THE GREAT PROMISE OF NATURAL GAS IN AMERICA

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Natural Gas:
The Near-Term Solution to America's Energy Crisis

Abundant

By August of 2008, natural gas production was up 8.6% over the level reached in the first 8 months of 2007. Proven reserves grew 13 % in 2007, to a level of 237.7 Tcf. New "shale" gas discoveries have greatly expanded supply. According to a recent Navigant study, the U.S. is now projected to have 118 years of supply at 2007 production levels.

American

North American production meets about 99% of the U.S. demand for natural gas. The industry leaders are mostly all American independent producers. U.S. companies which are creating new jobs. Abundant domestic natural gas supplies have kept LNG imports at lower levels and supported reasonable prices.

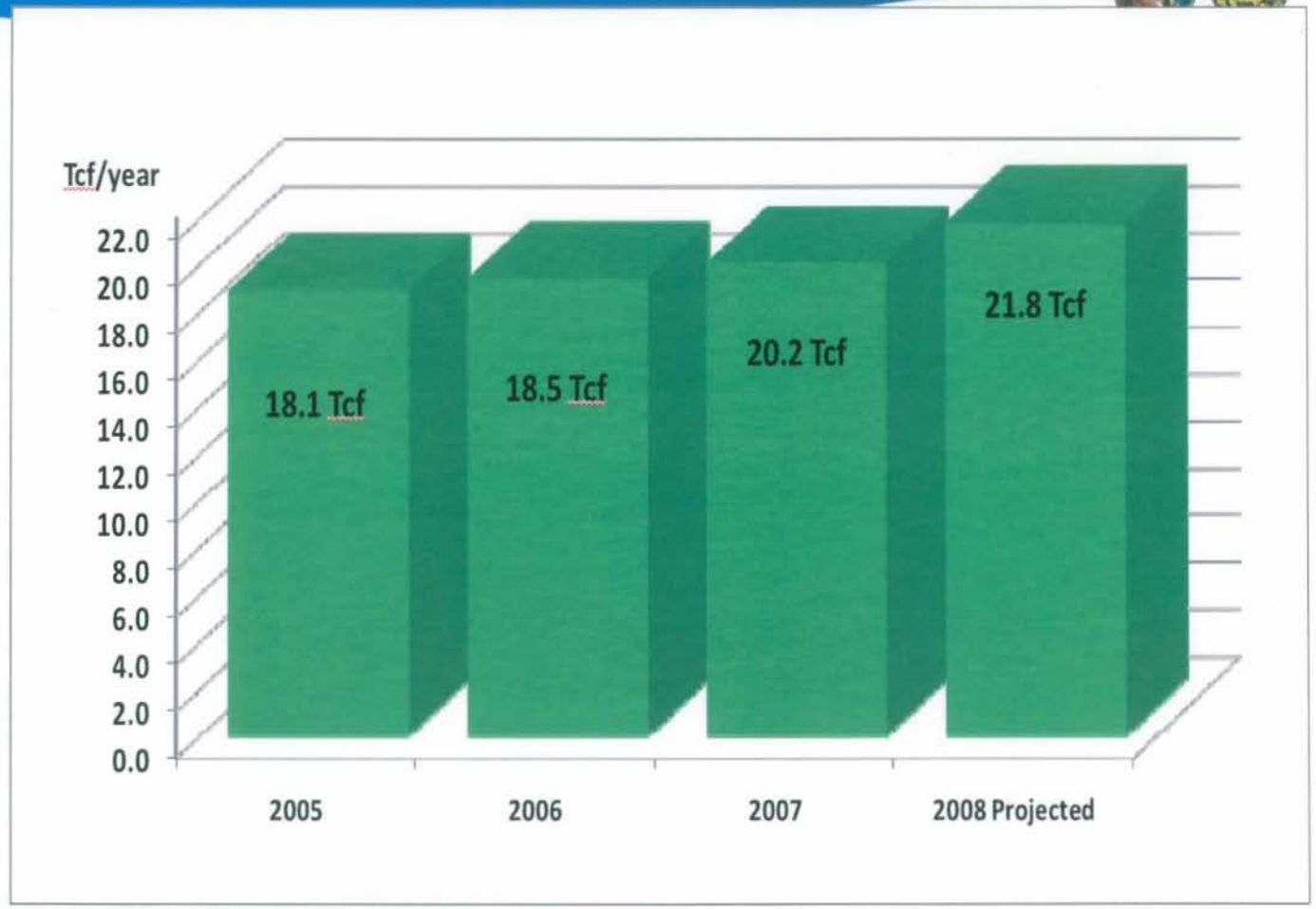
Clean

A natural gas vehicle (NGV) reduces emissions by almost 90% compared to a gasoline vehicle. A natural gas power plant is one of the cleanest sources of generation especially when paired with renewables like wind and solar.

Source: EIA

U. S. Natural Gas Production is Steadily Rising

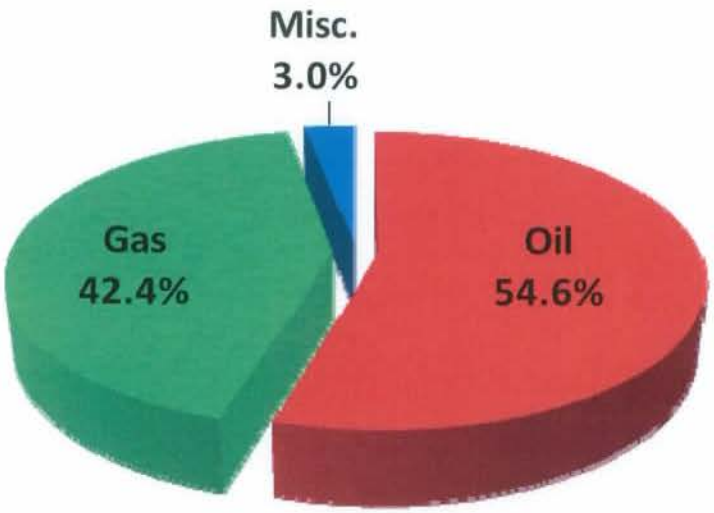
Strong year-over-year production growth has been led by the development of onshore fields, particularly in Texas and Wyoming.

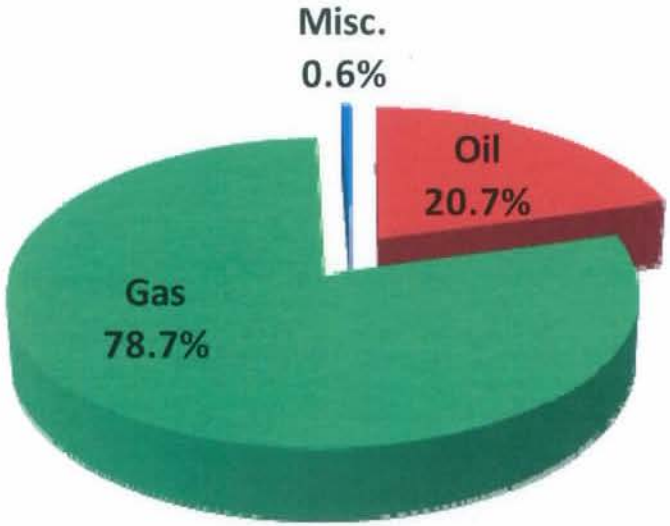


Source: EIA

In Late October 2008 Natural Gas Rig Count Continued at High Historic Levels

Driven by an increase in land rigs drilling for natural gas





1988

Total # of Rigs: 923

391 Natural Gas

504 Oil

28 Miscellaneous

2008

Total # of Rigs: 1,971

1,552 Natural Gas

408 Oil

11 Miscellaneous

Source: "North American Rotary Rig Count", Baker Hughes, 31 October 2008

Top 20 U.S. Natural Gas Producers

U.S. gas production upswing clearly underway and accelerating; with independents leading the way

Independents / Majors

Daily U.S. Natural Gas Production (a,b)

Production Ranking	Company (c)	Ticker	3Q'08	2Q'08	3Q'07	3Q'08 vs. 2Q'08 % Change	3Q'08 vs. 3Q'07 % Change	2007 U.S. Net Proved Gas Reserves	2007 Proved U.S Gas Reserve Ranking
1	Chesapeake	CHK	2,138	2,143	1,851	(0.2%)	15.5%	10,137	4
2	BP	BP	2,094	2,140	2,186	(2.1%)	(4.2%)	15,375	1
3	Anadarko	APC	2,075	1,869	1,637	11.0%	26.8%	8,504	6
4	ConocoPhillips	COP	2,073	2,132	2,335	(2.8%)	(11.2%)	12,634	3
5	Devon	DVN	2,007	1,939	1,783	3.5%	12.6%	7,143	7
6	XTO	XTO	1,949	1,795	1,561	8.6%	24.9%	9,441	5
7	EnCana	ECA	1,674	1,629	1,367	2.8%	22.5%	6,008	8
8	Chevron	CVX	1,431	1,588	1,695	(9.9%)	(15.6%)	3,226	11
9	EOG	EOG	1,196	1,139	997	5.0%	20.0%	4,220	9
10	ExxonMobil	XOM	1,167	1,274	1,435	(8.4%)	(18.7%)	13,172	2
11	Williams	WMB	1,096	1,110	926	(1.3%)	18.4%	4,143	10
12	Shell	RDS	942	1,096	1,131	(14.1%)	(16.7%)	2,468	15
13	El Paso	EP	793	724	848	9.5%	(6.5%)	3,100	12
14	Apache	APA	636	759	764	(16.2%)	(16.8%)	2,699	13
15	Southwestern	SWN	600	487	317	23.2%	89.3%	1,450	19
16	Occidental	OXY	570	602	604	(5.3%)	(5.6%)	2,672	14
17	Questar	STR	453	393	317	15.3%	42.9%	1,868	16
18	Newfield	NFX	449	480	510	(6.5%)	(12.0%)	1,810	18
19	Marathon	MRO	426	431	464	(1.2%)	(8.2%)	1,007	20
20	Noble	NBL	384	402	404	(4.5%)	(5.0%)	1,840	17
Totals/Average			24,153	24,132	23,132	0.3%	7.6%	112,918	

(a) Source: 99ompany reports
(b) In mmcf/day

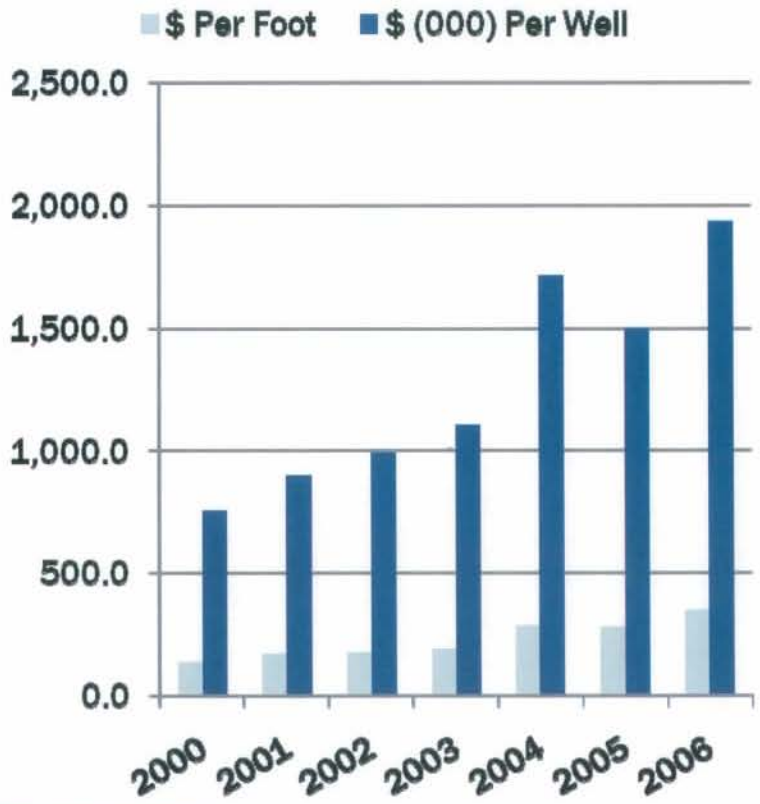
Unconventional Resources: Shale Gas

Horizontal Drilling Technology

Advantages

- Consists of sharp, rotating metal bit.
- Useful for long, thin reservoirs that are not efficiently mined with a vertical completion, horizontal entry into the reservoir allows it to be drained more efficiently.
- The production ratio for horizontal wells versus vertical wells is 3.2 to 1
- The cost ratio of horizontal versus vertical wells is only 2 to 1.
- In carbonate formations, where 90 % of horizontal drilling is done, productivity of horizontal wells is almost 400 percent higher than vertical wells, while they cost only 80 % more.

Drilling Costs



Sources: Naturalgas.org, EIA

Drilling in Unconventional Gas Plays

- Continuing improvements in the horizontal drilling and completion technologies are key to improving economic viability.

- Advances in technology are essential to offsetting increasing costs of services, raw materials and environmental costs.

- To remain economically viable, the unconventional natural gas industry will need to continue building on its successes by promoting greater cooperation between industry and government, accelerating technological progress, promoting efficiency and innovation.

Shale Play	Average Cost of Well (Millions US$)
Deep Bossier in East Texas	10.0
Dakota-Entrada-Navajo in Unita Basin	9.0-10.0
Fayetteville Shale	2.3
Woodford	5.0-6.0

Sources: Oil & Gas Journal

Shale Gas is the Industry's Focus

Robust Growth

Gas shales have experienced explosive growth in the past 10 years increasing from only 0.3 Tcf/year of production in 1998 to 1.1 Tcf/year in 2007.

Large Producer

Since the late 1990s, the largest producer of shale gas has been the Barnett Shale in the Forth Worth Basin.

Rising Production Rates

Rapid increase in production rates in the Barnett, Fayetteville, Woodford, Haynesville and Marcellus Shale plays continues to spur companies to invest in pipeline infrastructure in order to provide additional takeaway capacity.

Long-Lived Wells

Long-lived wells (50 years or more) are affecting the US natural gas reserve estimates.

Sources: Navigant Consulting , Inc. 2008, "When your gas reservoir is unconventional so is our solution: Shale gas." Schlumberger. 26 September 2007.

An Ocean of Natural Gas in America

The Top 21 Shales now being explored

Antrim 1
Bakken 2
Barnett 3
Barnett-Woodford 4
Baxter 5
Bend 6
Caney 7
Fayetteville 8
Floyd-Conasauga 9
Haynesville 10
Huron 11
Lewis 12
Marcellus 13
Monterey/McClure 14
New Albany 15
Niobrara 16
Paradox 17
Pearsall 18
Woodford/Anadarko 19
Woodford/Ardmore 20
Woodford/Arkoma 21

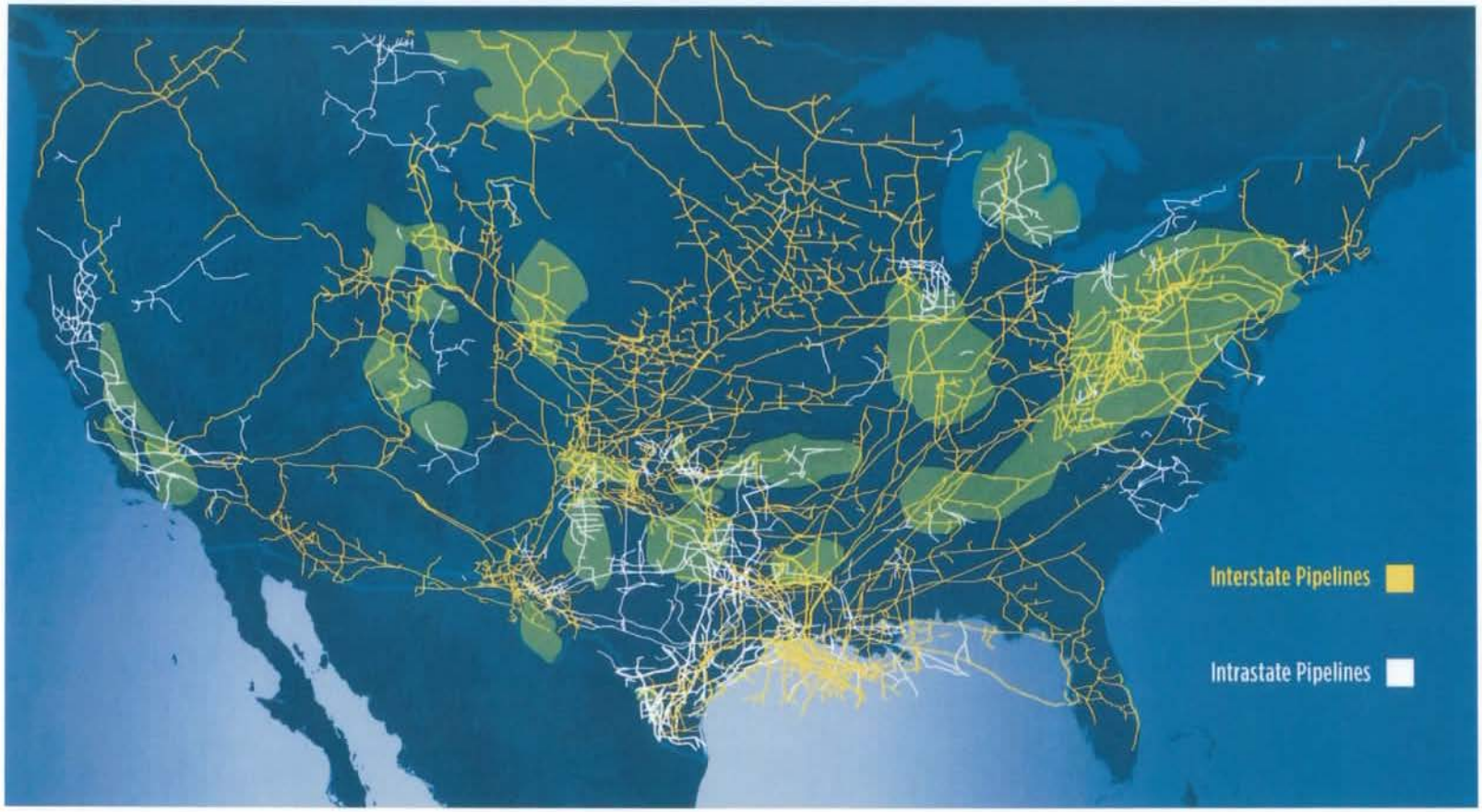
Source: American Clean Skies Foundation , compiled from various sources

Pipelines - Robust Expansion in 2007

- Additions were the largest of any year in the Energy Information Administration's (EIA) 10-year database of pipeline construction activity.
- Construction activity accelerated in 2007 with capacity additions to the grid totaling nearly 14.9 billion cubic feet (Bcf) of daily deliverability.
- About 1,700 miles of pipeline were installed, which was greater than in any year since 2003
- Only 4 of the 50 completed projects crossed regional boundaries, reflecting an emphasis on localized expansions or upgrades.
- Continued growth trend that began slowly in 2005 and intensified in 2006.
- 40% of the 50 pipeline projects completed in 2007 were associated with new production in Texas and the Rocky Mountain States of Utah, Colorado and Wyoming.

Source: EIA, US Natural Gas Pipeline Network

U.S. Natural Gas Shale Basins Align with Pipeline Grid



Source: EIA, US Natural Gas Pipeline Network

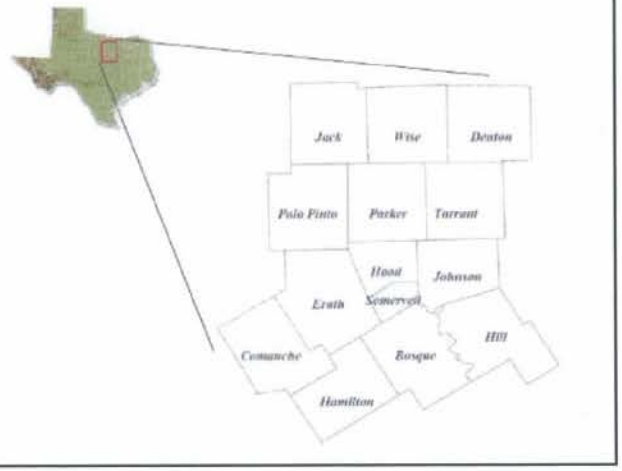
U.S. Natural Gas is Very Widely Distributed

American Clean Skies Foundation

U.S. Gas Shales» Major Play Highlights » Barnett

- **Description of Play:**
  - Location – Fort Worth, Texas (north central TX).
  - Activity Level – most active shale play in U.S. by far.
- **Players:**
  - Devon, Chesapeake, XTO, EOG, Encana, Burlington Resources (now ConocoPhillips), Range Resources, Quicksilver, Carrizo, Denbury (Source: Texas RRC Top 10 Operators, 1st Quarter 2008).
- **Technically Recoverable Gas Estimate:**
  - NCI's estimate of mean technically recoverable gas is 26.2 Tcf with 'maximum reported' of 44 Tcf. Gas in place to 327 Tcf.
- **Current/Forecast Production:**
  - NCI's estimate of production for 1Q2008 is 3.6 Bcf/day and roughly 4.3% of total US total output (15% of Texas production in 2007). In a June 11 report, EIA indicated a contribution of 6% of Lower 48 production.
  - Some producer estimates for peak production to 7 Bcf/day (NCI Producer Survey).

Barnett Shale Counties



Source: Humble Geochemical, Pickering Energy Partners

Sources: Navigant Consulting. "North American Natural Gas Supply Estimate". July 4, 2008.

Barnett Shale in Fort Worth and Surrounding Area – Supports Regional Economy

Business

Substantial direct business stimulus

Jobs

Benefits to the local economy have grown to $8.2 billion in output and 83,823 jobs in 2007

Real Estate

Real estate market of the region has seen enhanced activity (demand for office and other commercial and industrial space and an increased need for housing for employees)

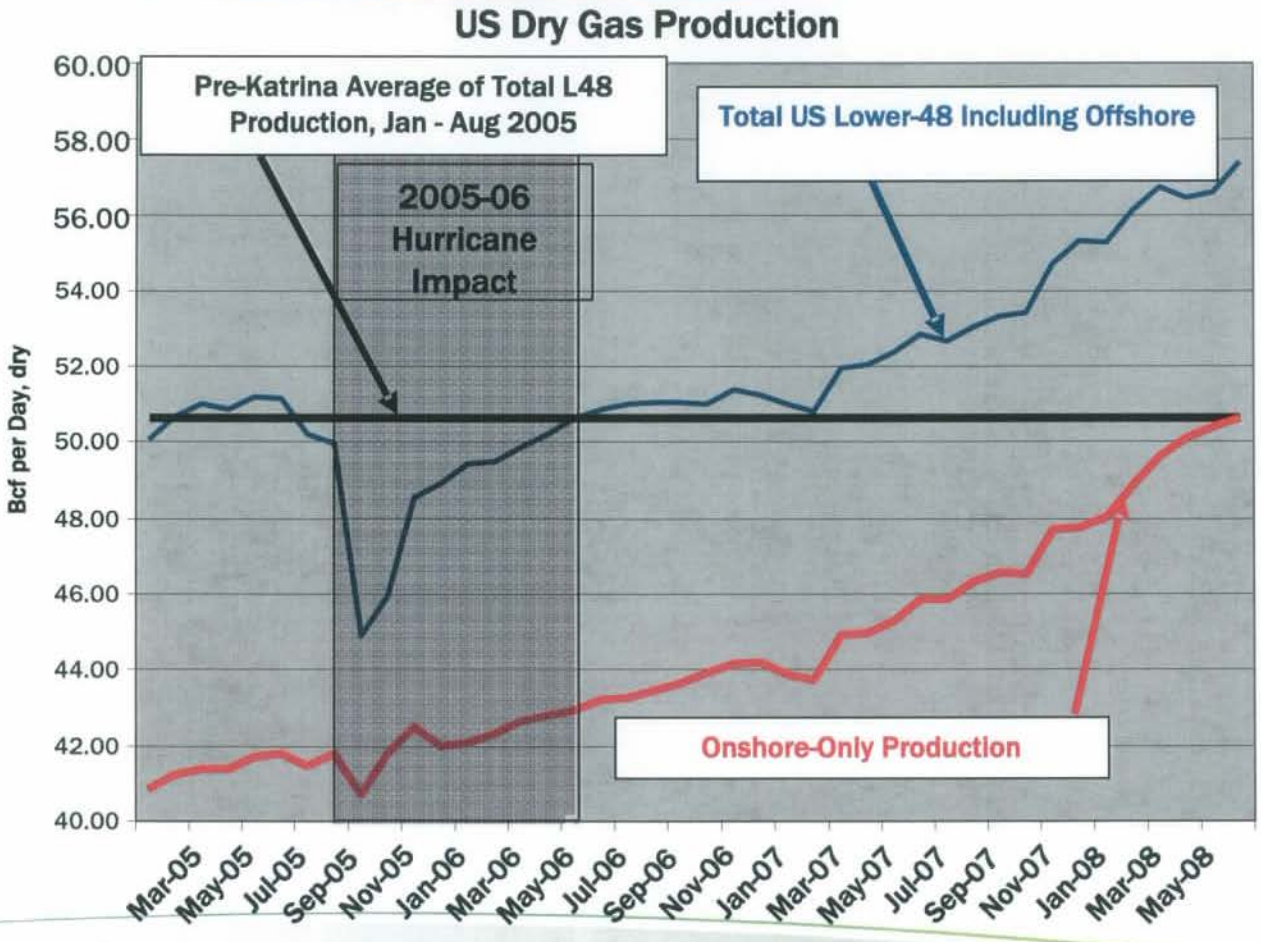
Tax Base

Property taxes generated by the expansion associated with the natural gas reserves support local school districts, cities, recreational facilities

Income

Royalty and bonus payments to local residents

As of June, Onshore Production has Reached the Total Production Level from the Period Prior to Katrina and Rita



Source: EIA Form 914 Data, Adjusted to Net Dry, Analysis by Navigant Consulting Inc.

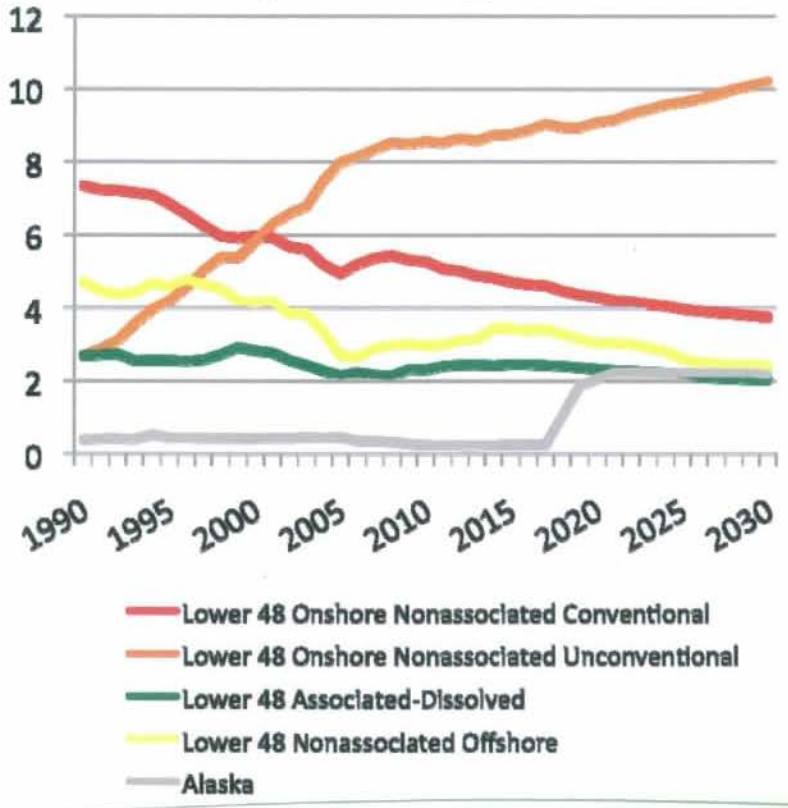
The Bottom Line

- U.S. Onshore Production has grown rapidly for the last three years.
- Onshore alone has reached the levels of total pre-Katrina U.S. Production, including onshore
- Month-to-month, the increase is continuing, driven by unconventional gas

EIA Projects By 2030, 50% of Domestic Natural Gas Supply Will Be From Unconventional Sources. According to Independent Producers, Unconventional Production Already Reached 46% in 2007

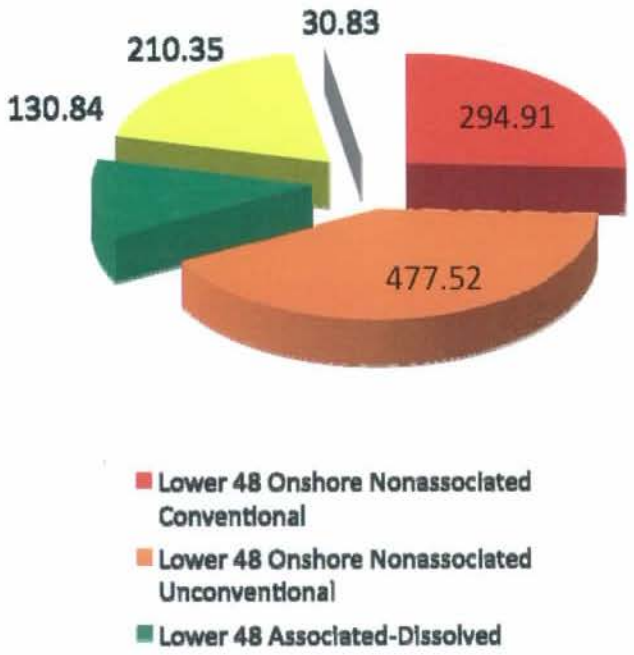
Production & Forecast

(trillion cubic feet)



Technically Recoverable Resources (2005)

(trillion cubic feet)

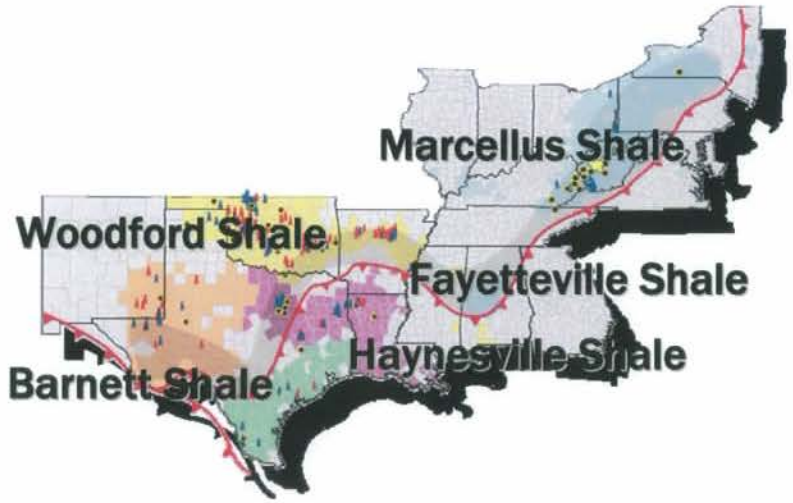


Sources: EIA, Annual Energy Outlook 2007, Potential Gas Committee, Potential Supply of Natural Gas in the United States 2007

Natural Gas Industry vs. EIA:

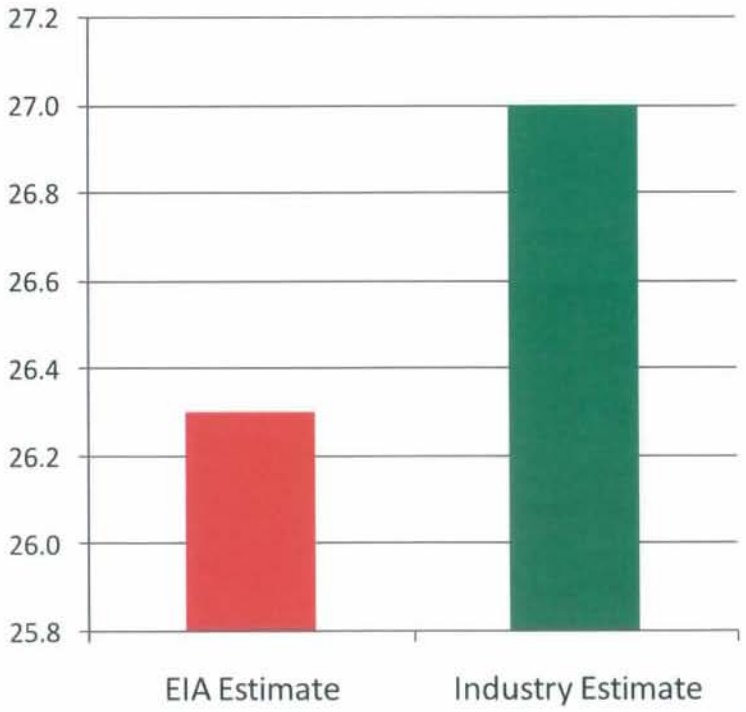
Industry expects production from 5 shale basins will exceed EIA total projections for all unconventional production

A **high-end** estimate of peak production: **41 Bcf/day**



251 Tcf of Shale Gas Potential in **5 of the 22** major shale plays

Peak Production Estimates
2012-2020
(Bcf/day)



Sources: EIA, Annual Energy Outlook 2008, Company reports

Will Robust Growth Continue?
Can the Natural Gas Resource Base Support Rising Demand ?

Abundant Resources

- Estimates by producers active in developing the shale resources reach levels that would imply more than 2,247 Tcf, or 118 years at current production levels.

Production Growth

- Unconventional gas, especially shale, has ramped up sharply over the last several years, both in terms of annual production and economically recoverable reserves.

Advanced Technologies

- Advanced technologies significantly expanded the economically recoverable volumes.

Supply Supports Demand

- Unconventional resource base appears adequate to support escalating demand and increased volumes of unconventional production to continue for decades.
- 1 Tcf of natural gas is enough to: heat 15 million homes for 1 year, or generate 100 billion kilowatt-hours of electricity, or fuel 12 million natural-gas-fired vehicles for 1 year.

Sources: Navigant Consulting, Inc. July 2008, Interstate Oil and Gas Compact Commission

Capital Cost Issues

- Energy prices continued to waffle amid uncertainties about the international economy, the value of the US dollar, and global energy demand through 2009.
- Outlook for global equity, interest rate, and exchange rate markets has become increasingly uncertain.
- Environment of investment value destruction and reluctance to open credit lines, margin calls on trading positions are increasing and are adding to the selling pressure on commodities.
- Rising acquisition, exploration, production costs.
- Increased costs of capital resulting in reduced capital expenditures.

Natural Gas : The Near-Term Solution for our Transportation Fuel Crisis

Natural Gas Vehicles
Reduce Emissions and Reduce Fuel Costs

Clean

- The only NGV passenger vehicle produced in the U.S., the Honda Civic GX, is the cleanest internal-combustion powered car on the road according to the Energy Department rankings.
- The American Council for an Energy-Efficient Economy calls it the cleanest-burning internal-combustion vehicle on Earth.

Economical

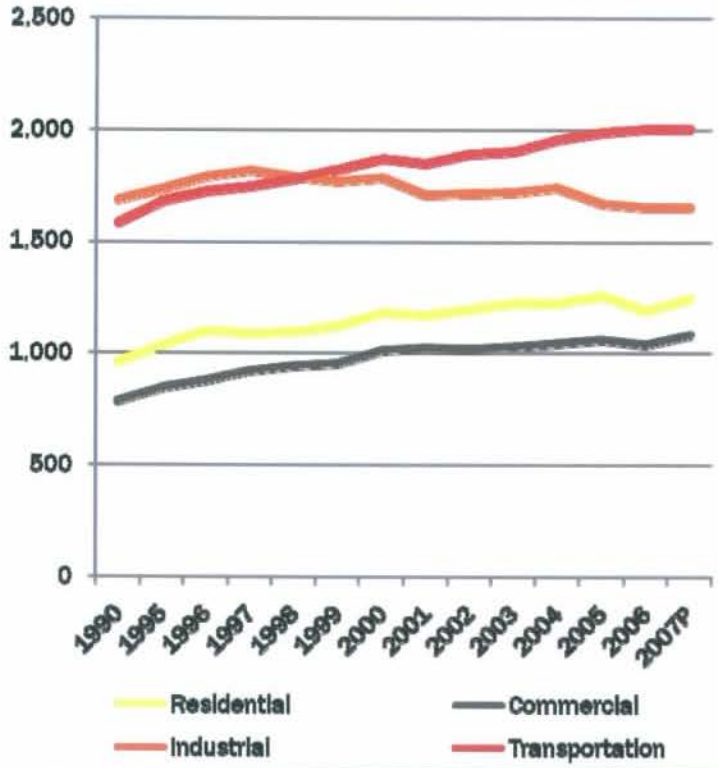
- Annual fuel costs of driving 15,000 miles with the only NGV produced in U.S. are **$884** for a NGV, $**1,289** for a hybrid and **$1,868** for a gasoline model.
- Uses domestically produced fuel – the same stuff your gas stove burns – that costs as little as one third the price of gasoline.
- Refueling station can be installed at residence, and can refuel overnight, since the system taps into natural-gas lines.
- Increasing natural gas use for transportation, even as much as meeting one-third of the President's 35 billion gallon target to replace foreign oil would have a minimal impact on natural gas demand since discoveries continue to keep pace with consumption.
- Almost 20% of fleet vehicles have converted to natural gas, as it becomes fuel of choice.

Sources: AGA, www.fueleconomy.gov

The Transportation Sector is the Largest Emitter of CO_2 Gases

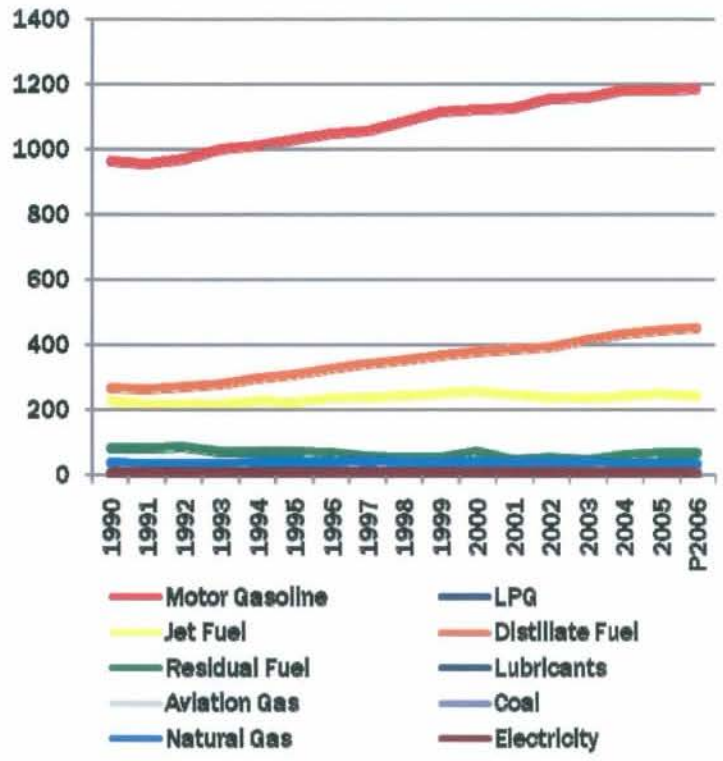
Emissions of CO_2 by Sector

(million metric tons of carbon dioxide)



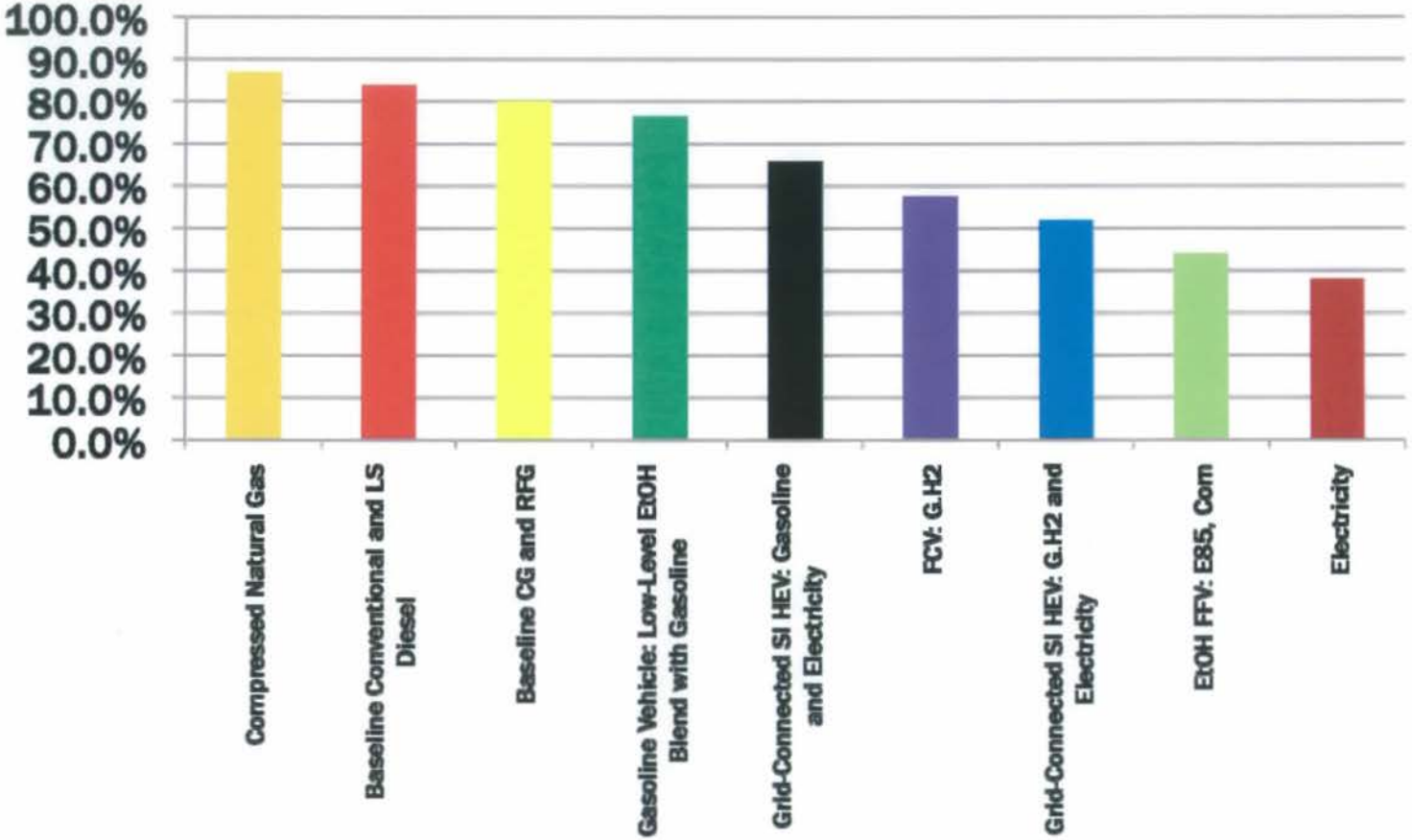
Motor Gasoline Emissions

(million metric tons of carbon dioxide)



Sources: EIA, Annual Energy Review 2008, Emissions Greenhouse Gases Report 2006

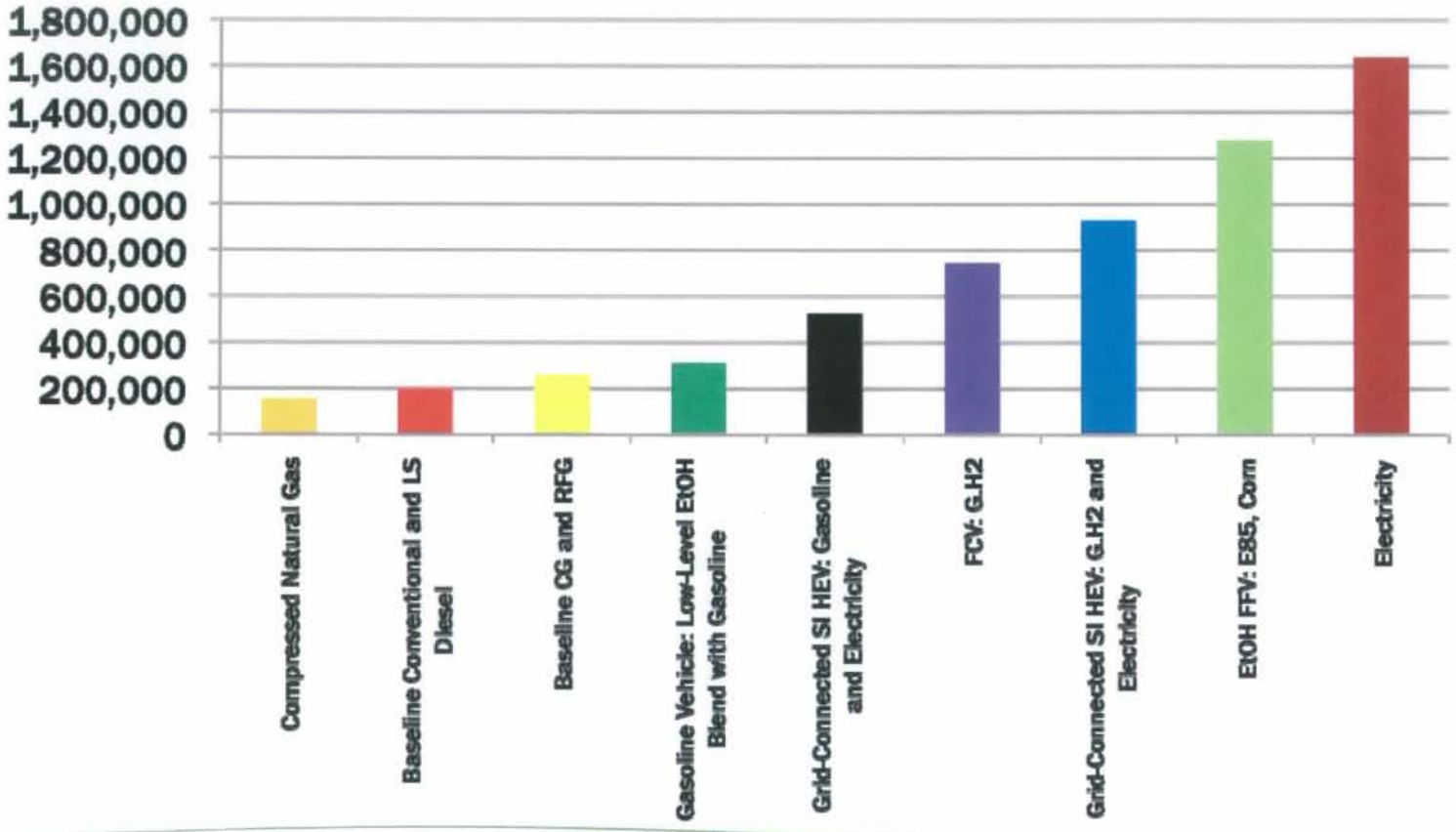
"Well to Gasoline Pump" Efficiency of Various Alternative Fuel Choices



Sources: The Greenhouse Gases, Regulated Emissions, and Energy Use in Transportation (GREET) Model 1.8b

"Well to Wheels" Total Energy Consumption of Select Alternative Fuel Choices

(Btu/mile)



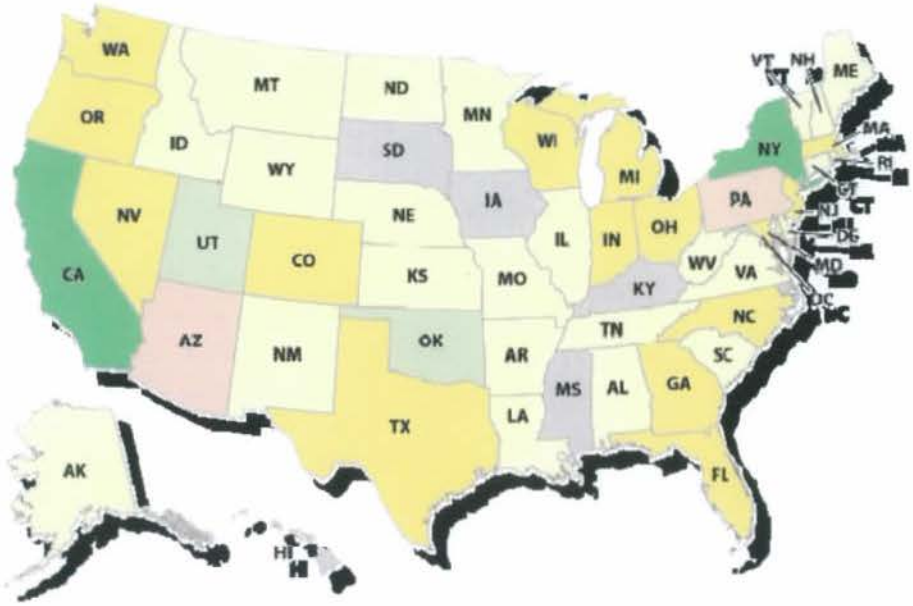
Sources: The Greenhouse Gases, Regulated Emissions, and Energy Use in Transportation (GREET) Model 1.8b

8 Million Natural Gas Vehicles Worldwide – The U.S. is Way Behind

Country	Number of NGVs
Argentina	1,650,000
Pakistan	1,550,000
Brazil	1,425,513
Italy	432,900
India	334,820
Iran	263,662
Columbia	203,292
USA	146,876
China	127,120
Ukraine	100,000

• http://www.iangv.org/tools-resources/statistics.html

Natural Gas is a Clean Transportation Fuel



Natural Gas Stations

- None
- 10 or less
- 11-20
- 21-50
- 51-100
- 101-200

Sources: DOE, NREL, Alternative Fuel Price Report 7/2008, EIA Weekly Retail Gasoline and Diesel

Phill is Right at Home

Home Refueling

- Using the home refueling station, fuel costs drop to approximately $2.00 per gallon.
- City of Chino, California has adopted an ordinance, effective July 2006, requiring all privately-owned, newly-constructed, residential garages in the city have a refueling connection for Compressed Natural Gas (CNG)-fueled cars.

Tax Credits

State and federal tax credits can offset or even completely cover the initial purchase price.

Benefits:

- **Convenient** - *refuels a typical compact car overnight.*
- **Quiet** - *produces no more noise than an air conditioning unit.*
- **Economical** - *uses no more electricity than an average* small appliance.
- **Flexible** - *easily mountable inside or outside a garage.*

Sources:
http://www.greencarcongress.com/2006/10/chino_mandates.html, http://www.myphill.com/benefits.htm

Natural Gas : The Clean Choice for Electricity Generation and the Natural Partner for Renewables

The Perfect Partners – Natural Gas and Renewables

Wind & Natural Gas

- Contributes to fuel diversification
- Dynamic fuel switching capabilities
- Decreased fossil fuel consumption and fuel costs
- Abundant supplies
- Utilize existing transmission and distribution infrastructures

Solar & Natural Gas

- Easily integrated technologies
- Optimizing consumption of fossil fuel
- Reduced emissions
- Minimal impact on environment
- Reduced fuel costs
- Lower capital costs
- Improved efficiency

Sources: U.S. DOE Annual Report on Wind Power, Installation, Cost, and Performance Trends:2007, Integrated Gas Turbine-Solar Power Plant, H. Alrobai, 2007

A Natural Partner with Renewables for a Green Grid

Simplified Combined Cycle

- **Natural gas power plants can now be paired** with wind turbines or solar power to make electric power available when the wind doesn't blow or the sun doesn't shine.

- **Simplified Combined Cycle** is a simple and capable new process that takes existing natural gas power plants and achieves the highest efficiency of any in the country – while lowering greenhouse gas emissions.

- This new combination power plant – **using renewable energy and natural gas** – maximizes the use of renewable power (wind or solar) and the efficiency of natural gas, so the blended cost of electricity is **competitive with the least expensive power today.**

- Several successful SCC projects are complete and total orders through 2012 are estimated at 511 turbines and with them, **the potential to reduce greenhouse gases by 45 million tons of CO_2 per year**.

Help Us Change America and the World for the Better

AMERICAN CLEAN SKIES FOUNDATION™

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www.cleanskies.tv