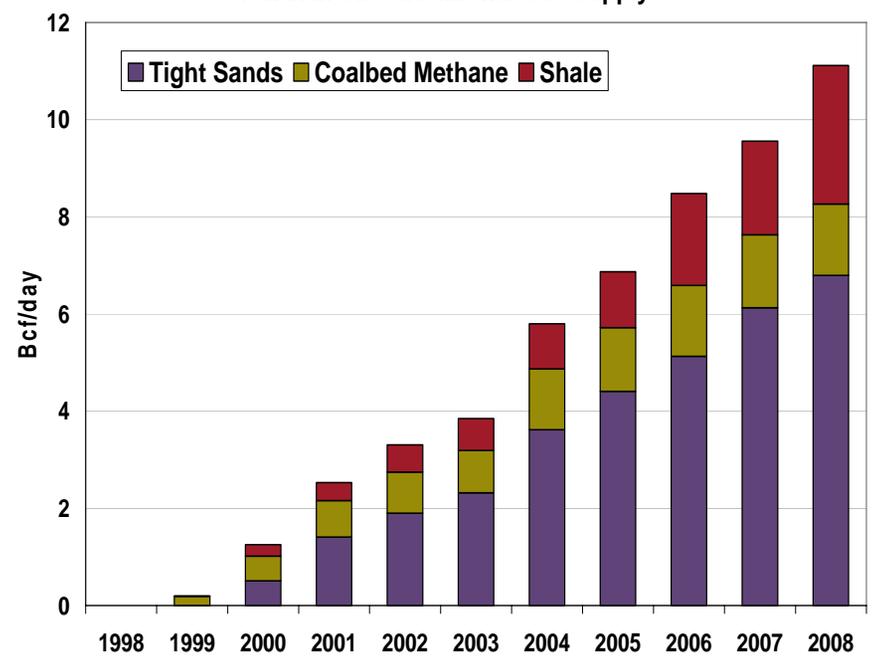
Considerable More Examination Required

- Almost all the growth in unconventional gas to date due to tight sands + coal bed methane + Barnett Shale
- Barnett Shale production could peak early next year
 - Reflects many years of development effort
 - 10 years to reach 4 Bcf/day
 - Time to scale gathering system, infra-structure, rigs & crews

Growth in Unconventional Gas Supply



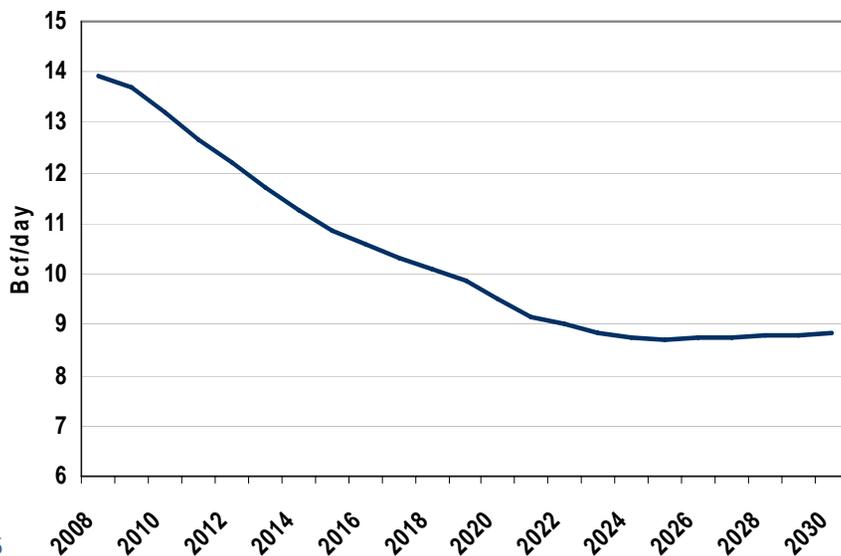
Growth in Unconventional Gas Supply



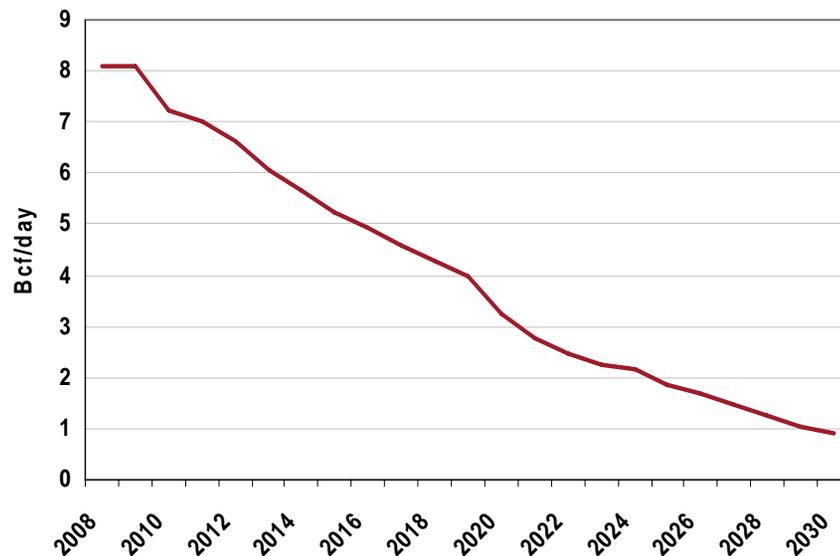
Other Sources of Supply Could Rapidly Decline

- Conventional on-shore production & Canadian imports already expected to rapidly decline
- Period of soft prices + shale potential could accelerate significantly while simultaneously moderating shale
- New deepwater projects could also slow dramatically
 - Rigs already needed elsewhere
 - Shale potential + lower cost & risks could further reduce

On Shore Conventional



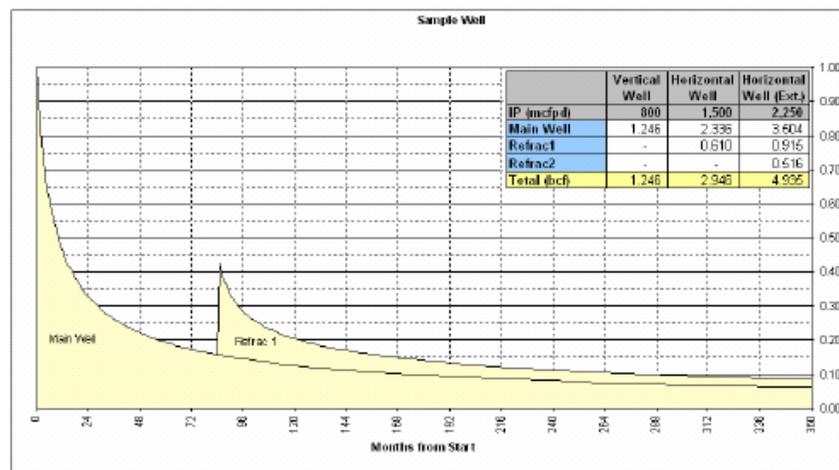
Imports From Canada



Can Barnett Shale “Sweet Spots” Be Replicated?

- Anecdotal reports suggest surge in Barnett Shale production due in part to current targets with unusually large initial production “sweet spots”
 - Declines of up to 65 % by end of 1st year
- Many projections assume slower decline

Production Profile – “Typical” Barnett Shale Well



Source: FBR Research

- Yet to be verified can be repeated in other basins – or even sustained in Barnett Shale

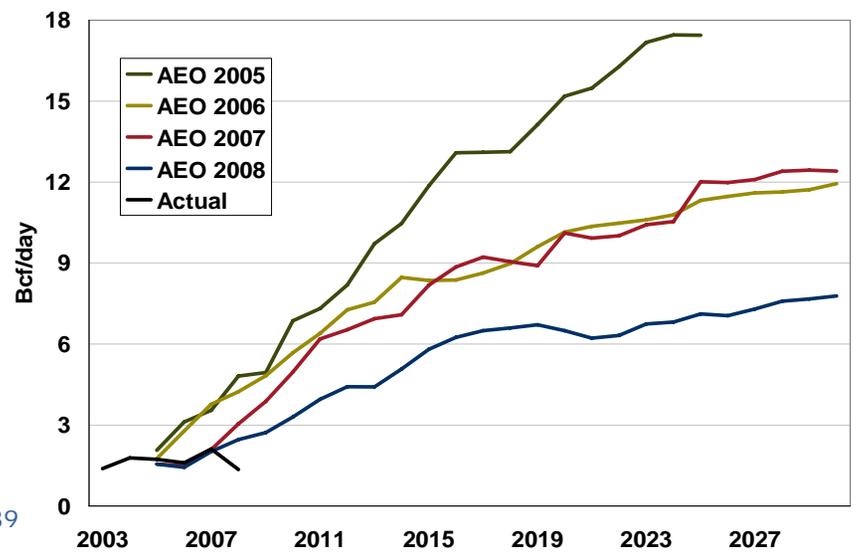
Many Factors Could Slow Shale Development

- Even if potential confirmed, huge investment *and many years likely to* be required to achieve high production levels
 - 10 years to reach 4 Bcf/day in Barnett Shale
- Moderate gas prices for next 24-36 months could significantly reduce development rate
 - Infra-structure development could be put on hold
 - Much slower ramp-up for # of wells, drilling equipment & crews
- Could then take years to catch up
- Many other potential impediments
 - Potential pipeline bottlenecks in Southeast
 - Gathering system limitations – particularly in Appalachia
 - Availability of rigs & crews
 - Lease term limitations
 - Water rights and permitting issues

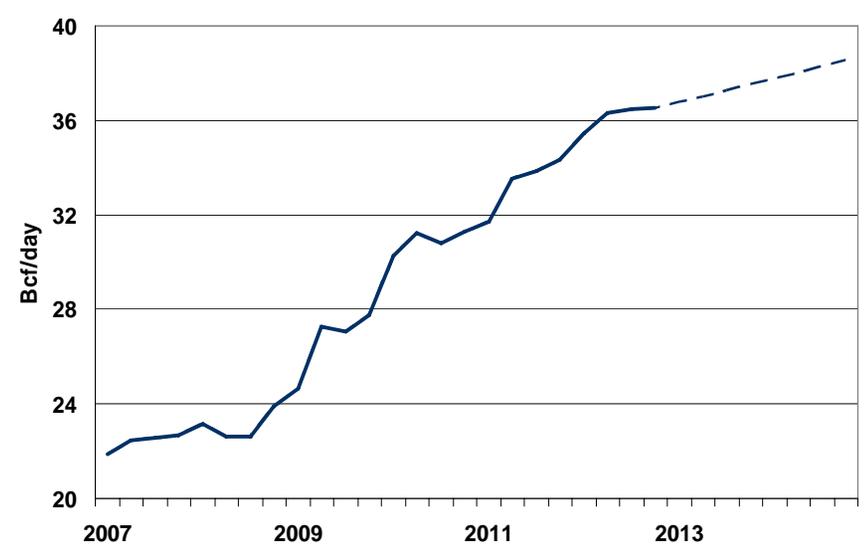
Leaves U.S. Dangerously Dependent Upon LNG

- U.S. imports & projected growth repeatedly disappoint
- Market may be briefly oversupplied in 2009 & 2010
 - Most new production next 7 -10 years on line same time
- By early next decade, global demand certain to mushroom
 - Simultaneous worldwide shift to gas to reduce CO2 & diesel power
- Growth in supply certain to level off
 - 7 to 10 year-lead time; remarkably few projects in queue

EIA Import Projections Decline Every Year

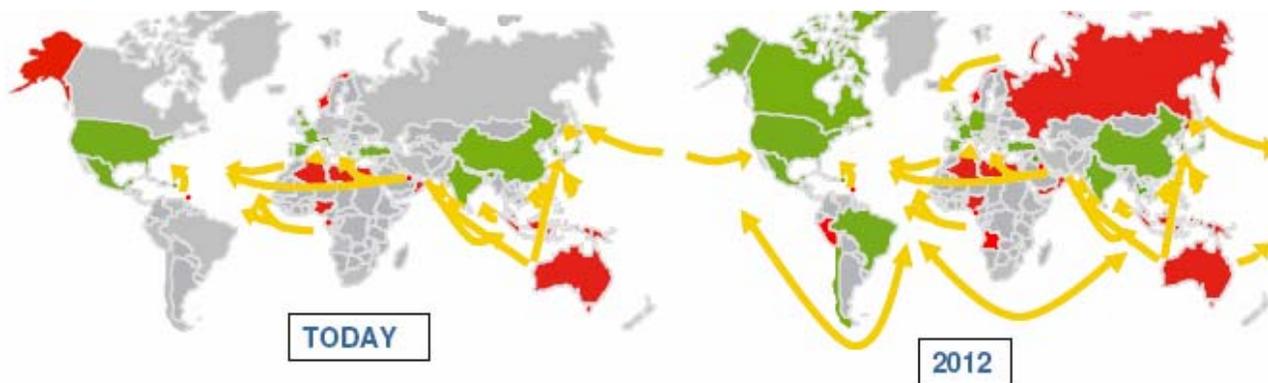


LNG Production Expected to Plateau



U.S. Could Be Caught in a Vice

- Only limited number of major liquefaction projects underway
 - Minimum 7 to 10-year lead time; limited # of sites
- But # of importers and potential demand is exploding
- Virtually guarantees global LNG shortage by no later than 2012



■ LNG importers
■ LNG exporters

# Countries	TODAY	2012	% increase
LNG importers	17	29	70.6%

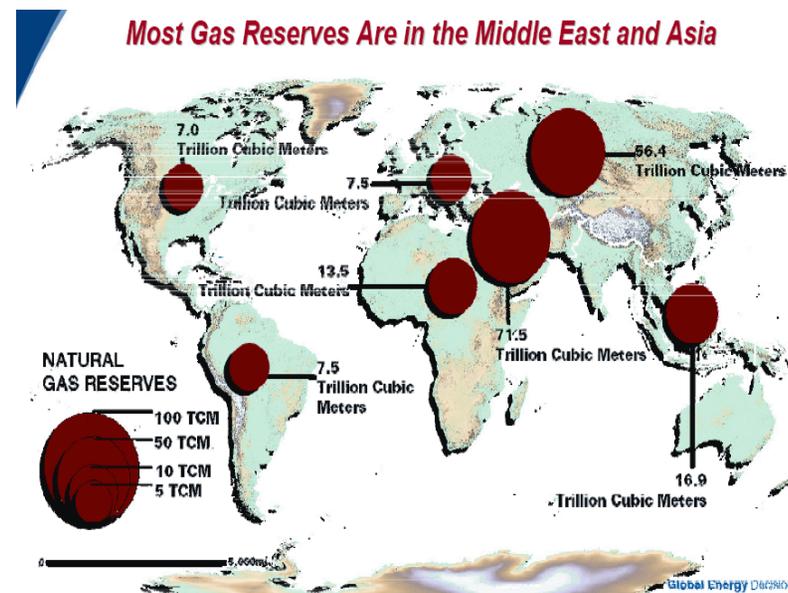
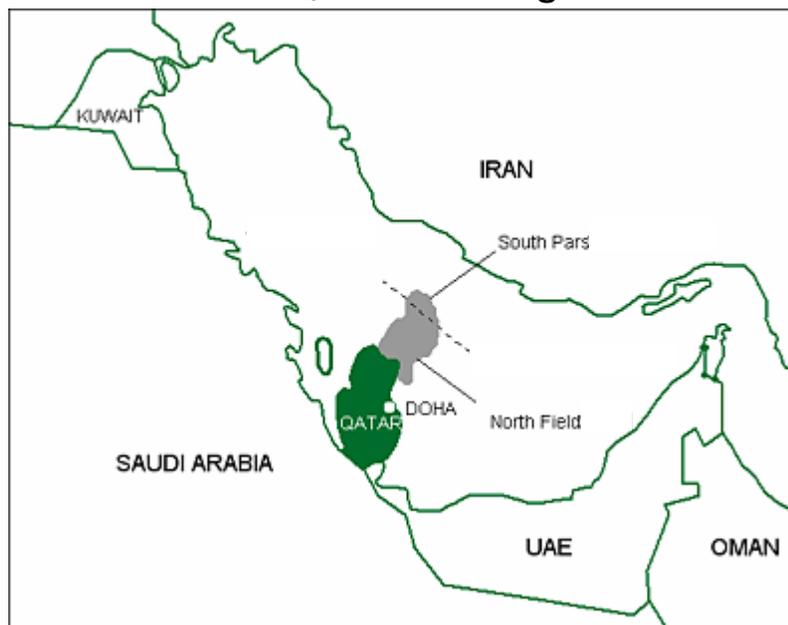
Shell analysis



Geopolitical Risks Huge

- From a geo-political standpoint, difficult to imagine a less desirable source of fuel
 - Would end 30 years of reliance almost entirely on North American fuel supplies to satisfy U.S. demand for electricity

Primary Source of Supply =
Persian Gulf, Russia & Nigeria

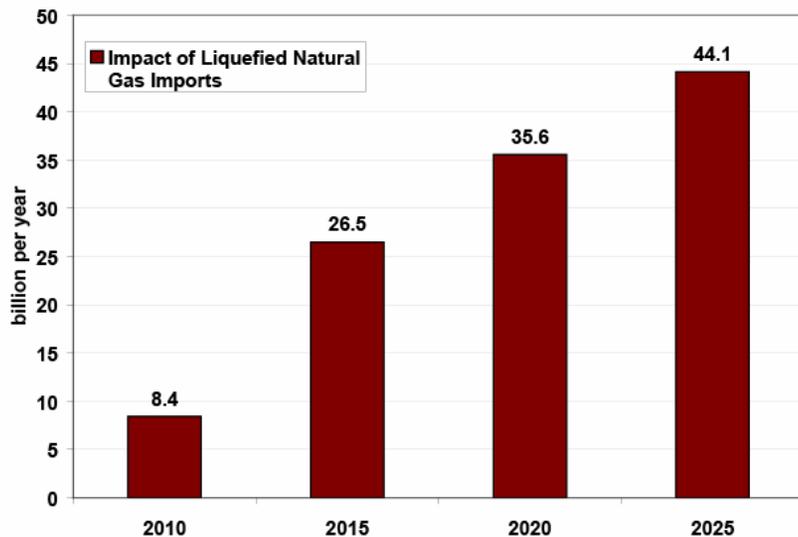


LNG is a Global Commodity, Priced Off of Oil Benchmarks

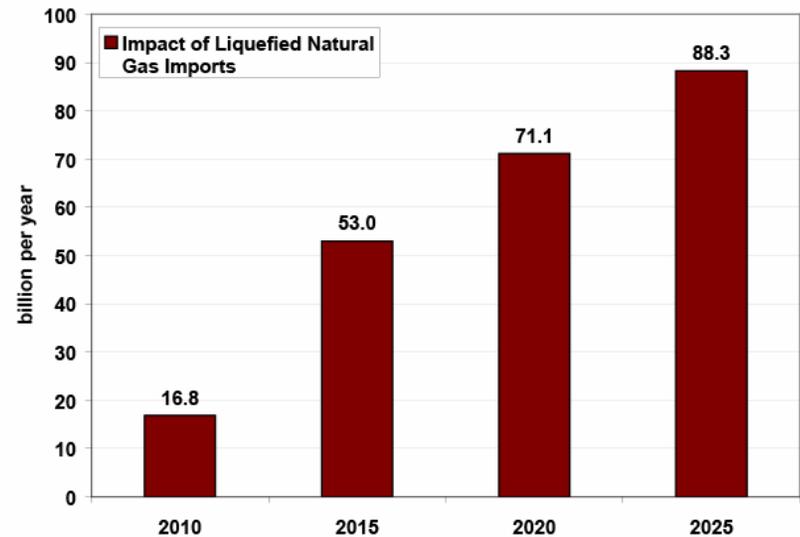
Major Addition to Balance of Payments Deficit

- Impact on balance of payments deficit could be brutal
 - Even if imports ½ EIA’s assumed levels
 - No different than imported oil

Potential Cost to Balance of Payments if LNG imports are half of EIA projections



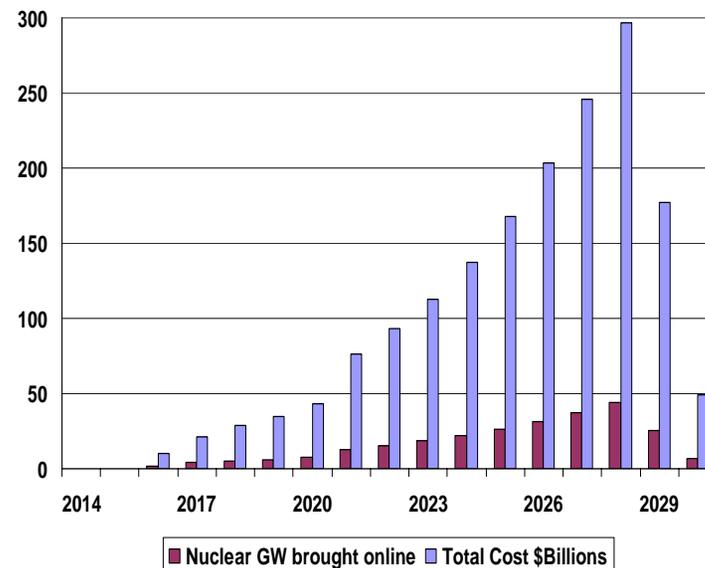
Potential Cost to Balance of Payments if LNG imports meet EIA projections



Scaling Nuclear Rapidly Poses Huge Challenges

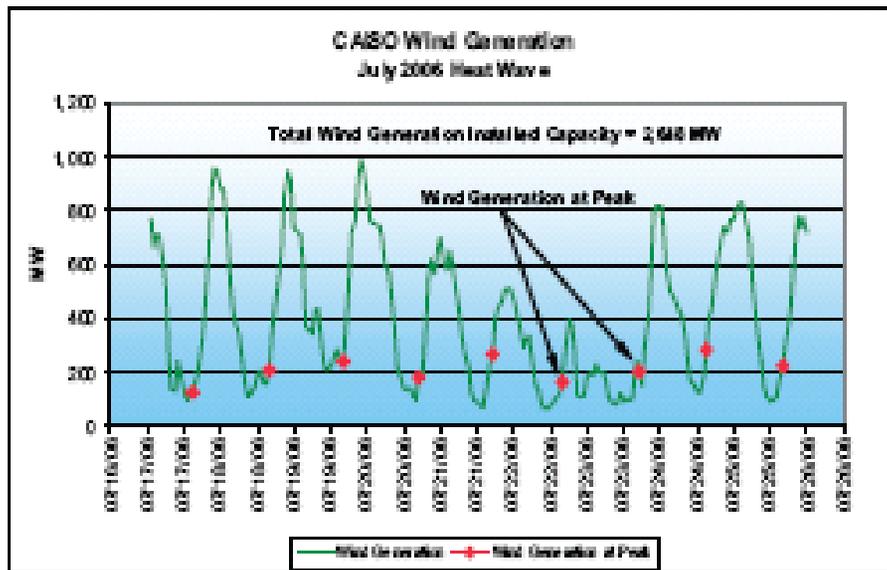
- Unlikely to make major contribution before 2025 or later
 - Time to license & build 1st new plants still uncertain
- Recent cost projected cost increases startling
 - Estimates as high as \$ 14 to 22 billion for 2-unit plant
 - Price/kwhr could be prohibitive -- especially if gas appears adequate
- Capacity to fabricate key components limited
 - Others already 1st in line
- Personnel could be even more severe limiting factor
- Cost for just 5 to 10 projects could exceed capital budget for entire industry

Potential Multi-\$ Trillion Cost



Wind Also Not Likely Near-Term Panacea

- Huge long-term potential – with sufficient capital
- Even most aggressive study: share of total U.S. electricity in 10 years remains small
 - Also not yet demonstrated cost effective at \$ 1 trillion +
- Availability of transmission can pose major barrier
- But primary constraint: availability often near-zero during periods of peak demand



Source: Cal ISO, Integration Of Renewable Resources, Nov. 2007 Study

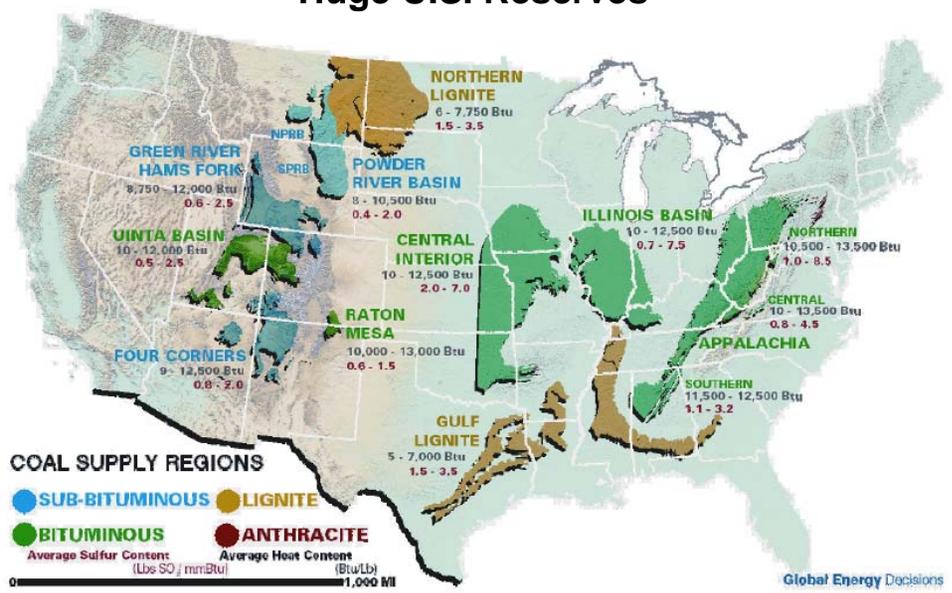
Developing Cost Effective Storage Key

- Key: technology to store output cost effectively on large scale
- Absent storage, cost prohibitive as means of serving load
 - Must build two generators to same load – one wind, one fossil
 - May take 15 years or more to develop & deploy on large scale
- Until then, can be used cost effectively to displace natural gas on limited basis
- As share of load increases, cost-effectiveness plummets
- Recent Cal ISO study suggests that at 7 % of load, incremental cost prohibitive
 - Even in 2nd most gas-dependent state in U.S.
 - 7 % wind equates to 20 % RPS in California, due partly to high levels of geothermal in state

Potential Benefits of Coal Difficult to Dispute

- Abundant resource: U.S. = Saudi Arabia of coal
 - 250 billion tons of recoverable reserves (27 % of world's total)
 - Equivalent to > 500 years of current Mid-East oil imports
- Can be developed at reasonable cost
- New facility emissions of regulated pollutants very low
 - Must comply with "Best Available" control technology requirements

Huge U.S. Reserves



Potentially Breaks Grip of LNG

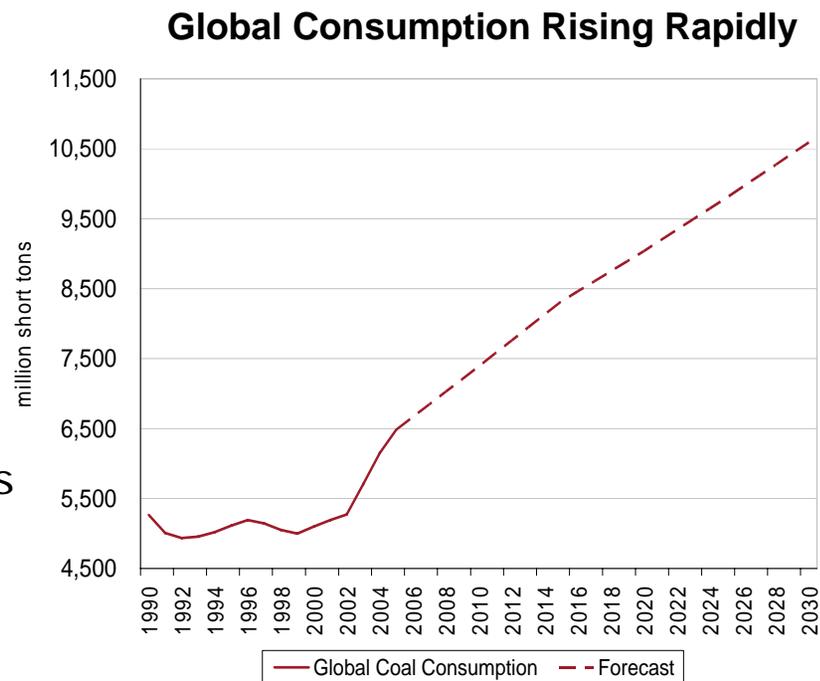
- Even with Carbon Capture & Storage, likely to be far less expensive than LNG priced at parity with or premium to crude
 - Cost difference could = trillions of dollars over time
- Could play pivotal role in providing U.S. with more reasonably-priced electricity and natural gas than many other countries
 - > 50 % of total U.S. energy use
- Would help to keep increases in demand for natural gas to generate electricity to more reasonable levels
- Simultaneous expansion of shale could help to seal the deal
 - Potentially could free up large amounts of natural gas for industrial use + CNG
- Could provide competitive advantage for U.S. manufactures – helping to bring large number of jobs back into U.S.

Oil Reduction Benefits Potentially Even Greater

- Aggressive deployment of coal-to-liquids + electric plug-in hybrids could achieve huge oil import reductions
 - 2-3 million barrel/day reduction may be feasible 10-12 years
- Potentially could permanently cap price of gasoline + major source of feedstock for industry
- Could have major impact on balance of payments
- By reducing U.S. demand for imported gas, could even help to reduce Russian leverage over Europe
- Doesn't prevent or impede efforts to aggressively increase energy efficiency
- Instead, the more U.S. energy consumption is reduced, the greater these benefits become
 - More energy consumption reduce, more rapidly oil imports reduced, energy costs lower & economy re-energized
 - More rapidly Russian leverage & dependence on Middle East fall

What = “Right Way” to View Sequestration?

- Universal recognition issue is carbon capture & storage
 - If successful, becomes low-CO₂, low emitting source of energy
 - Cost effectiveness depends upon cost for competing supply options
- 2007 MIT “Future of Coal” study concludes “no apparent obstacle” to implementation
 - But not yet commercially demonstrated & many question
- Difficult to understand or defend *not* attempting to aggressively develop & test
 - Jeffrey Sachs, Columbia U. Prof. & Advisor to Kofi Annan condemns as “immoral” *not* to go forward
- Under any plausible scenario, global coal use will increase
 - Projected > 2 billion tpy increase
 - Can’t achieve aggressive CO₂ reduction goals without

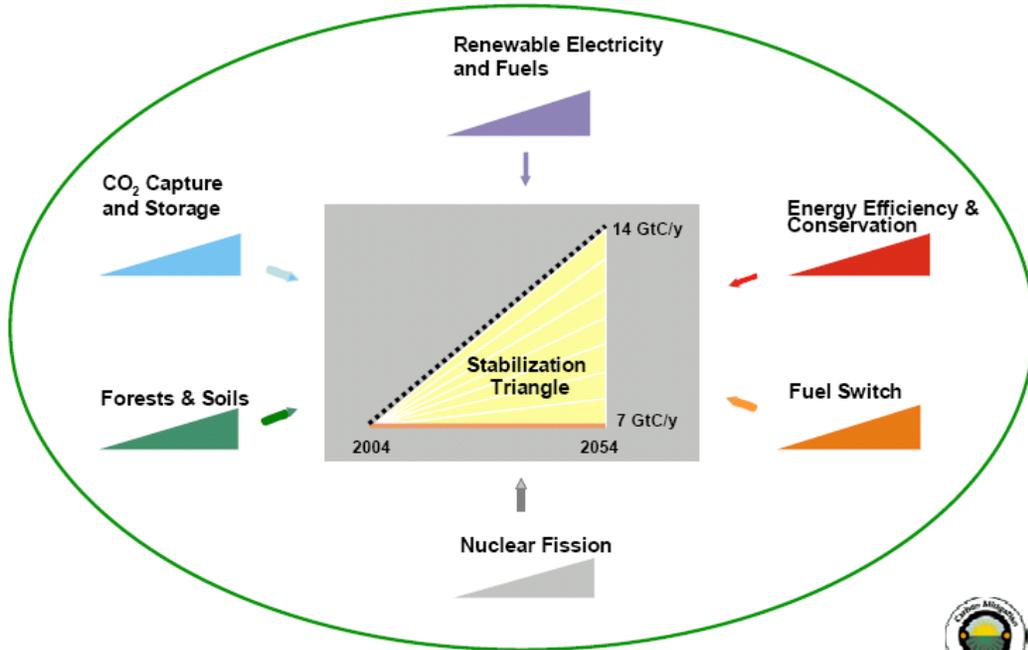


Source: EIA, IEA

Can Be Major Component of Global Reductions

- Robert Socolow, Daniel Schrag & others have been emphasizing for years
 - Inexcusable not to act
 - Illustrates results of lack of comprehensive planning

Fill the Stabilization Triangle with Seven Wedges



Source: Dr. Robert Socolow, Princeton University



Does Peak Oil Concern Require Action?

- Can't afford to fall short of meeting energy supply needs
 - True shortages will lead to unprecedented price increases
- 18 months ago U.S. & global economy appeared robust
- Few saw severity of sub-prime crisis coming
- Energy crisis is different: imbalance between available supplies & global needs predictable
 - Only evidence to contrary = paper projections without solid foundation
- Solutions still possible
- But realism essential
- No time to waste
- Future on the line

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