

Clean, Abundant, Affordable, American Natural Gas



Johns Hopkins SAIS Panel
September 16, 2009
Washington D.C.

Empowering America

American Natural Gas Alliance (ANGA)



Comprised of 28 of the largest public independent U.S. natural gas producers, formed in Q1 2009

Objective: Demand enhancement through:

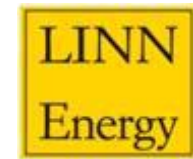
- Brand and image enhancement messaging
- Supply abundance studies to support policy/business decisions
- Key demand drivers (power generation & transportation)
- Coalition building
- Climate change and RPS debates
 - Carbon regulation (tax vs. cap & trade);
 - Downstream POR is key to supply growth
 - Ability to contain costs critical to passage
 - At today's nat gas prices carbon tax of >\$13 favors nat gas generation
- Will soon be inviting smaller publics and privates to join us



For the first time ever the E&P industry is getting serious about stimulating demand for our product - \$100 mm per year!

ANGA – American Natural Gas Alliance

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Natural Gas Today

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- **The U.S. consumes more than 60 billion cubic feet (bcf) of natural gas per day, the energy equivalent of 10 million barrels of oil per day (equal to 53% of U.S. oil consumption)**
 - 90% of natural gas consumed in the U.S. comes from U.S. wells, about 8% from Canada and 2% from liquefied natural gas (LNG)
 - U.S. natural gas consumption consists of: one-third electricity usage, one-third industrial usage; and one-third residential and commercial usage
- **U.S. oil consumption is about 19 million barrels of oil per day, 65% of which is imported**
 - Today, oil costs about \$70 per barrel, and natural gas costs about \$3.50 per mcf
 - 6 mcf of natural gas provides the energy equivalent of one barrel of oil
 - So, U.S. natural gas today is the equivalent of \$21 per barrel of oil equivalent, or 70% cheaper than oil
- **40% of U.S. natural gas production is produced by public independent producers, such as Chesapeake; 40% is produced by private independent producers, and 20% by the “major” companies like ExxonMobil. (Note: An “independent” company is one that one drills for and produces natural gas and oil and does not engage in refining or marketing like a “major” company does.)**

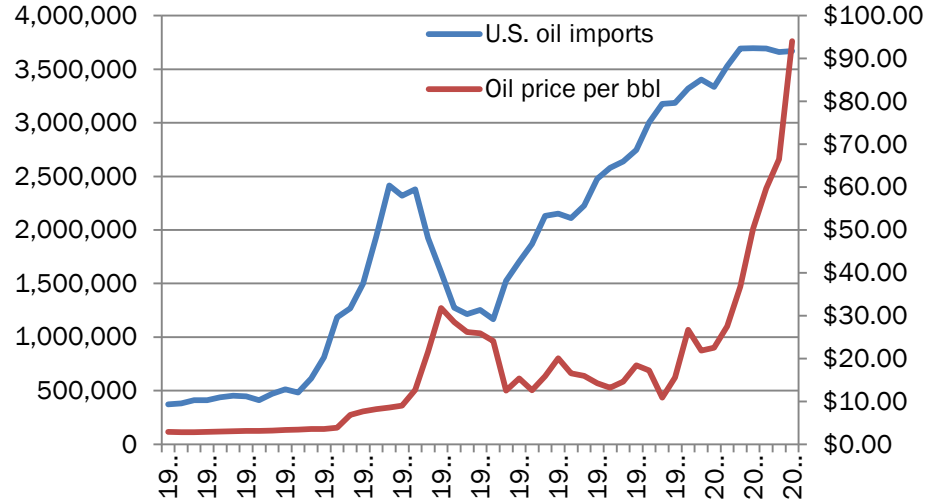
Natural Gas: An American Home Run



- **The U.S. produces 35% of its own oil, but 90% of its own natural gas**
 - U.S. natural gas production is about 25% of the world’s natural gas production
 - U.S. oil production is about 6% of the world’s oil production

- **The U.S. is doomed to long-term decline if we do not find a solution to our rising oil dependency**

TOP WORLD NATURAL GAS PRODUCERS, 2008		
RANK	COUNTRY	DRY NATURAL GAS PRODUCTION (Bcf/Day)
1	Russia	64
2	United States	56
3	Canada	16
4	Iran	11
5	Norway	10
6	Algeria	8
7	Netherlands	8
8	Saudi Arabia	8
9	Qatar	7
10	China	7



Natural Gas Abundance: What Does It Mean?

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- **Natural gas has always been regarded as a superior product because of its clean and simple molecular structure – four atoms of hydrogen for every one atom of carbon**
 - Coal and oil cannot compete with natural gas: Coal is almost pure carbon (over 90% by weight); oil products contain well over 80% carbon by weight
 - On a carbon-per million Btu basis, natural gas is about 40% lower than coal and 25 to 30% lower than oil products
- **However, new natural gas reserves were considered relatively scarce until the discovery of the shale gas plays of the past few years: the Barnett, Fayetteville, Haynesville and Marcellus Shales**
 - The new shale plays help provide the U.S. with a more than 100 years supply of natural gas
- **This new natural gas abundance allows the U.S. to: (1) drastically reduce CO₂, particulate matter and mercury emissions by scaling back coal consumption (the United States uses 150% more coal-fired generation than natural gas-fired generation); (2) reduce dependence on foreign oil by converting portions of the transportation fleet to natural gas vehicles (NGVs); (3) enhance national security by reducing wealth transfer from U.S. to oil exporters (4) create new clean-energy jobs with natural gas drilling and production (5) reduce balance of payments deficit**

Natural Gas: The Cleanest Fuel of the “Big 3”



Fossil Fuel Emission Levels

Pounds per Billion Btu of Energy Input

Pollutant	Natural Gas	Oil	Coal	The Natural Gas Advantage
Carbon Dioxide	117,000	164,000	208,000	44%
Carbon Monoxide	40	33	208	81%
Nitrogen Oxides	92	448	457	80%
Sulfur Dioxide	1	1,122	2,591	99.9%
Particulates	7	84	2,744	99.7%
Mercury	0.000	0.007	0.016	100%



Chesapeake: Leading the Search for Reliable, Affordable Natural Gas Supplies

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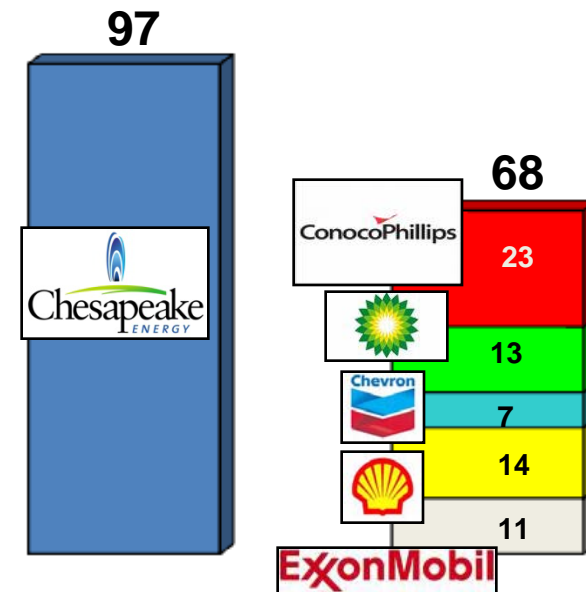
Most active operators in the U.S.

(Independents in green)

Rank	Company	Rig Count
1.	Chesapeake	97
2.	XTO	50
3.	EOG	37
4.	EnCana	29
5.	Anadarko	25
6.	ConocoPhillips	23
7.	Devon	20
8.	Newfield	20
9.	PetroHawk	18
10.	Southwestern	15
Subtotal: Top 10		332
Total U.S.		985

Chesapeake vs. The 5 "Majors"

Active U.S. Onshore Rigs



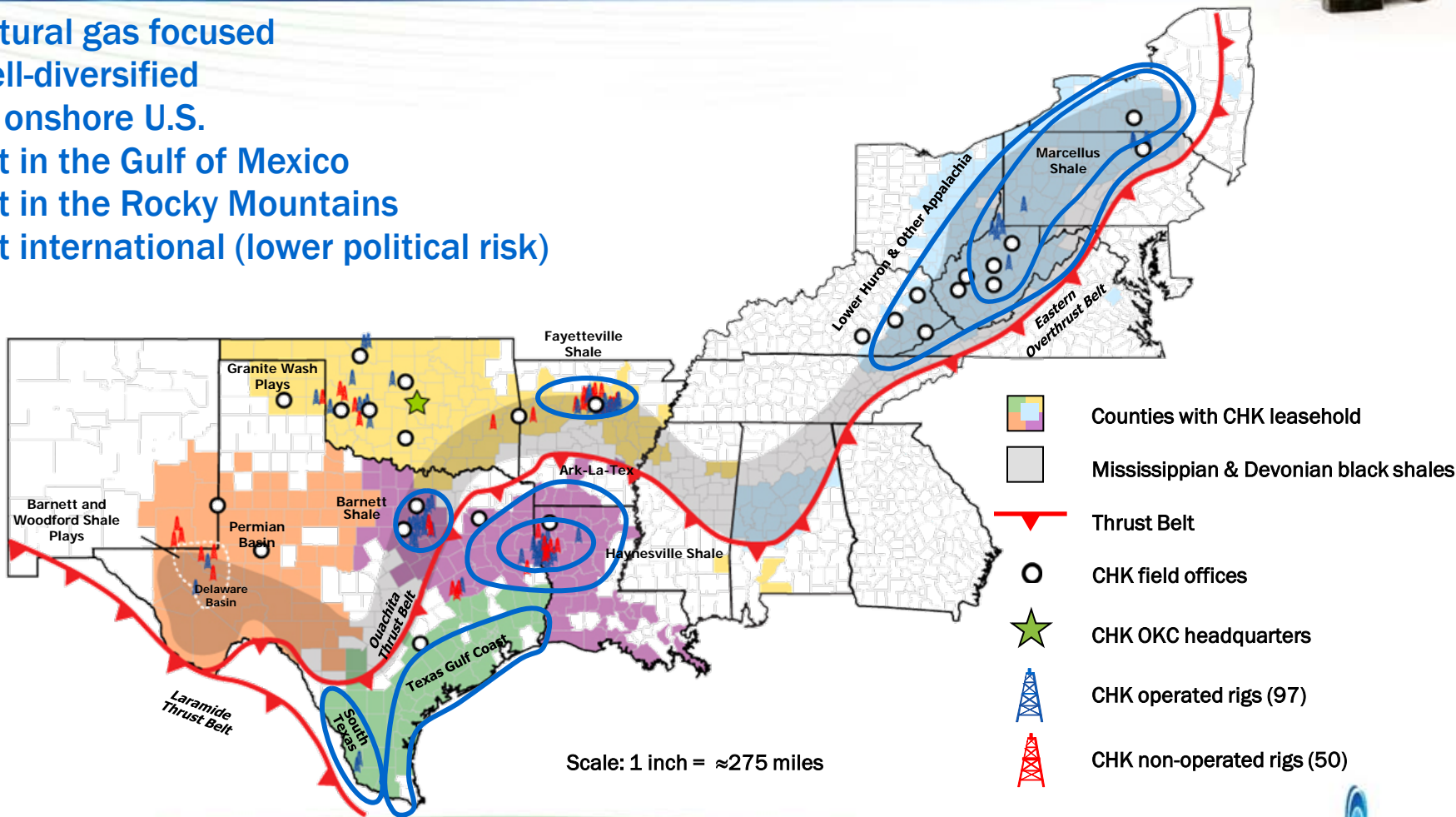
The independent producers like CHK are leading the way in the search for clean U.S. energy, not the "majors."



100% All-American CHK Activity



- Natural gas focused
- Well-diversified
- All onshore U.S.
- Not in the Gulf of Mexico
- Not in the Rocky Mountains
- Not international (lower political risk)



Deep Gas Shales – An Energy Revolution

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- Deep natural gas shales – located abundantly throughout the U.S. – provide a vast new clean energy resource to meet consumer needs
- The natural gas is embedded in rock several miles underground compacted over hundreds of millions of years
- Immense reserves are spread uniformly over large geographic areas not previously economic to develop since ill-suited for conventional vertical wells, which was still the dominant industry drilling method just two years ago
- But a drive to find new supplies has led to break-through development technologies for shales
 - Rapid shift to horizontal drilling plus greatly enhanced hydraulic fracturing techniques to break free gas from these impermeable and non-porous formations
- It is now possible to drain natural gas from a 3.5 million sq. ft. area (80 acres) with a single new well, profoundly improving shale economics



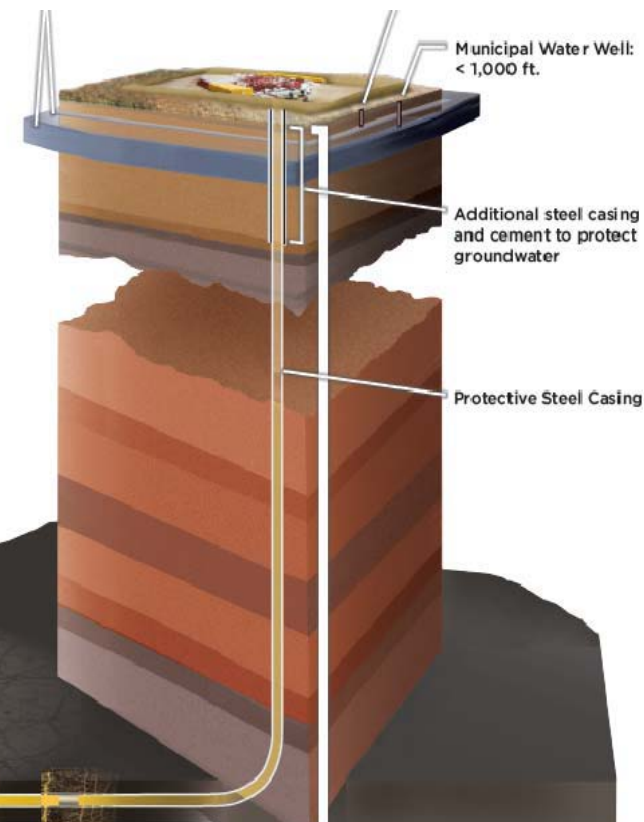
CHK and Independent Producers Led the World's Energy Industry in Making This Discovery!

Deep Shale Gas Abundance is a Result of American Technological Innovation

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- Natural gas exploration is in a constant process of technological enhancements; new state-of-the-art equipment is leading the way to dramatic supply growth
- Hydraulic fracturing, a proven method safely used by exploration companies for more than 50 years, occurs 1-2 miles below the surface under impermeable rock
- Freshwater aquifers are isolated and protected by steel and concrete casing liners to prevent any detrimental interaction with drilling fluids

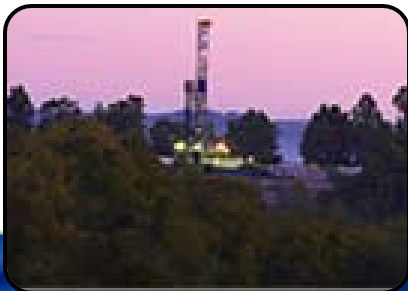
Horizontal drilling advances have led to reduced surface footprint with multiple wells drilled from same location



Shale Fractures

*not to scale.

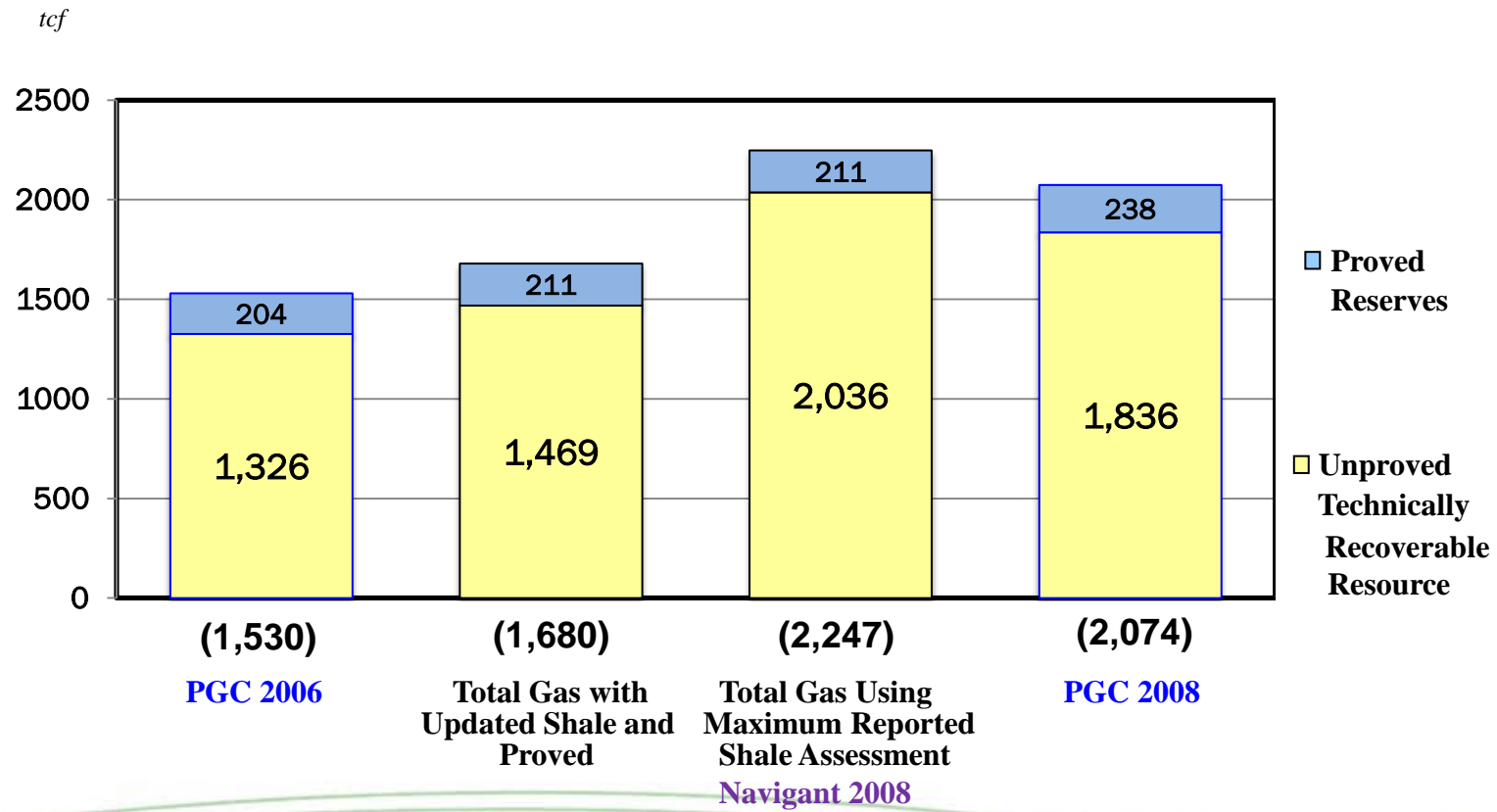
Average approximate distance from surface: 8,000 feet (1.5 miles)



Energy Experts Confirm the U.S. Has an Abundant and Growing Supply of Clean Natural Gas



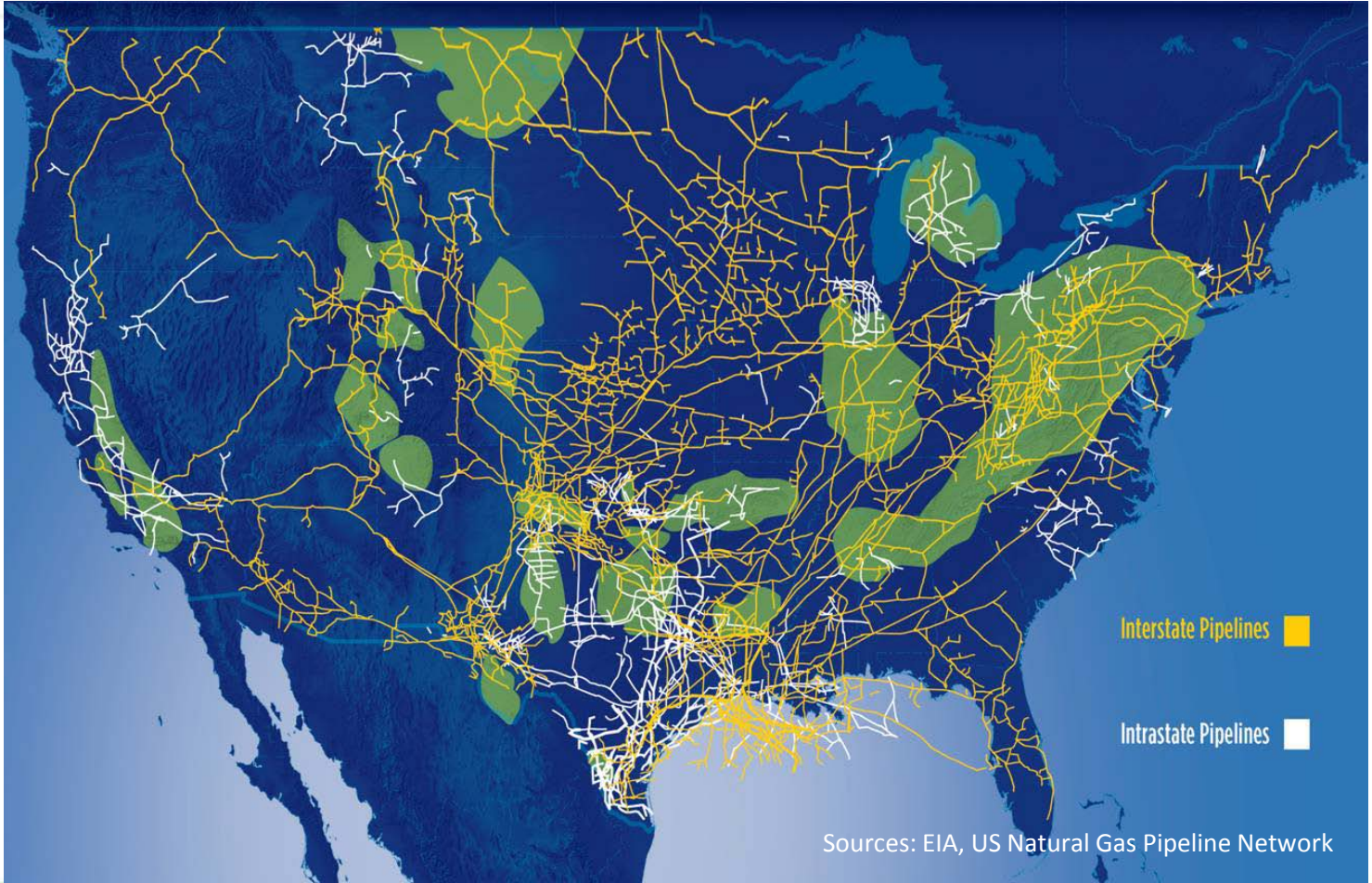
U.S. Total Gas Supply (Tcf)



Combination of Existing Pipelines and Shale Resource Base Will Accelerate Scalability & Deliverability



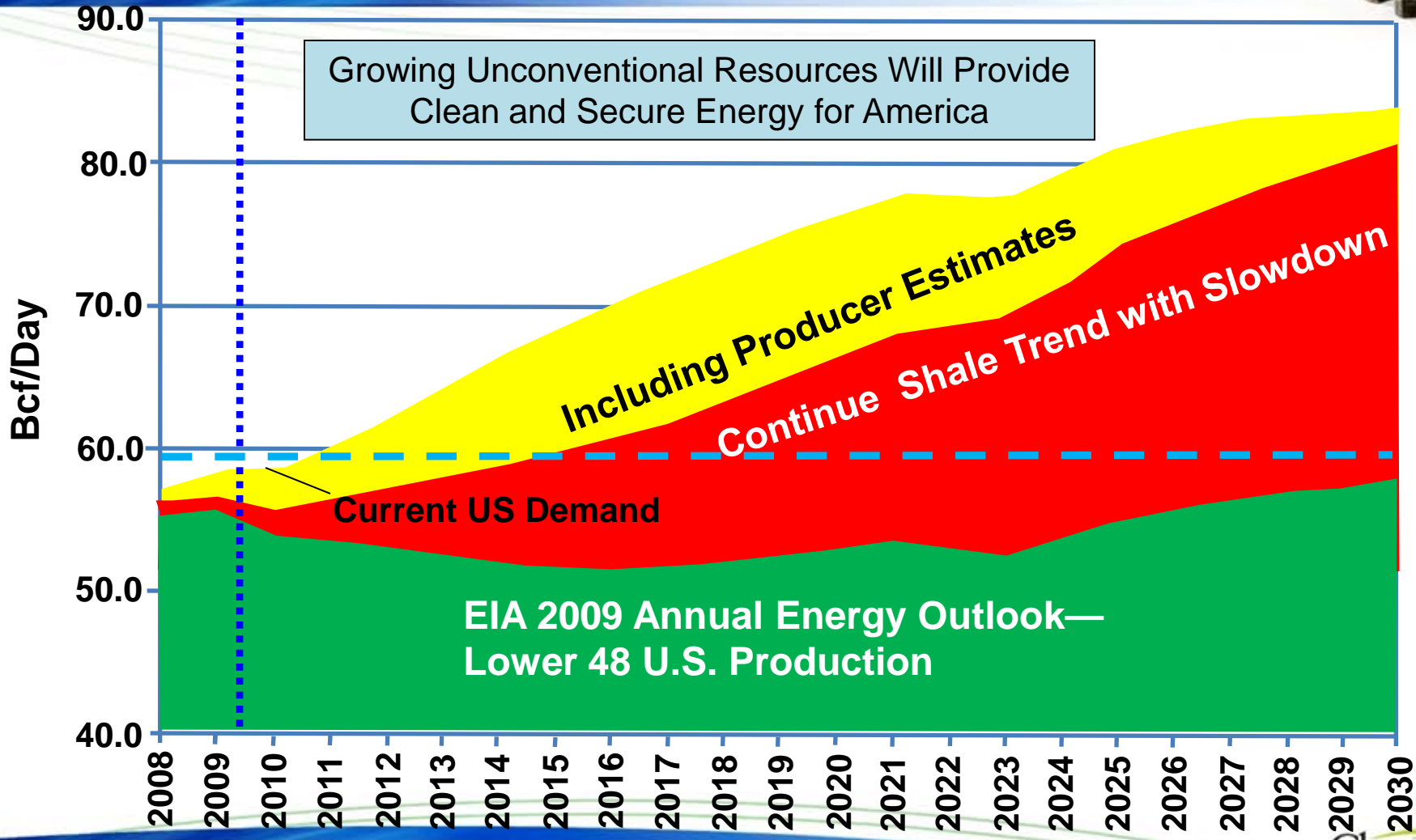
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The Highway for Clean Energy Distribution Already Exists:
No New Transmission Lines or Corridors are Needed



Even the Most Conservative Natural Gas Production Projection is Dramatic



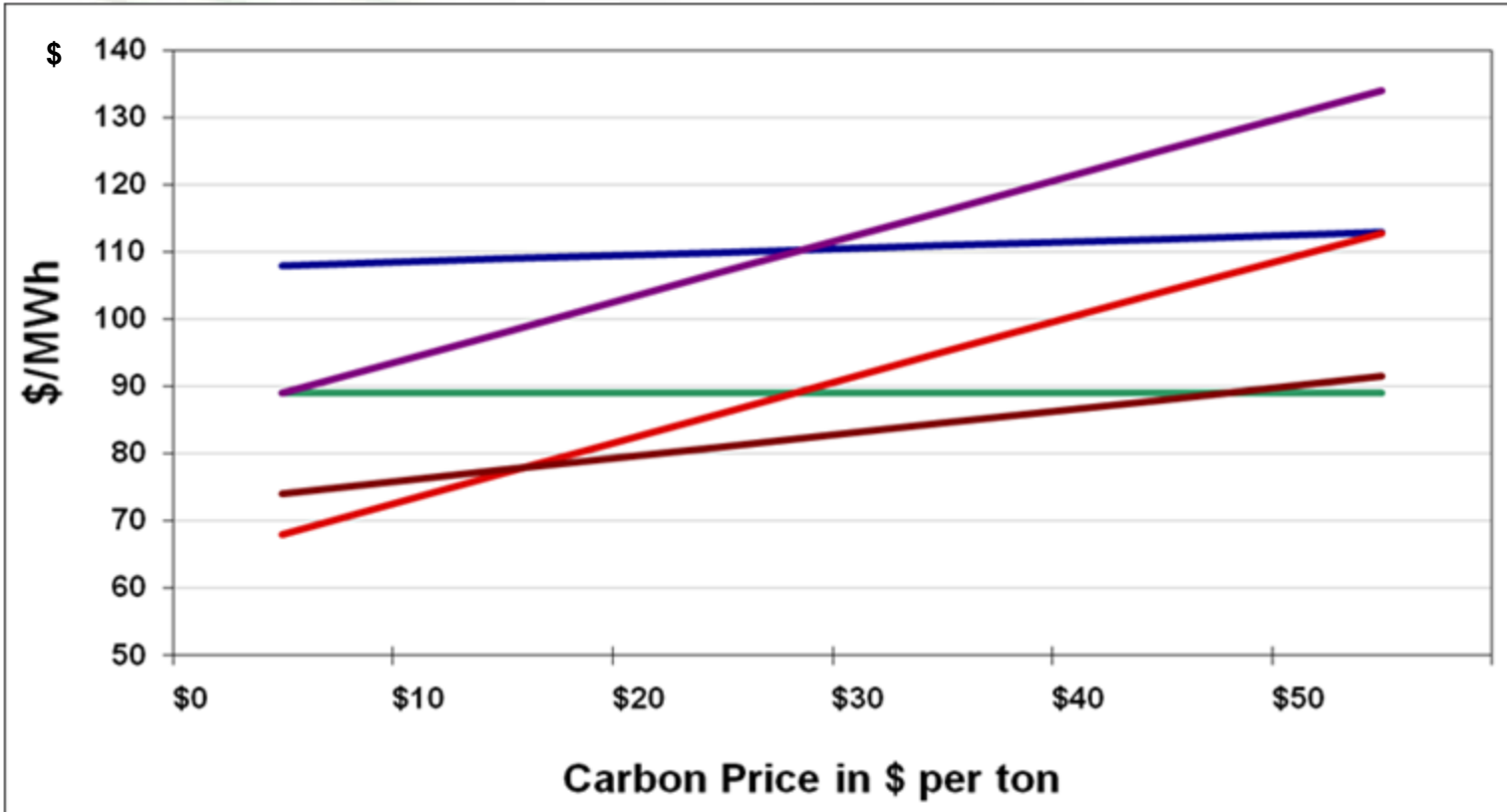
Source: Navigant 2009



Pricing Carbon – The Details Matter



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- Coal IGCC
- Pulverized Coal
- Coal IGCC w/CCS
- Natural Gas CC
- Nuclear



The Objective Is CO₂-Emission Reduction and Cost-Containment; The Answer is U.S. Natural Gas



- Coal-fired plants emit 1,980 million tons/year of CO₂ – 82% of total power plant emissions; moreover, coal-fired plants account for more than 33% of nation-wide CO₂ emissions covered by Waxman-Markey
- The most immediate and efficient way to reduce CO₂ emissions and improve our environment is by increasing natural gas power generation in existing plants and shutting down old, dirty “clunker” coal power plants

“One of the easiest, and most likely, ways to meet aggressive, short-term emission reduction targets, such as those in the draft bill, is through fuel switching from coal to natural gas in the power sector”

- *Dow Chemical Company 7.7.09*

- Most critical step is to rapidly increase currently underutilized combined cycle natural gas units
- **1/3rd of total U.S. generating capacity**
 - Ultra-efficient and far lower CO₂ -emitting than coal
 - Currently operate at an average capacity factor of less than 35%*(FTI)
 - Increased capacity utilization could result in billions of cost savings over new plant construction & carbon sequestration

*FTI Consulting, Inc – Washington, DC

U.S. Foresees a Thinner Cushion of Coal Reserves Wall Street Journal – June 8, 2009

"We really can't say we're the Saudi Arabia of coal anymore," says Brenda Pierce, head of the USGS team that conducted the study



The Objective Is Clean, Affordable U.S. Energy: The Best Solution Remains Natural Gas

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- A climate-change bill can achieve goals more quickly and more cost-effectively by focusing on domestic natural gas supply
- Problems with Waxman-Markey:
 - Giveaway of 85% free allowances – 35% of allowances to electric utilities – largely based on a utility's past emissions, which favors coal
 - Free allowances to coal-fired merchant generators but not to natural gas-fired merchant generators
 - Proposed \$60 billion government spending on Carbon Capture and Storage (CCS) just to try and make a declining dirty resource as clean as natural gas is already
 - Cut-back of 2020 reduction goals from the discussion draft, which reduces near-term incentives for use of low-carbon fuels, such as natural gas
- A large number of free allowances for the utility sector will effectively shift much of the near- to mid-term compliance costs onto other sectors, especially the transportation sector, although bill lacks true incentives for boosting natural gas vehicles (NGVs) – a clean, low-cost, American answer for lower CO₂ emissions and foreign-oil's stranglehold



Natural Gas Remains Today's Best Clean, Domestic, and Scalable Answer

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- Through the development of supportive legislative policy, natural gas supplies could increase by 50% by 2020
- Through increased usage of clean-burning U.S. natural gas, GHG emissions from power generation sectors can be reduced significantly by 2020 and save billions on investments in carbon sequestration costs
- Increased U.S. natural gas production can reduce reliance on foreign oil, and diminish emissions by 30-70% in the transportation sector
 - Support the NAT GAS Act for clean transportation solutions in our urban areas
- Natural gas exploration will provide significant job opportunities, royalty distribution, and economic development in many economically depressed parts of the U.S.
 - Current budget proposals will put U.S manufacturers at decided disadvantage against foreign competition

