Natural Gas Demand Outlook

Presentation to:
REAL Lunch
Denver, CO

May 21, 2013
By:
John Harpole

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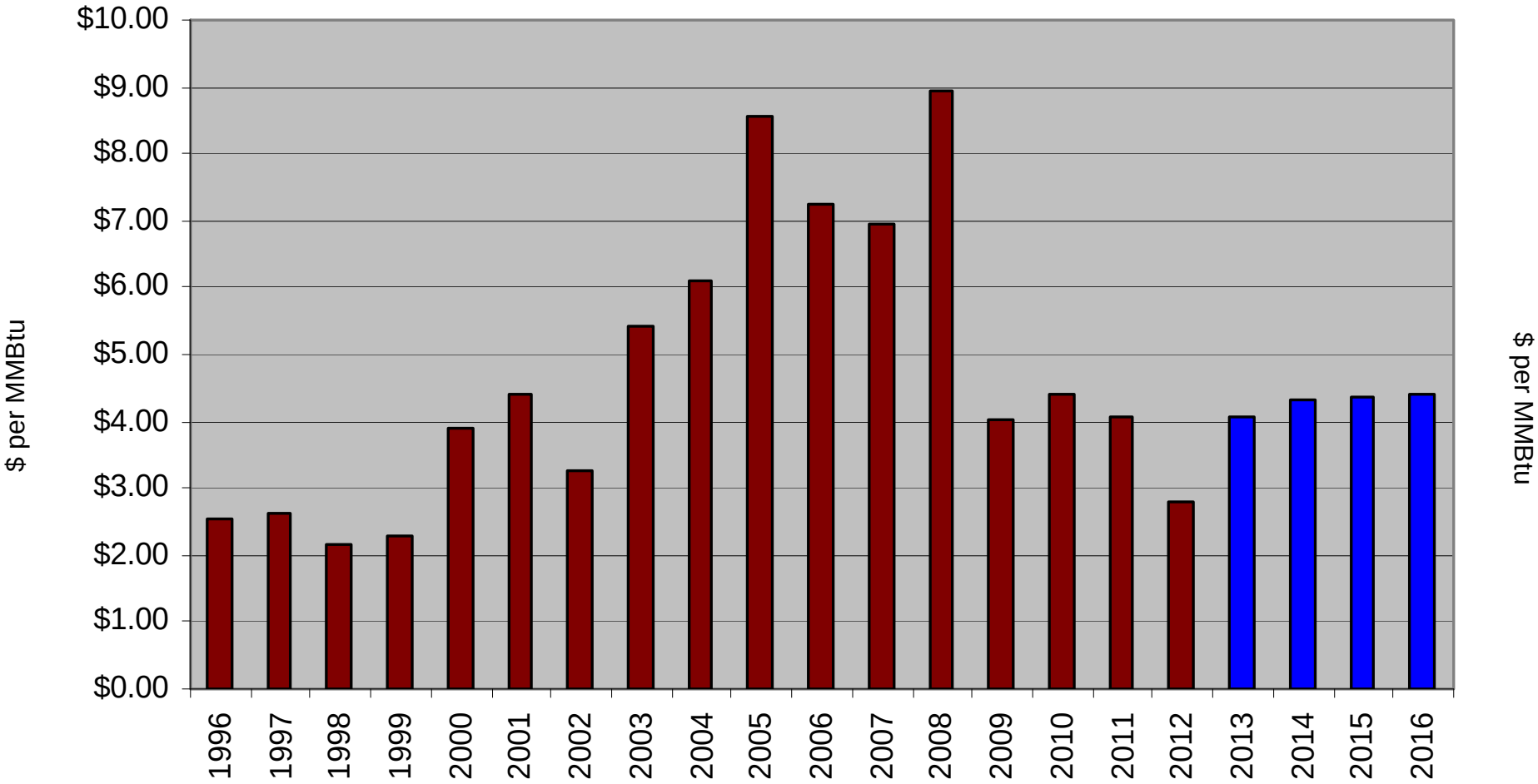
NYMEX Henry Hub Natural Gas Price*
1996 - 2016 Actual/Forecast**



Source: *Average of last three days of trading as published in the Platts Gas Daily Report

** Future forecasts based on NYMEX Henry Hub indices in Clearport Software as of 4/30/2013

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Current NYMEX Natural Gas Prompt Month June is trading at $4.09 per MMBtu (as of 5/20/2013) – Why?

- It was a cold winter and early spring
- Current storage level is 32% less than last year
- This winter residential/commercial demand increased by nearly 25% over the same period last year
- But…power generation demand fell by 12%
- Net the two numbers – total demand increased approximately 6.5 BCF/D
- Watch for a warm weather correction

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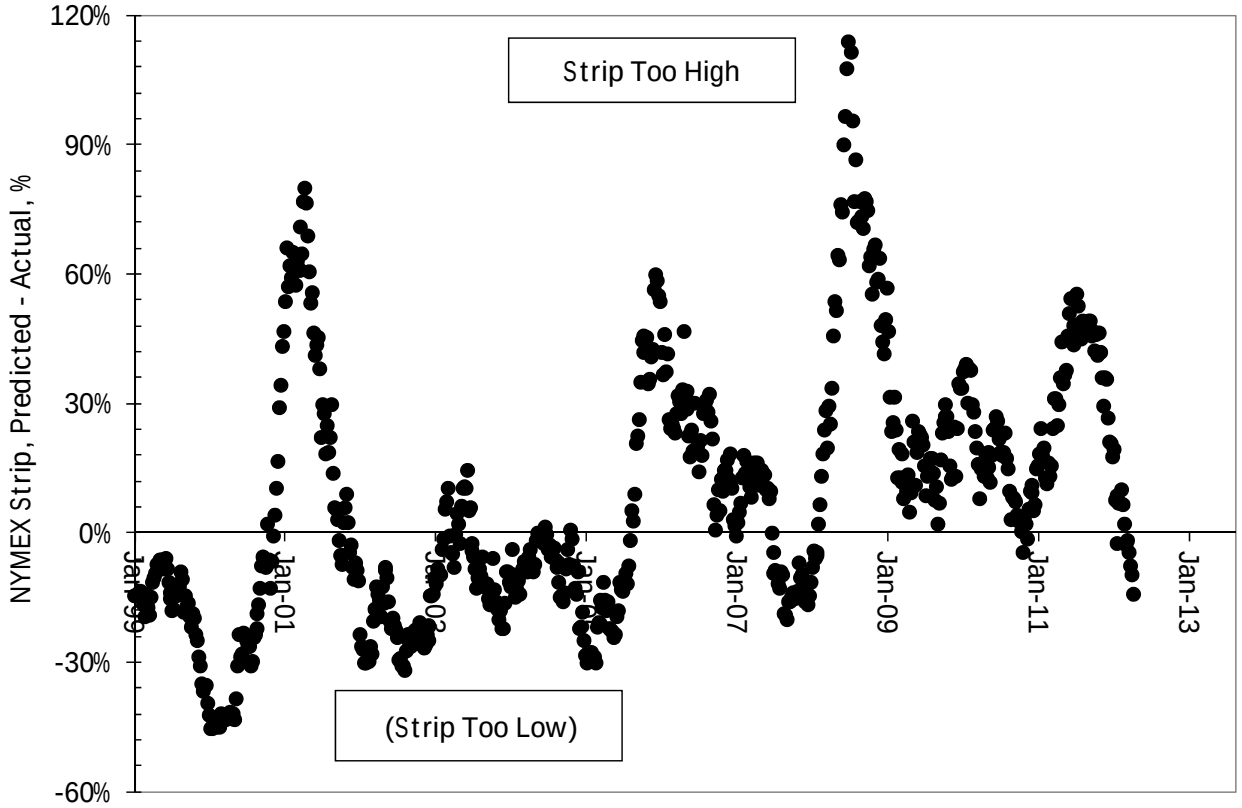
Source: Platts Gas Daily, April 15, 2013

Futures, Are They Accurate?



"That's mathematics, son. You can argue with me, but you can't argue with figures"

-**Foghorn Leghorn**

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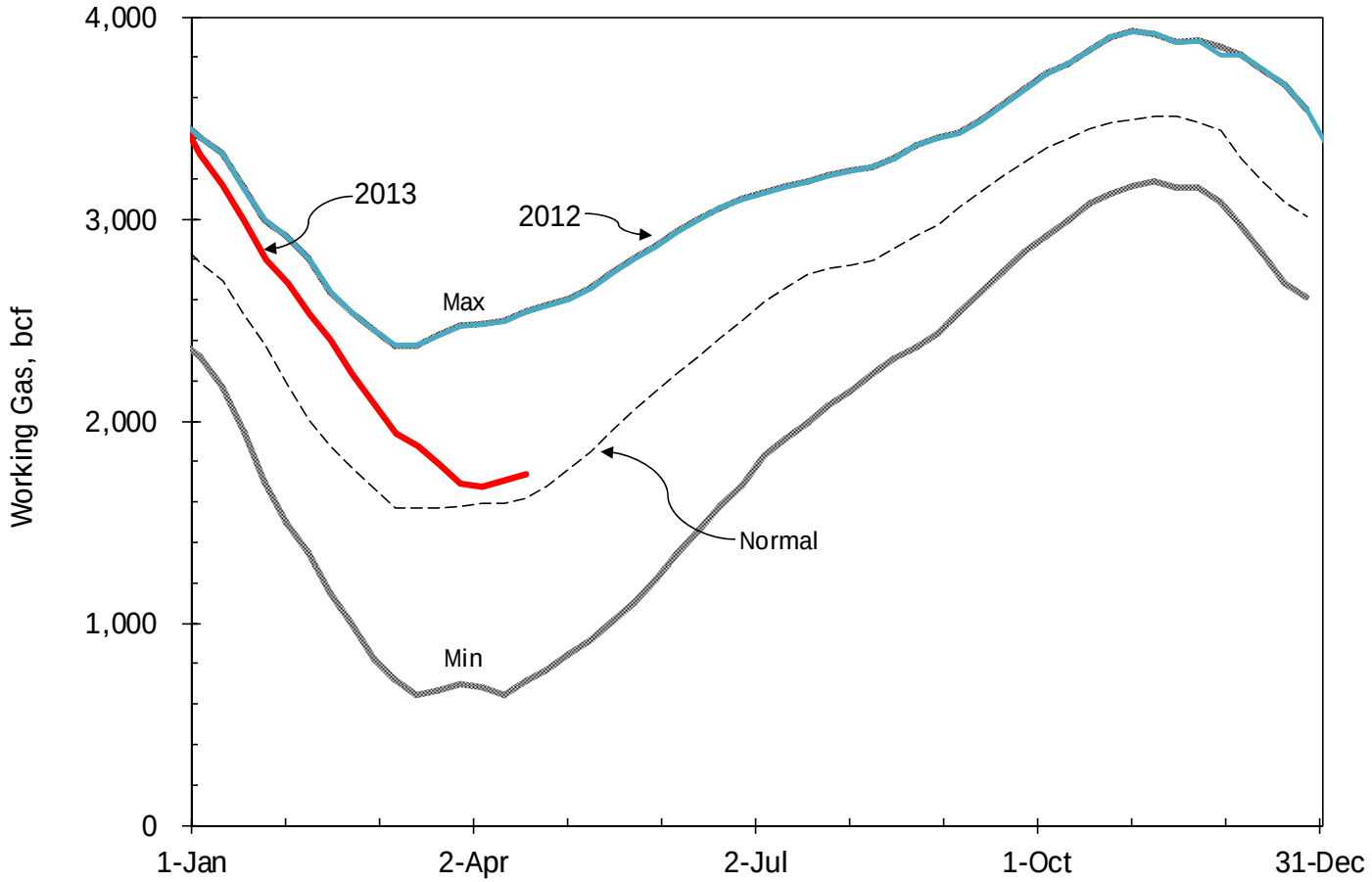
Sources: Bloomberg, TPH Estimates

Dave Pursell, Tudor Pickering Holt & Co., *Macro Natural Gas and Oil Thoughts* presentation, May 2, 2013

Natural Gas Storage



Source: Bloomberg
Dave Pursell, Tudor Pickering Holt & Co., *Macro Natural Gas and Oil Thoughts* presentation, May 2, 2013

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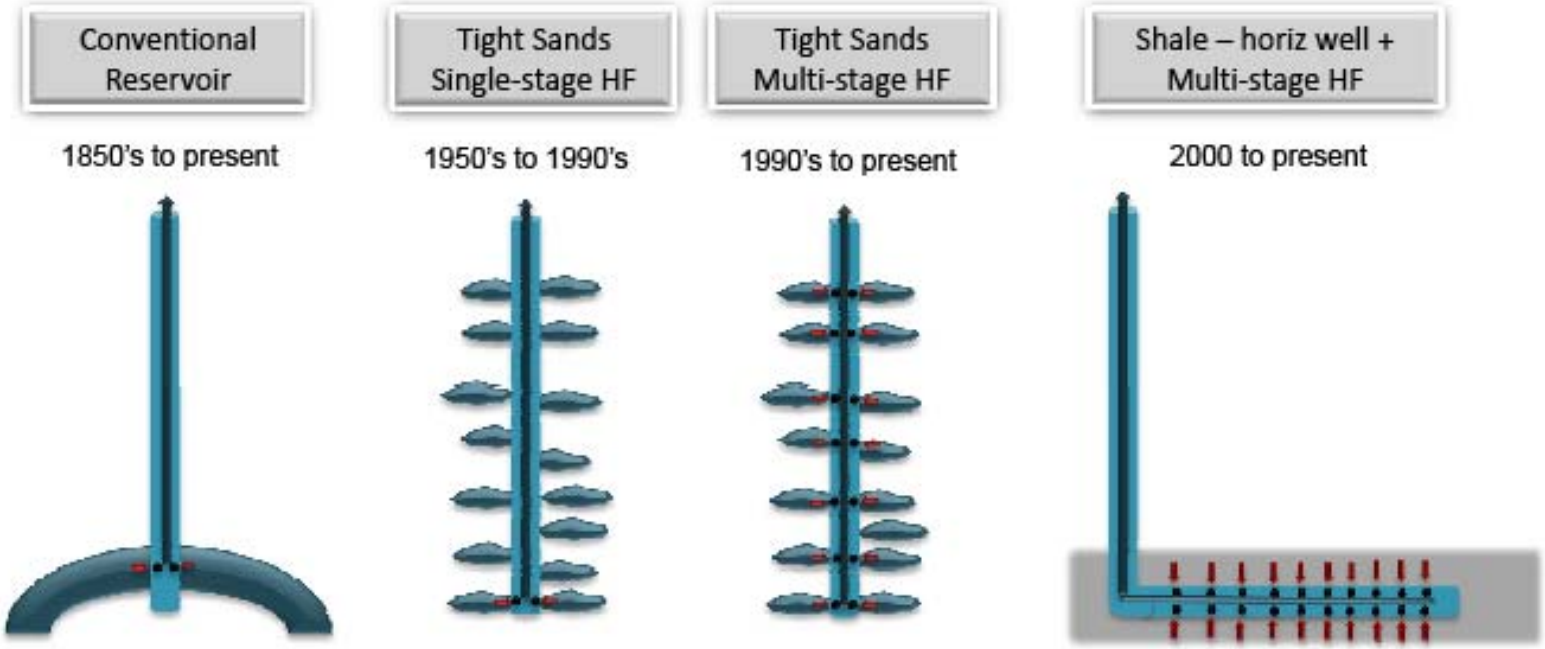
AMERICA'S NATURAL GAS ALLIANCE

EVOLUTION IN GAS WELL COMPLETEION TECHNOLOGY - THE KEY TO TODAY'S NATURAL GAS REVOLUTION



Multi-stage hydraulic fracture stimulation (HF) unlocks gas in unconventional reservoirs

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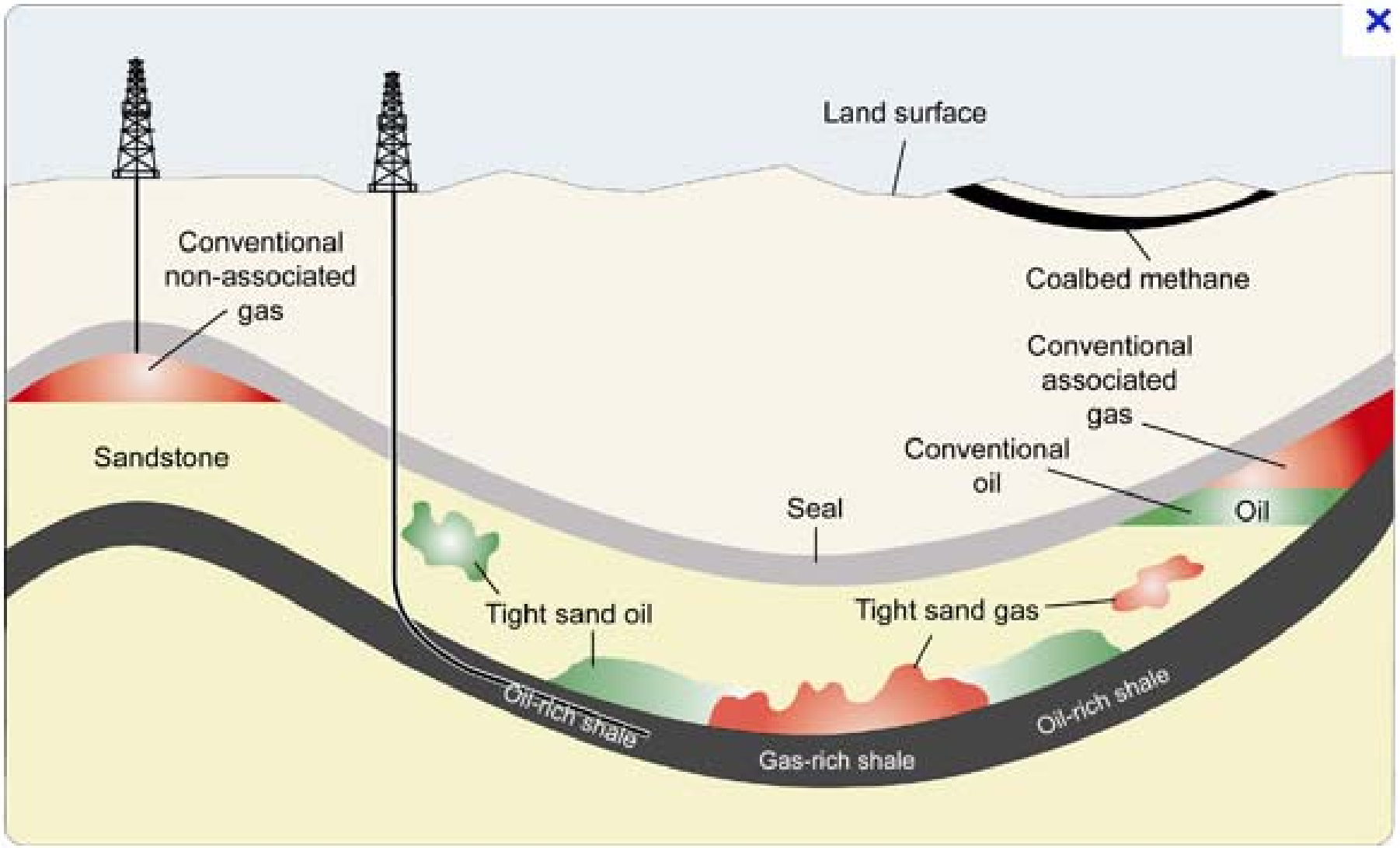
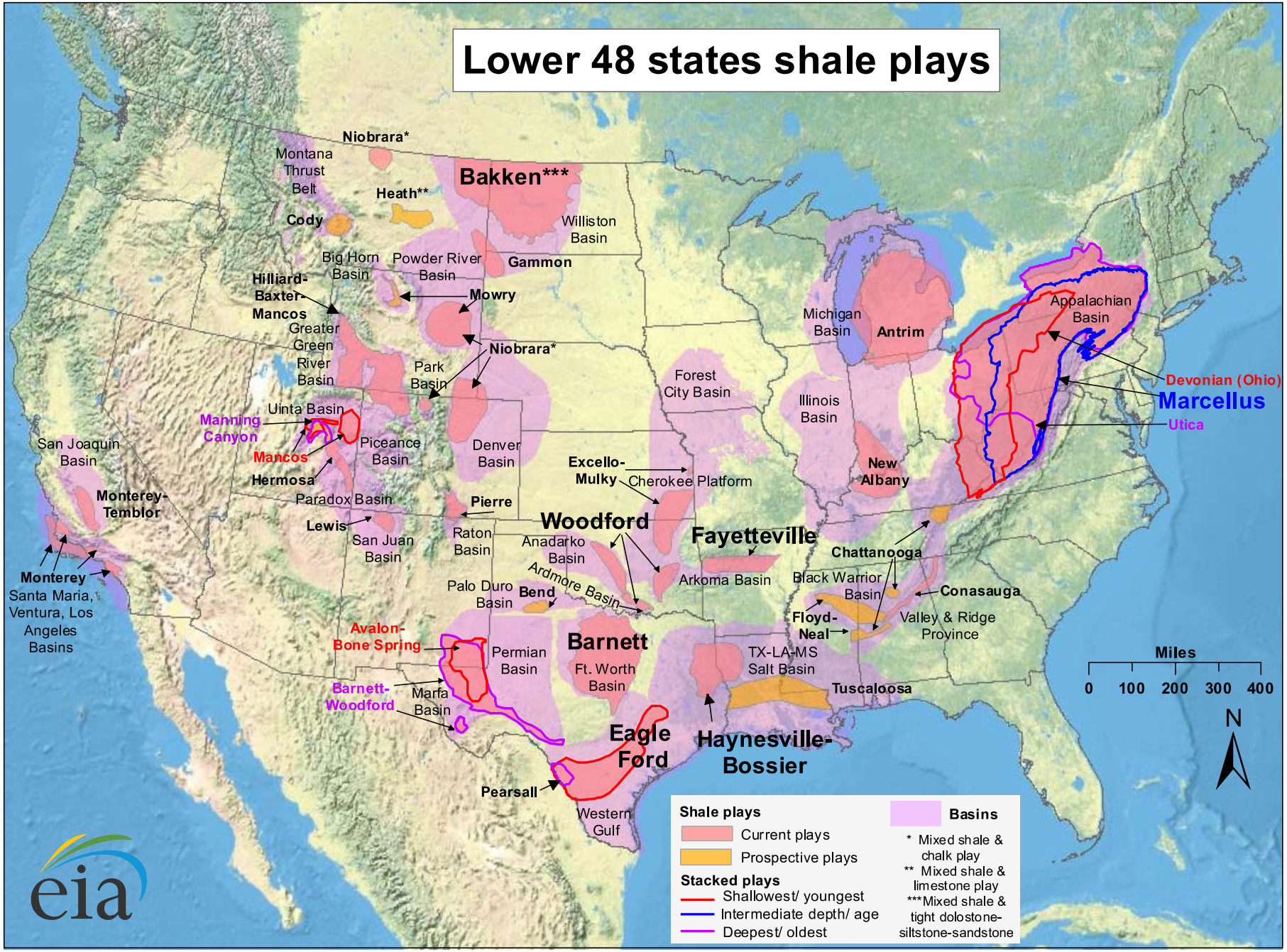
Source: *America's New Natural Gas,* America's Natural Gas Alliance

Conventional vs Unconventional Reservoirs



Source: Chris Wright, Liberty Resources Tuesday Lunch Club Presentation, 3/5/13



Source: Energy Information Administration based on data from various published studies.
Updated: May 9, 2011

THE SUPPLY CURVE HAS MOVED

According to the Potential Gas Committee, during the last two years, the future gas supply estimate for the US rose nearly 25% to a 48-year record of 2,688 TCF.

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Forecasts for Shale Gas Resource?

- 2008 - 347 TCF - Energy Information Administration (EIA)
- 2008 - 840 TCF - Navigant for Clean Skies Foundation
- 2009 - 616 TCF - Potential Gas Committee (PGC)
- 2011 - 827 TCF - Energy Information Administration (EIA)
- 2013 – 1,073 TCF - Potential Gas Committee (PGC)

Source: Various resource estimates

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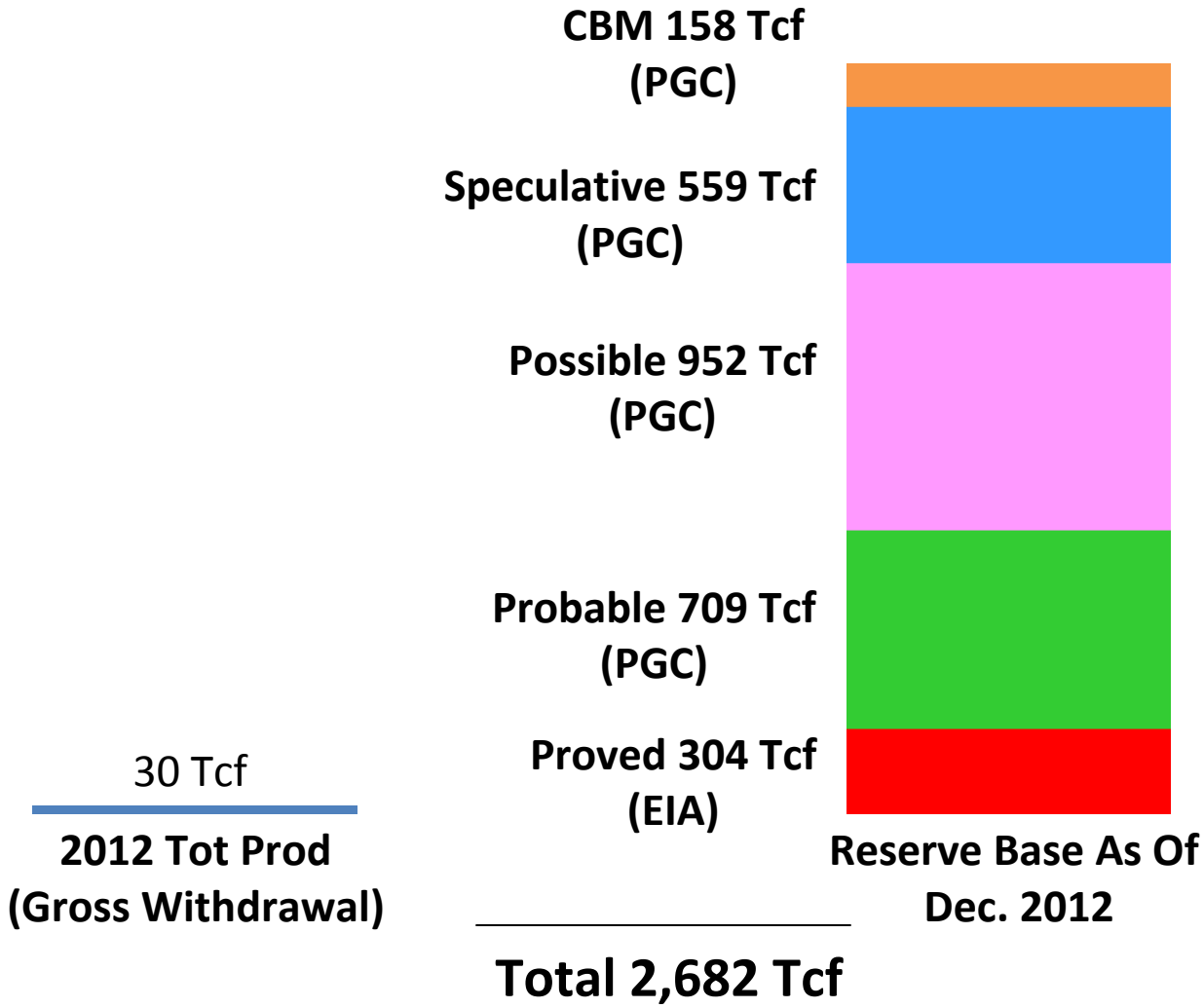
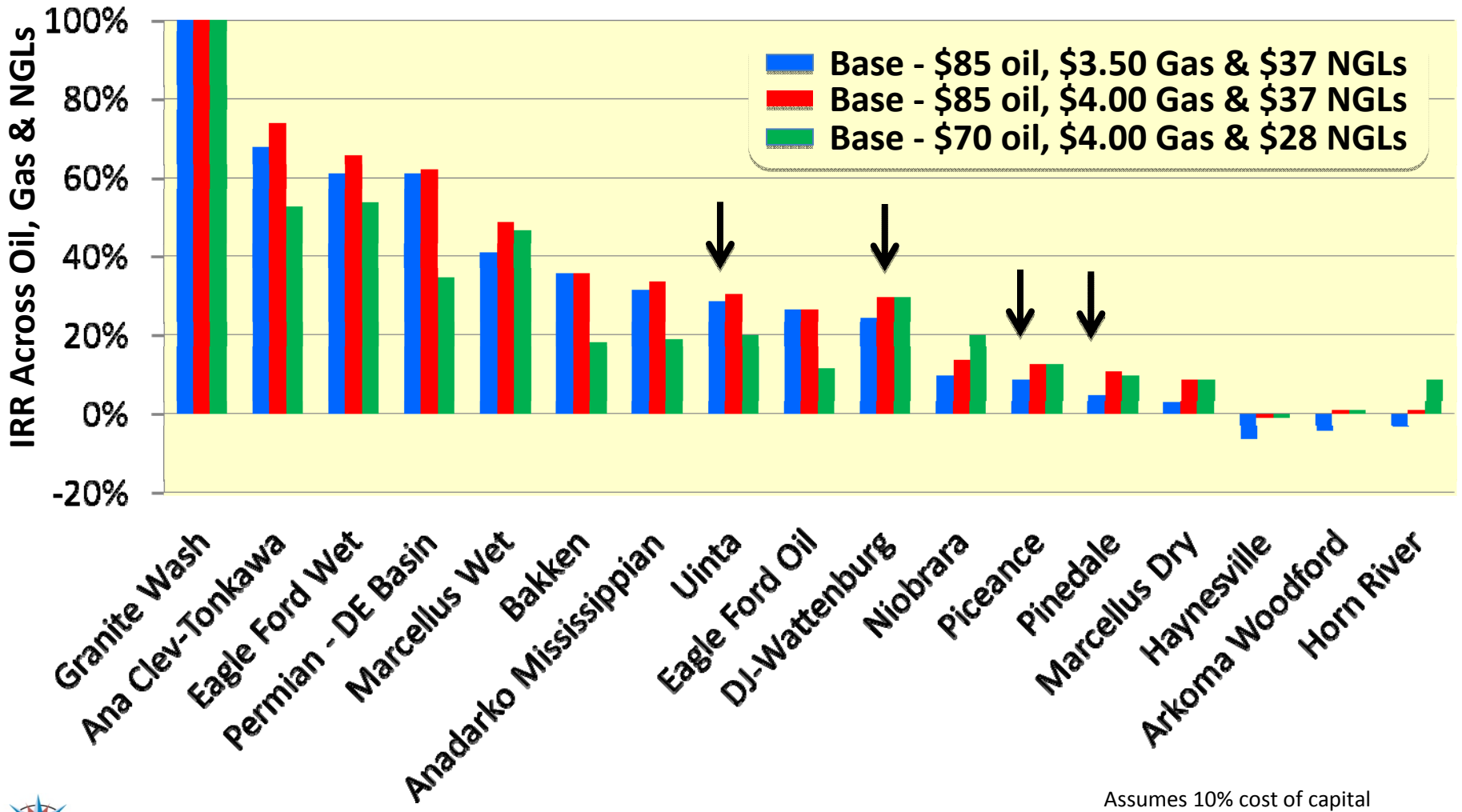
The U.S. Has An Enormous N. Gas Resource Base



Source: Ponderosa Advisors LLC

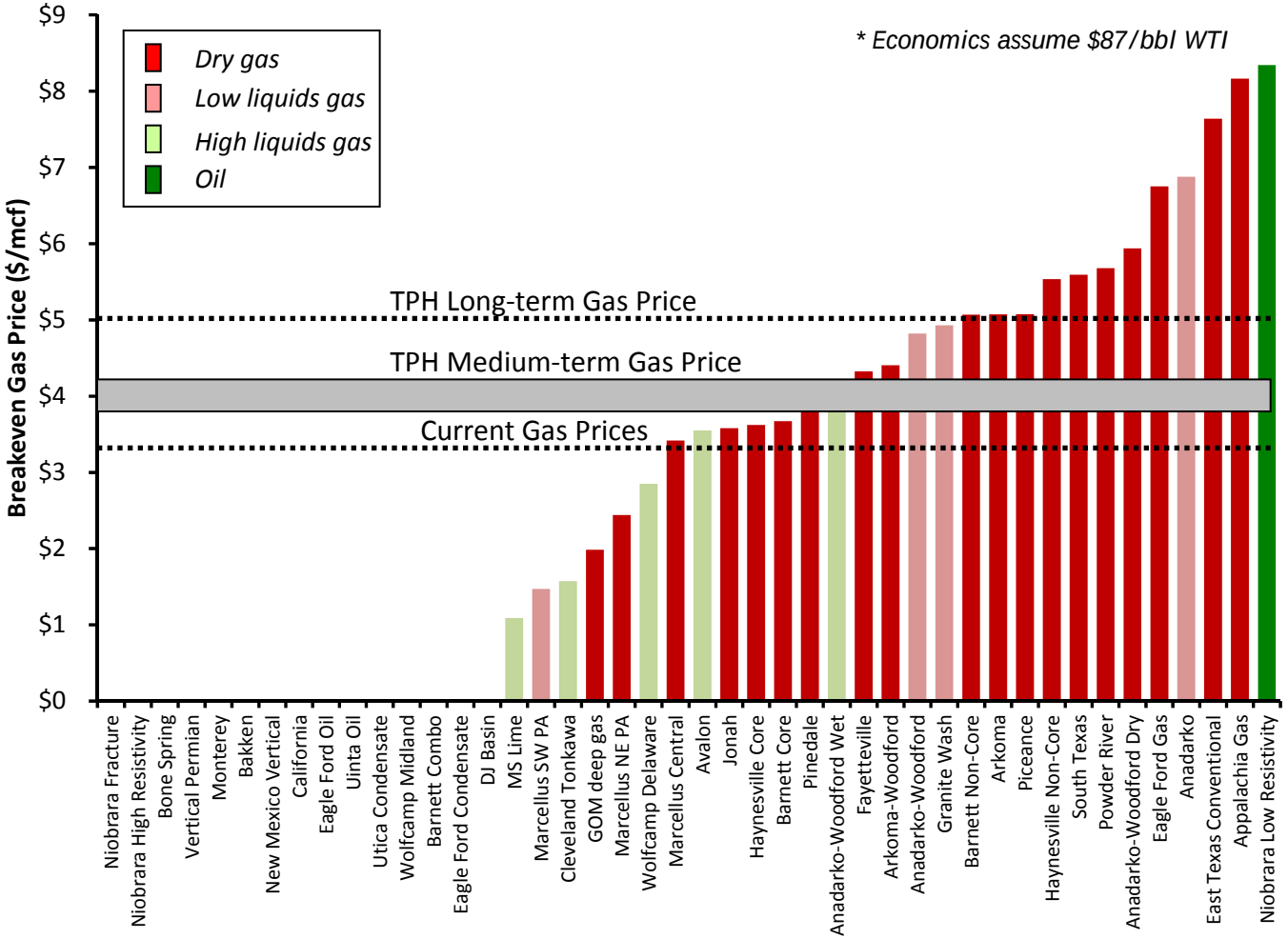
Much Of The U.S. Is Economical Even With $70 Oil



Assumes 10% cost of capital

Source: Ponderosa Advisors LLC

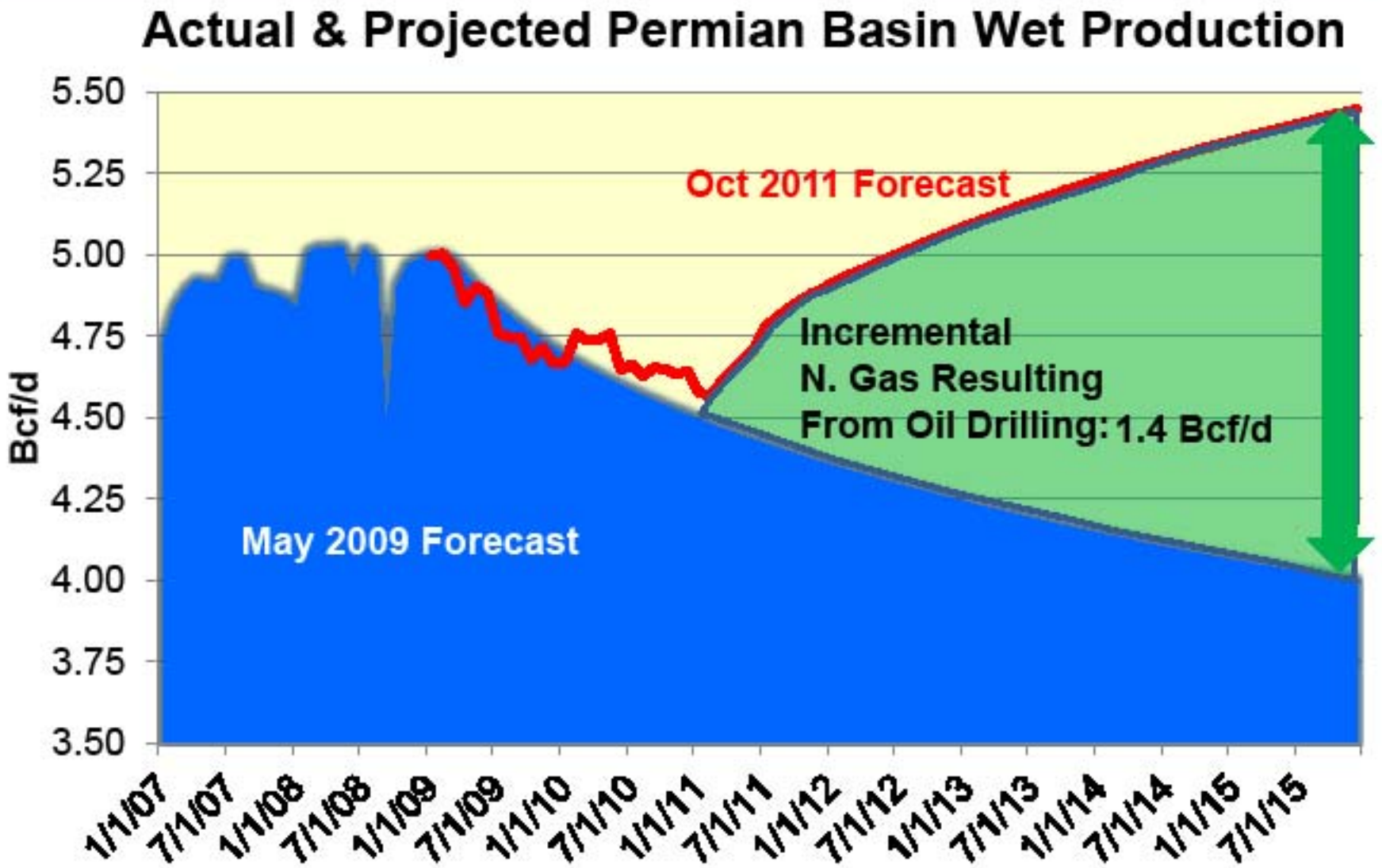
Basin Economics – Gas Price Required for 10% ATROR



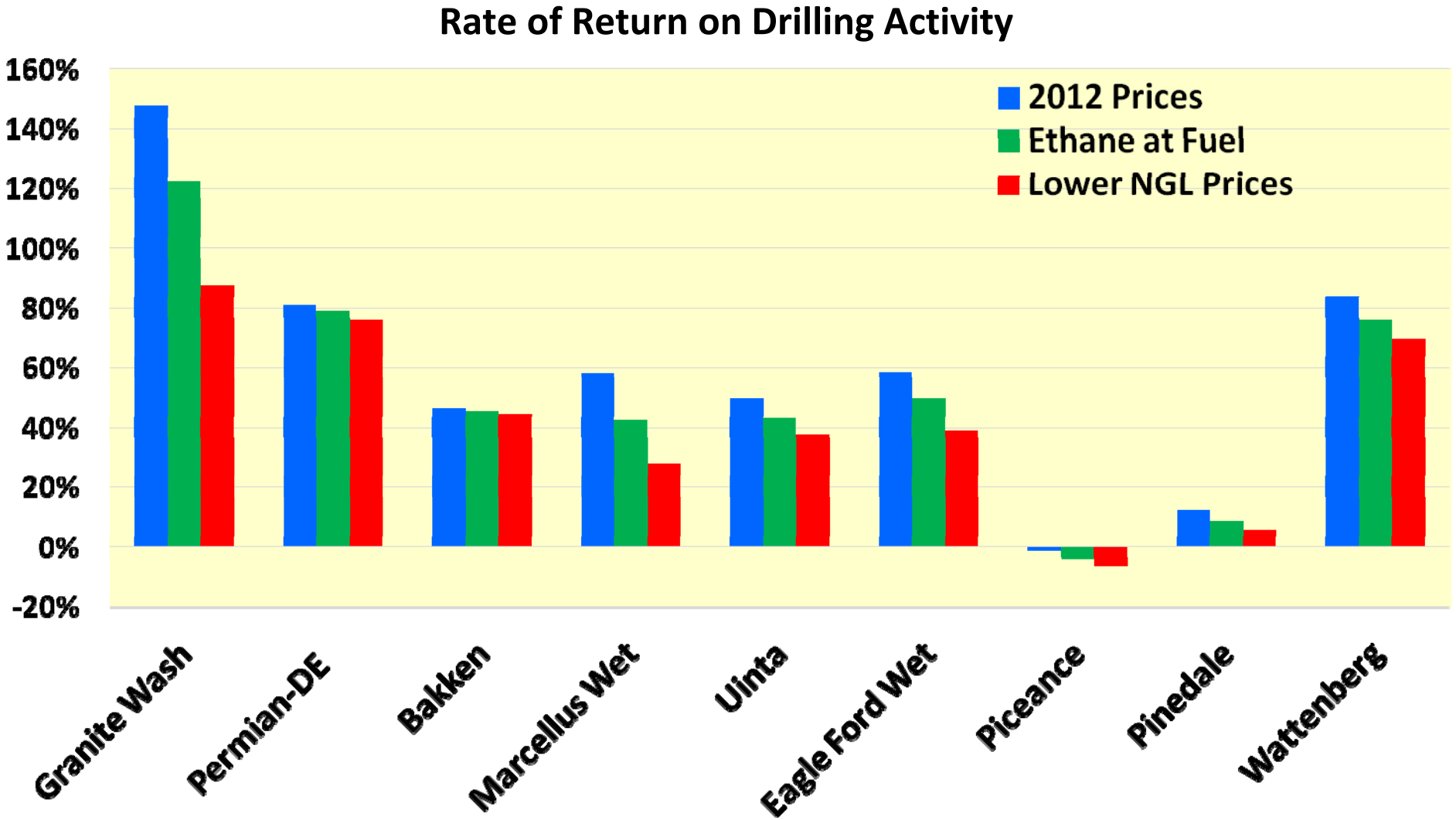
- Improving well productivity and cost efficiencies continue to move marginal costs to the left
- Incremental activity from Marcellus/Haynesville likely happens in the ~$4/mcf or lower range…major headwind

Source: TPH
Dave Pursell, Tudor Pickering Holt & Co., *Macro Natural Gas and Oil Thoughts* presentation, May 2, 2013

Ironically, Oil & Liquids Exploration Drives Gas Production

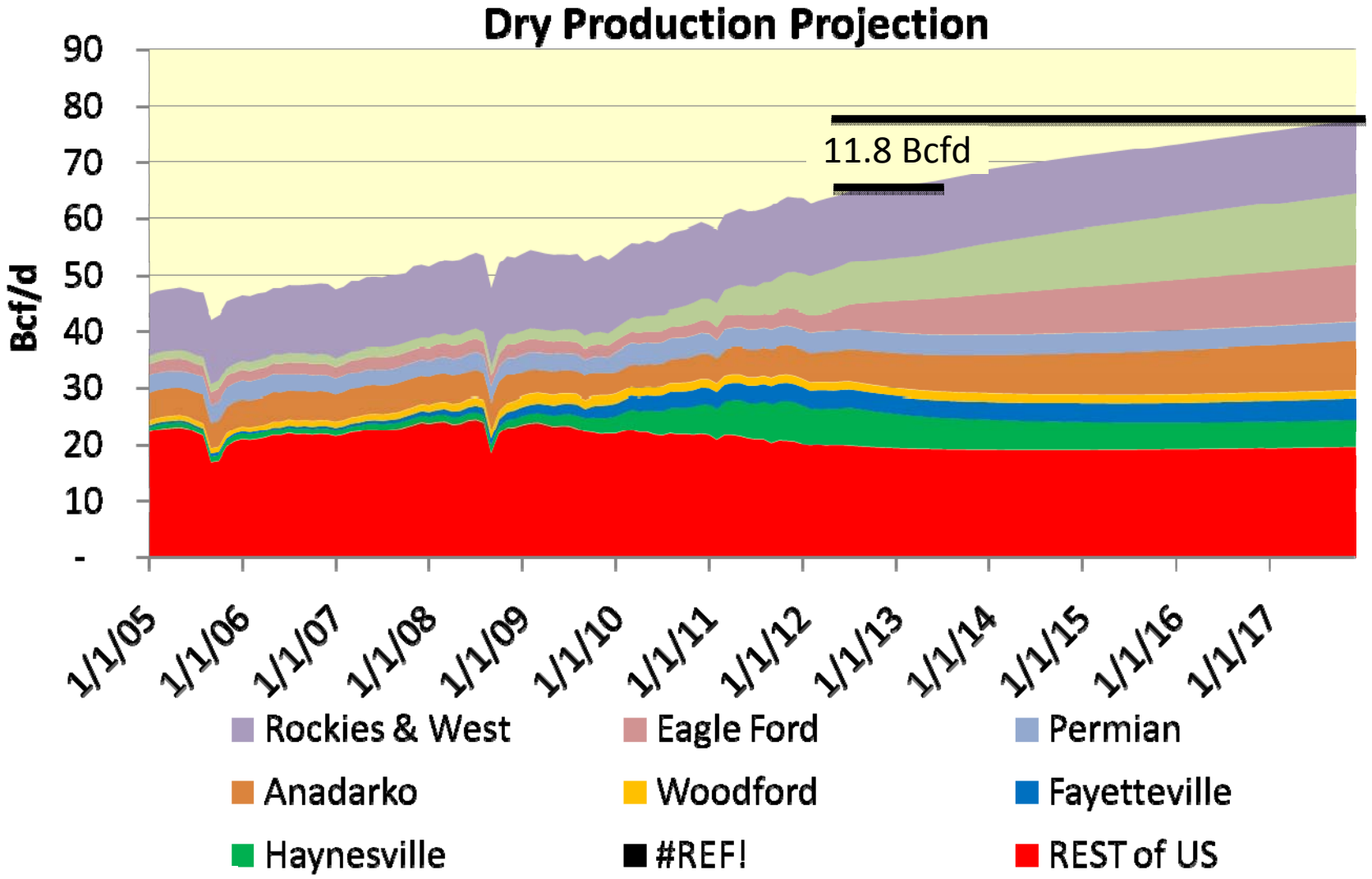


Falling NGL Prices Have Minimal Impacts In Liquids Rich Areas



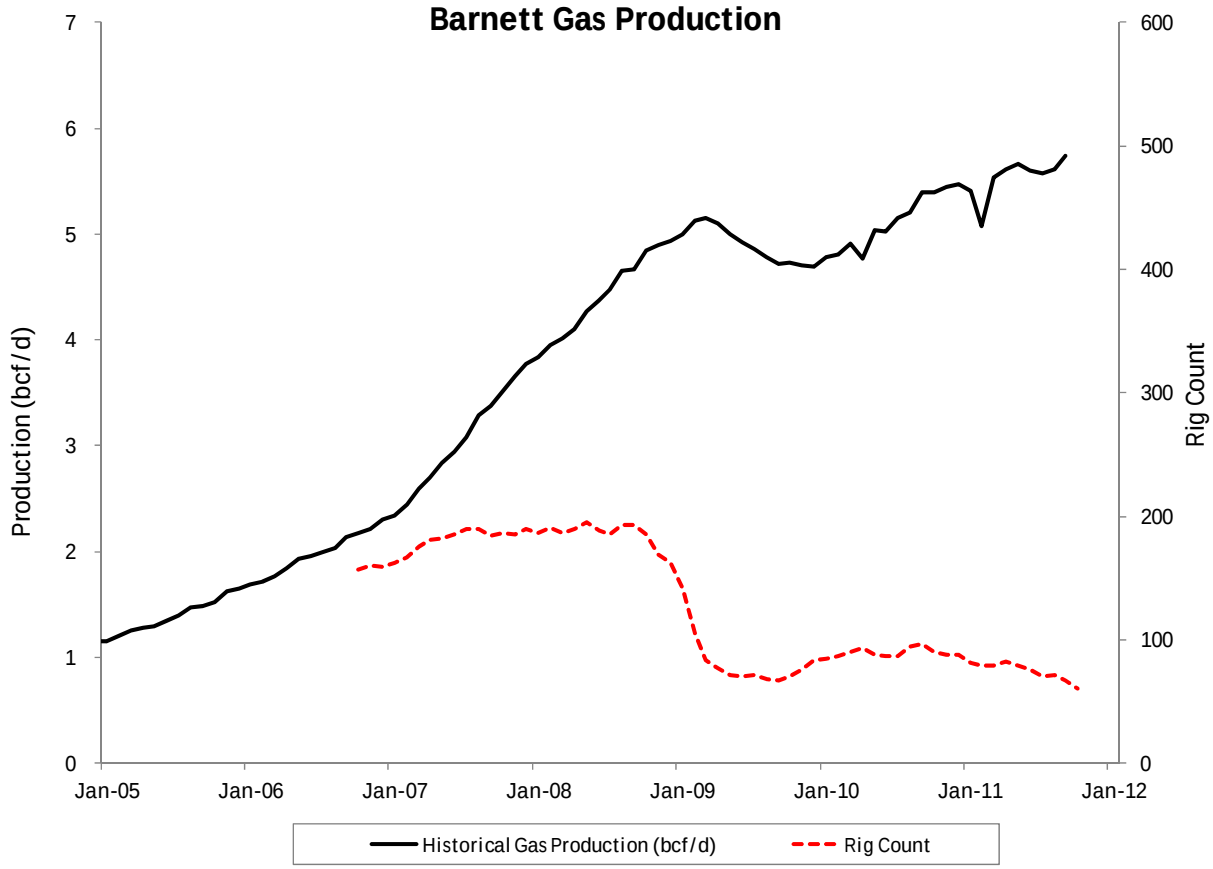
Source: Ponderosa Advisors LLC

Dry Natural Gas Production Is Expected To Grow



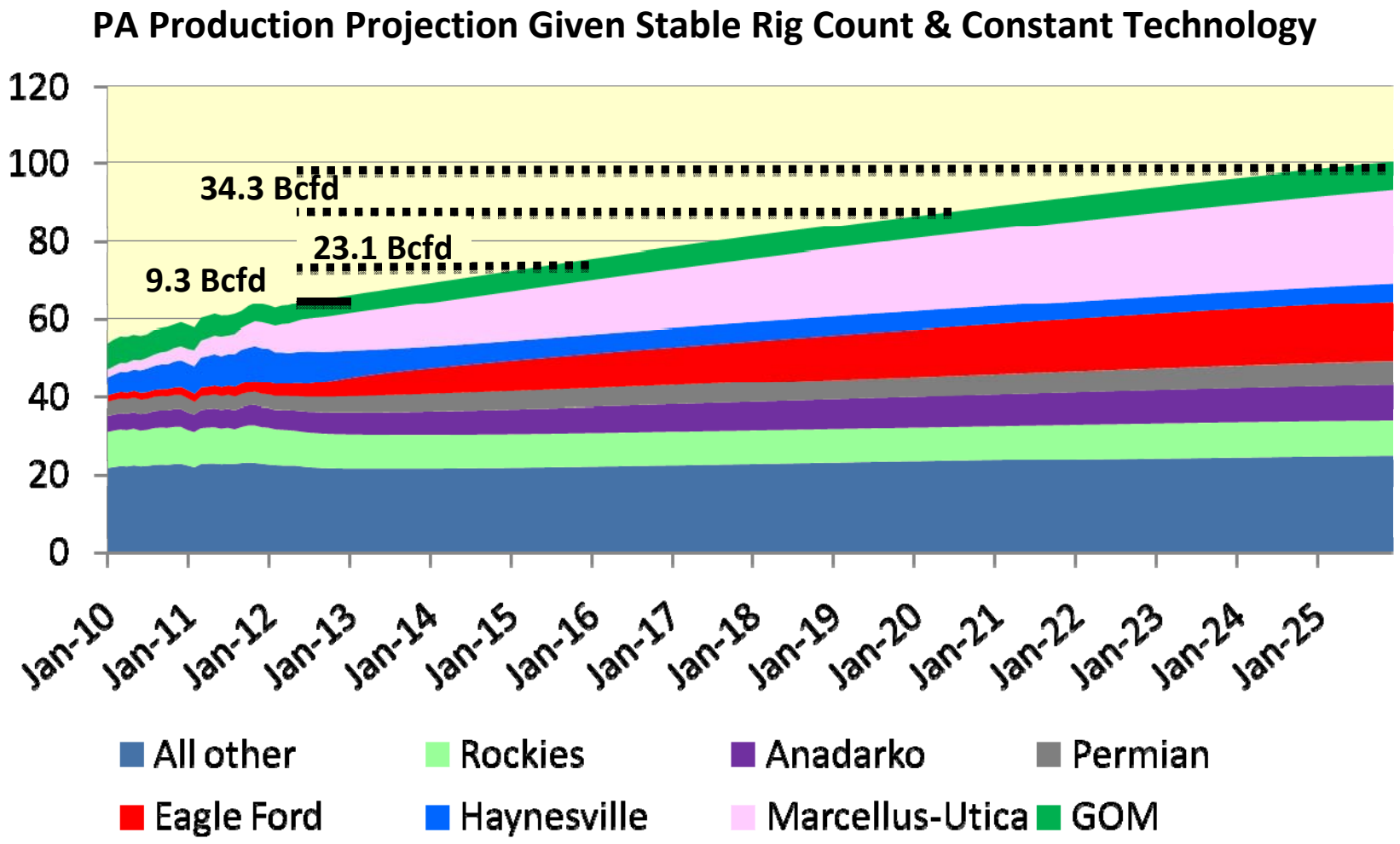
Source: Ponderosa Advisors LLC

Barnett – Model for Future Shale Development



Source: HPDI, RigData, TPH Estimates
Dave Pursell, Tudor Pickering Holt & Co., *Macro Natural Gas and Oil Thoughts* presentation, May 2, 2013

If Exploration Is Maintained, The U.S. Produces A Lot of Natural Gas



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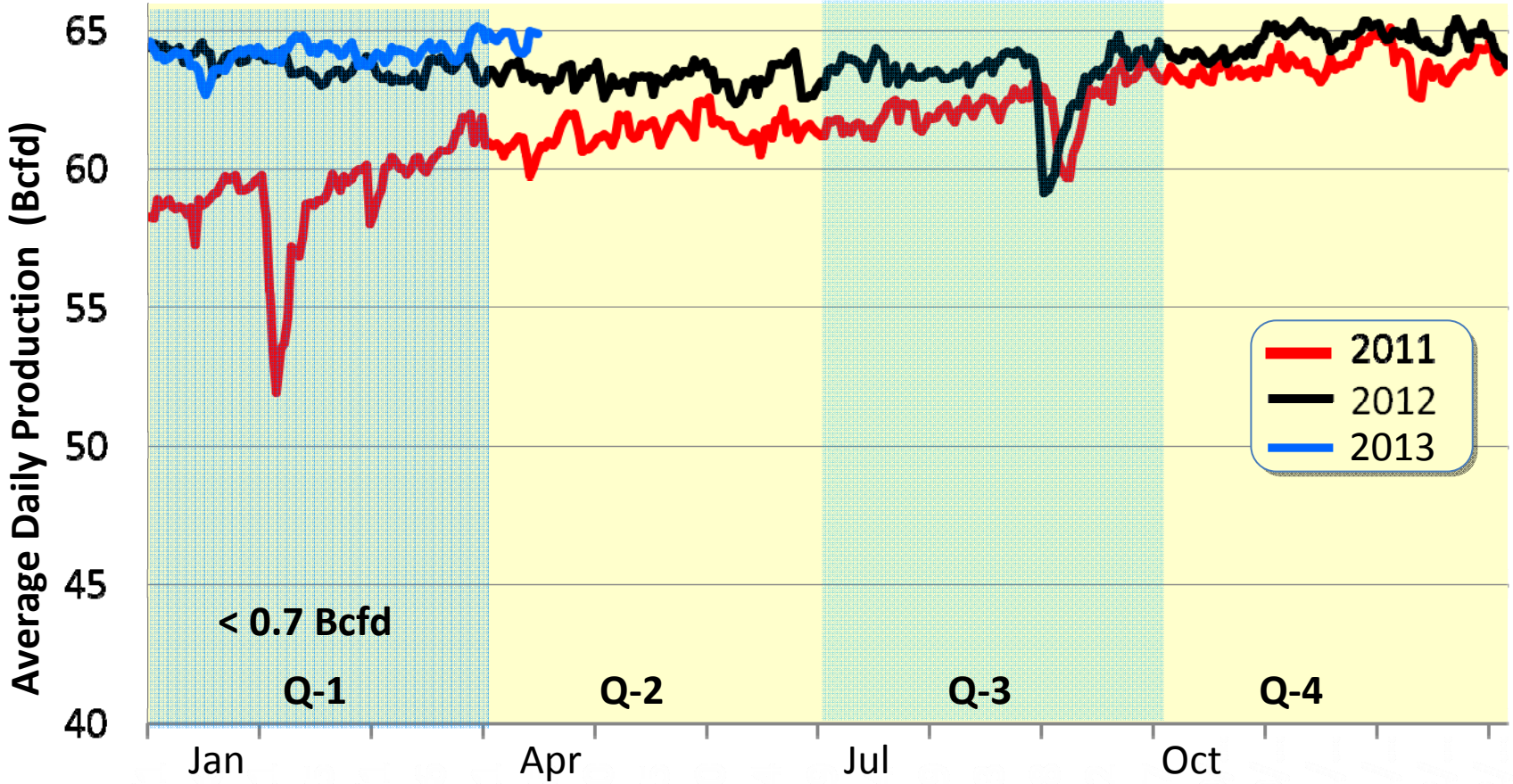
Source: Ponderosa Advisors LLC

US Production Is Up From 2012 By Almost 400 MMcfd

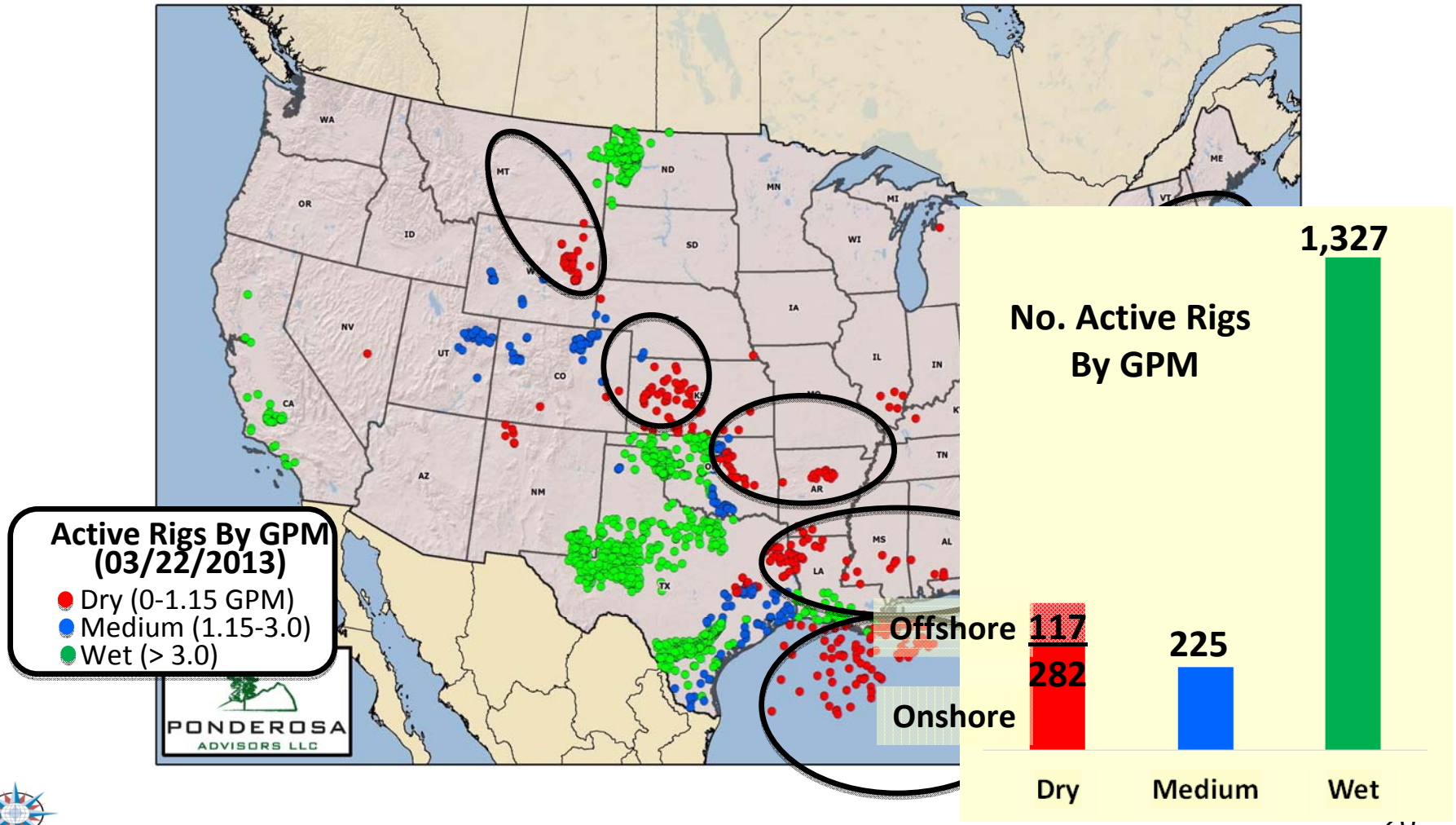
Comparison of Dry Production



Data through January 18, 2013

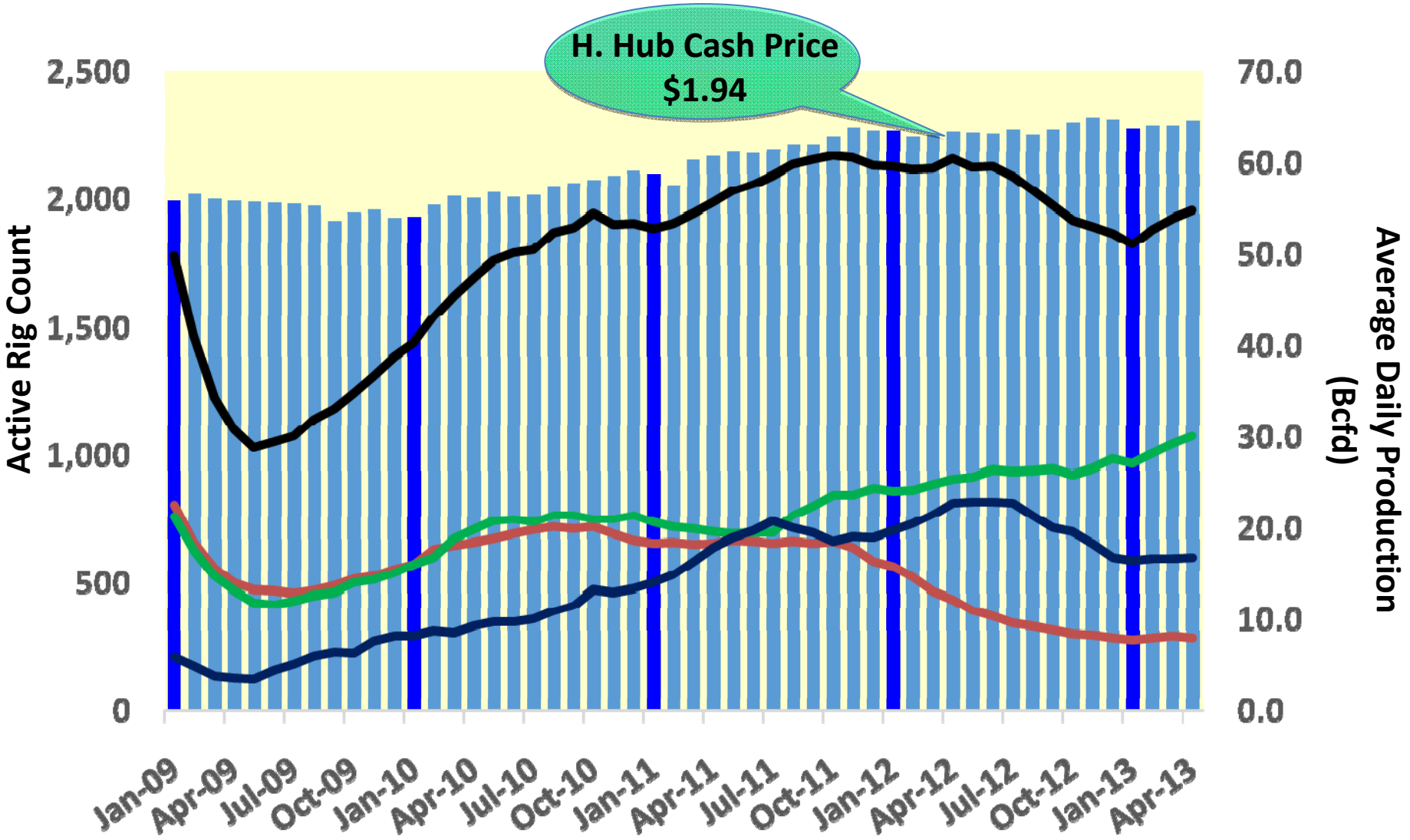
Source: Ponderosa Advisors LLC

15% Onshore Active Rigs Are Working In Dry Gas Areas



Source: Ponderosa Advisors LLC

Production Grows Despite A Decline In “Natural Gas” Drilling



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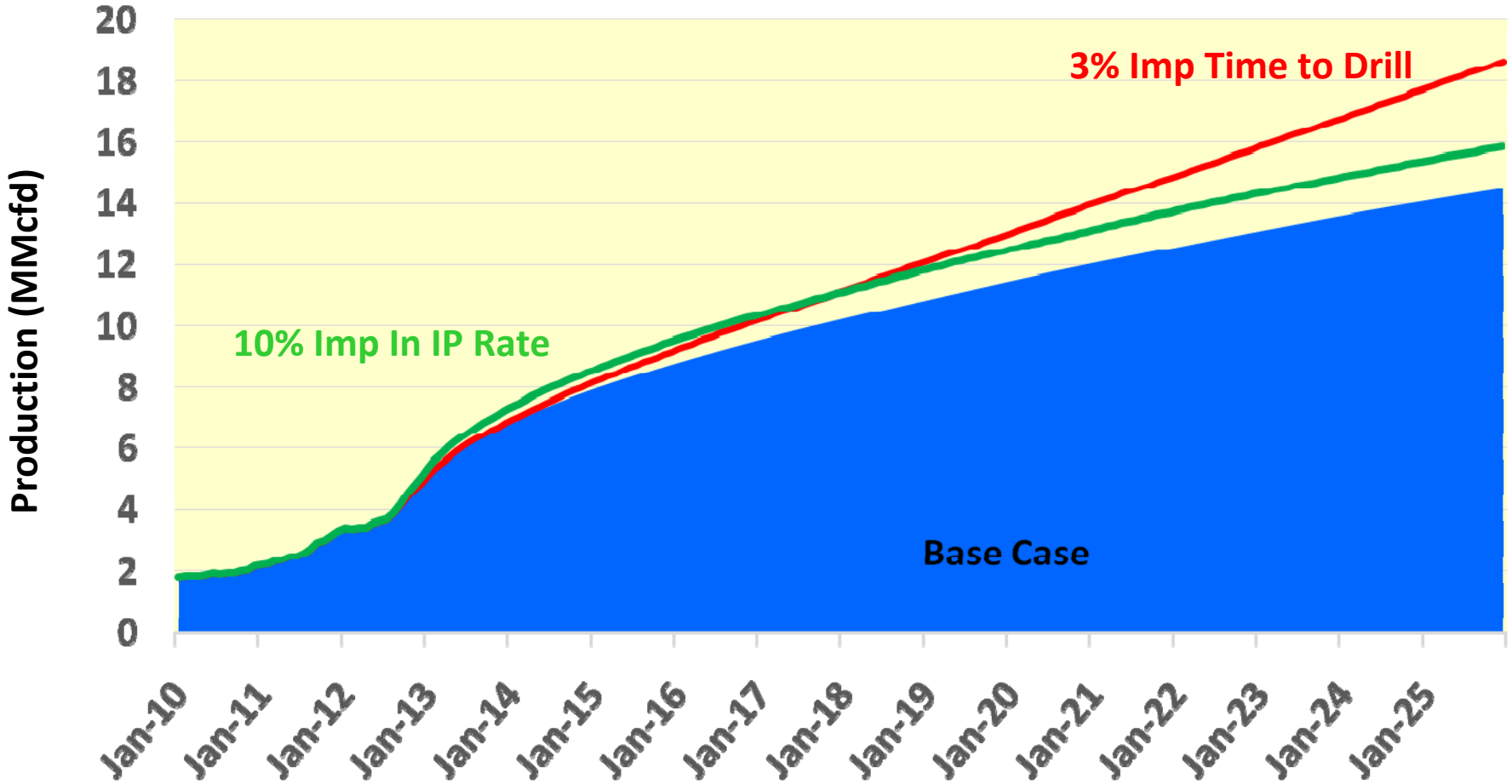
Source: Ponderosa Advisors LLC

Faster Drilling Times Yield More Wells, More Production



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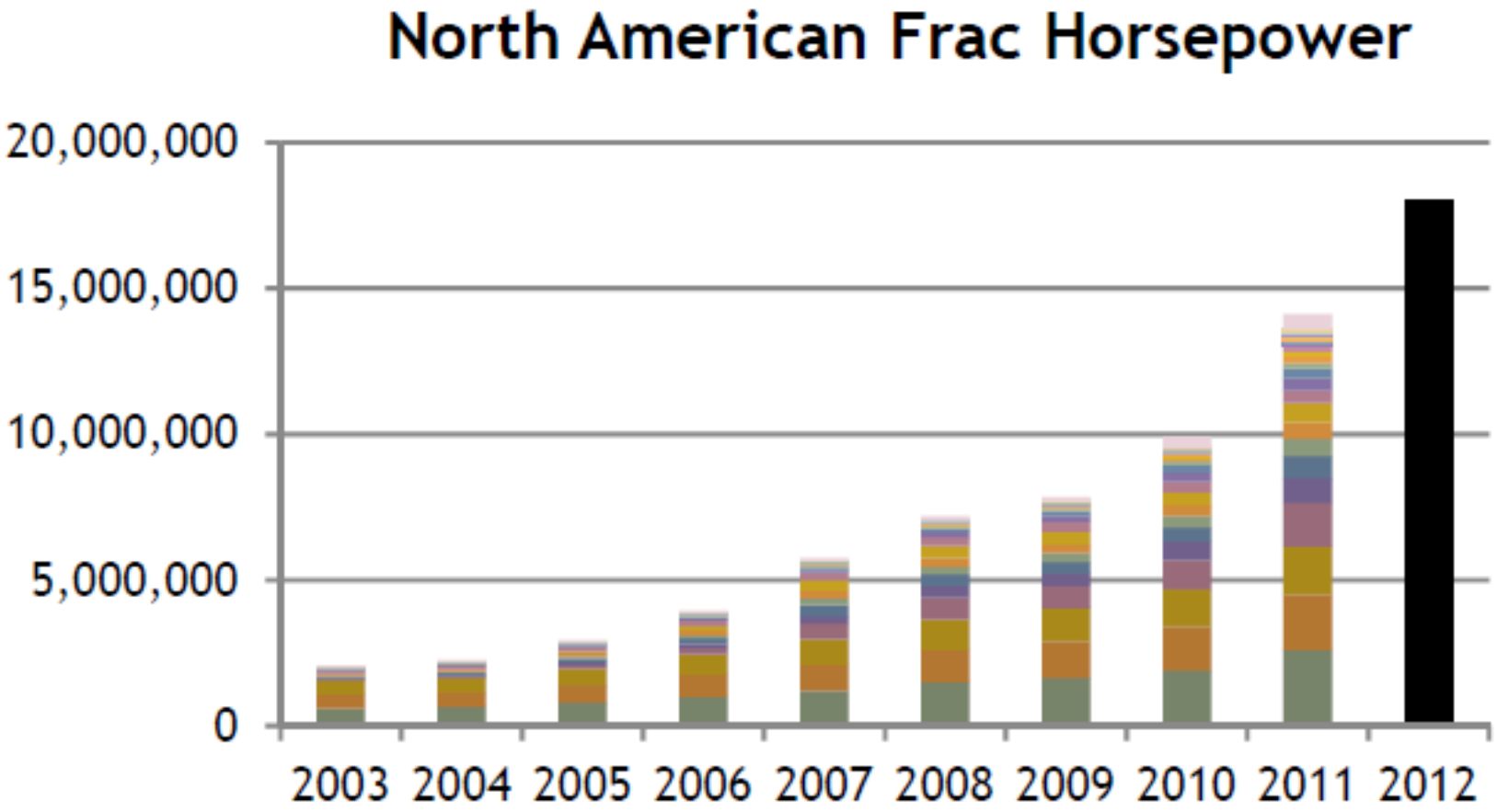
Source: Ponderosa Advisors LLC

Fracturing Application Exploded



Source: Chris Wright, Liberty Resources Tuesday Lunch Club Presentation, 3/5/13

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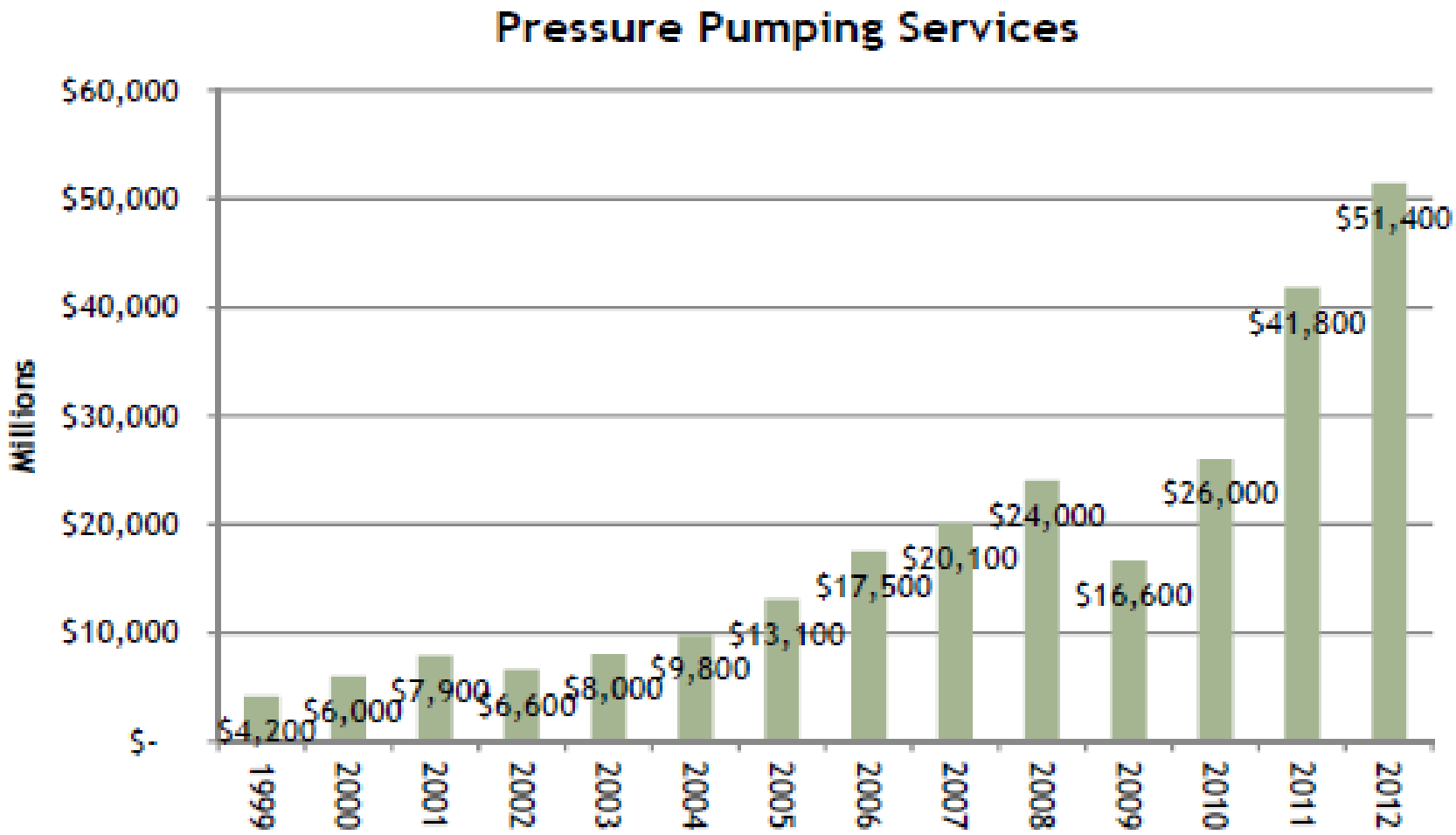
10-fold growth in 10 years



Source: Chris Wright, Liberty Resources Tuesday Lunch Club Presentation, 3/5/13

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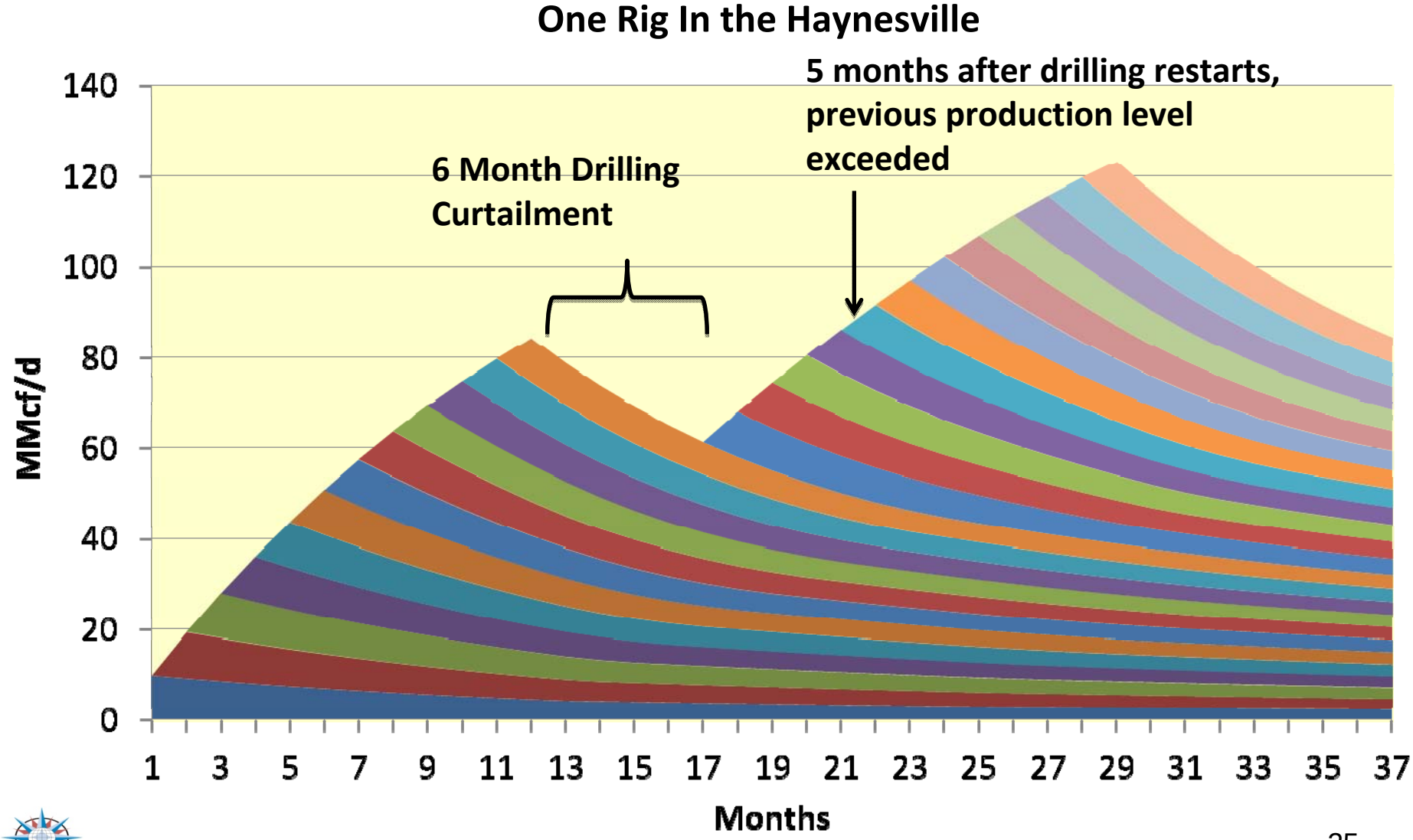
The "Ferrari" Affect Substantially Reduces The Likelihood Of Price Spikes



Source: Ponderosa Advisors LLC

The Impact of Abundant Gas on Sales of Reserves

Date Announced	Buyer	Seller	Value($/MCFE)
6/21/2012	Linn Energy LLC	BP America Production Co.	$1.40
6/1/2012	Vanguard Natural Resources LLC	Antero Resources Corp.	$0.82
5/17/2012	Atlas Resource Partners, L.P.	Titan Operating LLC	$0.74
4/17/2012	Memorial Production Partners LP	Undisclosed	$2.81
4/2/2012	KKR: Premier Natural Resources LLC	WPX Energy Inc.	$1.54
3/15/2012	Atlas Resource Partners, LP	Carrizo Oil & Gas Inc.	$0.69
3/14/2012	Undisclosed	Comstock Resources, Inc.	$2.03
3/9/2012	Linn Energy LLC	Undisclosed	$1.29
		Average	$1.42

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Will the Demand Side Curve Move?

"There is no opportunity for which we can't overcompensate."

Four areas to consider:

1. CNG/NGV vehicle demand
2. Coal to gas electric gen conversion
3. New industrial demand
4. LNG Exports

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1. CNG/Natural Gas Vehicles

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How Many NGVs to Get to 1 BCF Per Day of Demand?

- "The U.S. currently has about 110,000 NGVs on the road (less than 0.1% of total U.S. vehicles), mostly owned by fleets."
- "To get to 1 BCF per day would mean a roughly ten-fold increase in the number of U.S. NGVs."
- It will take the right incentives and plenty of time.
- Let's be aggressive and say 1 BCF per day of demand by 2020.

Source: Raymond James & Associates, Inc., Weekly Energy Report 6-13-11

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2. Coal to Gas Electric Generation Fuel Switching

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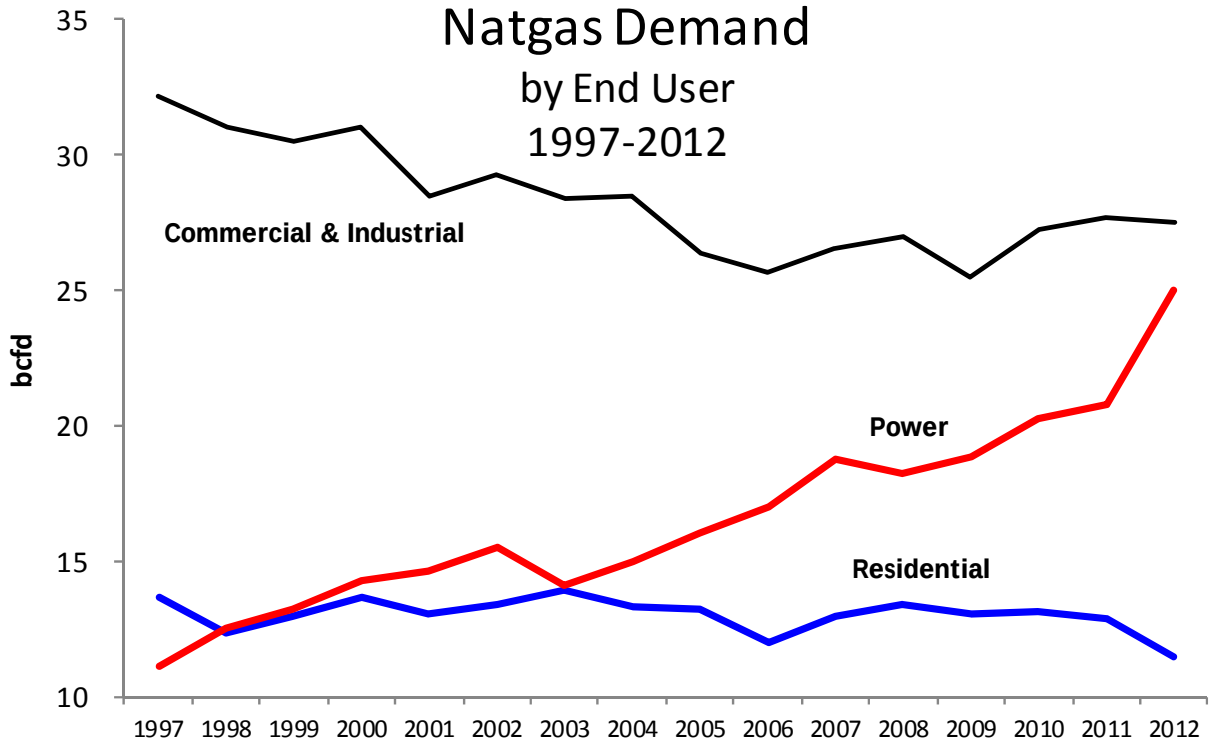
Why Care About Power Generation?

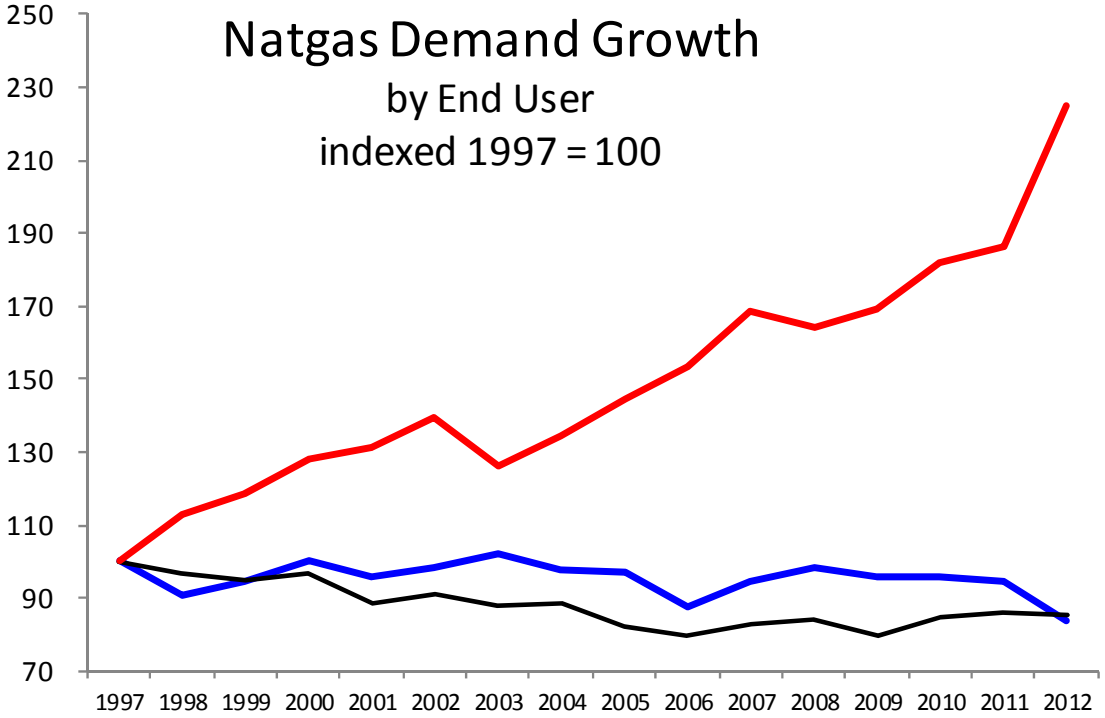
- Power demand historically 20-33% of total US natural gas demand
- Grew to 39% in 2012
- Impressive but power's relative growth even more dramatic



Source: EIA
Dave Pursell, Tudor Pickering Holt & Co., *Macro Natural Gas and Oil Thoughts* presentation, May 2, 2013

Why Care About Power Generation?

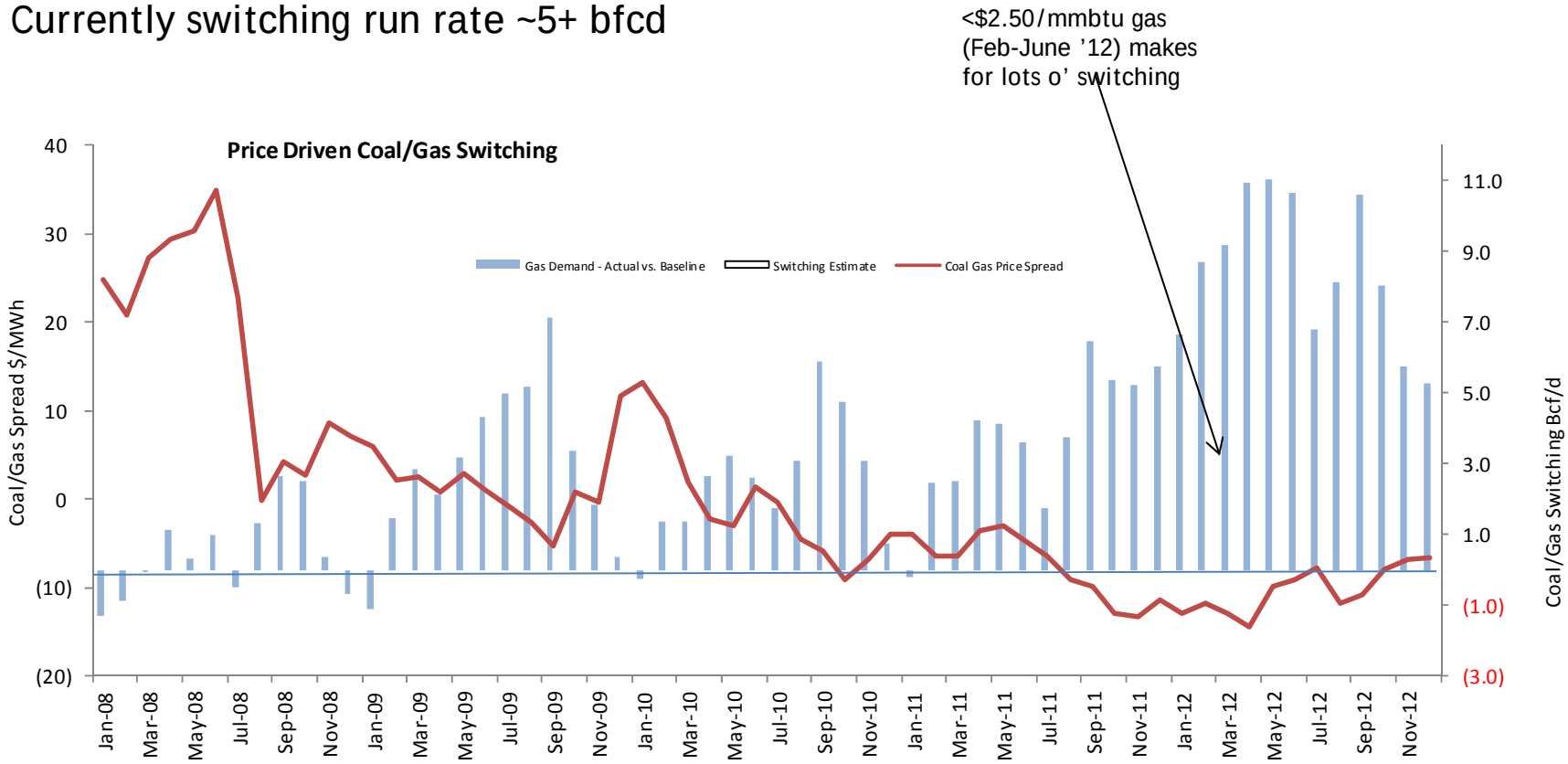
- FY 2012 power gen gas demand increased 21% y/y with total power consumption down -2% y/y
- From 1997 to 2012 power gen gas demand grew 2.25x from 11 bcfd to 25 bcfd
- Impressively demand peaked July 2012 at 36 bcfd



Source: EIA
Dave Pursell, Tudor Pickering Holt & Co., *Macro Natural Gas and Oil Thoughts* presentation, May 2, 2013

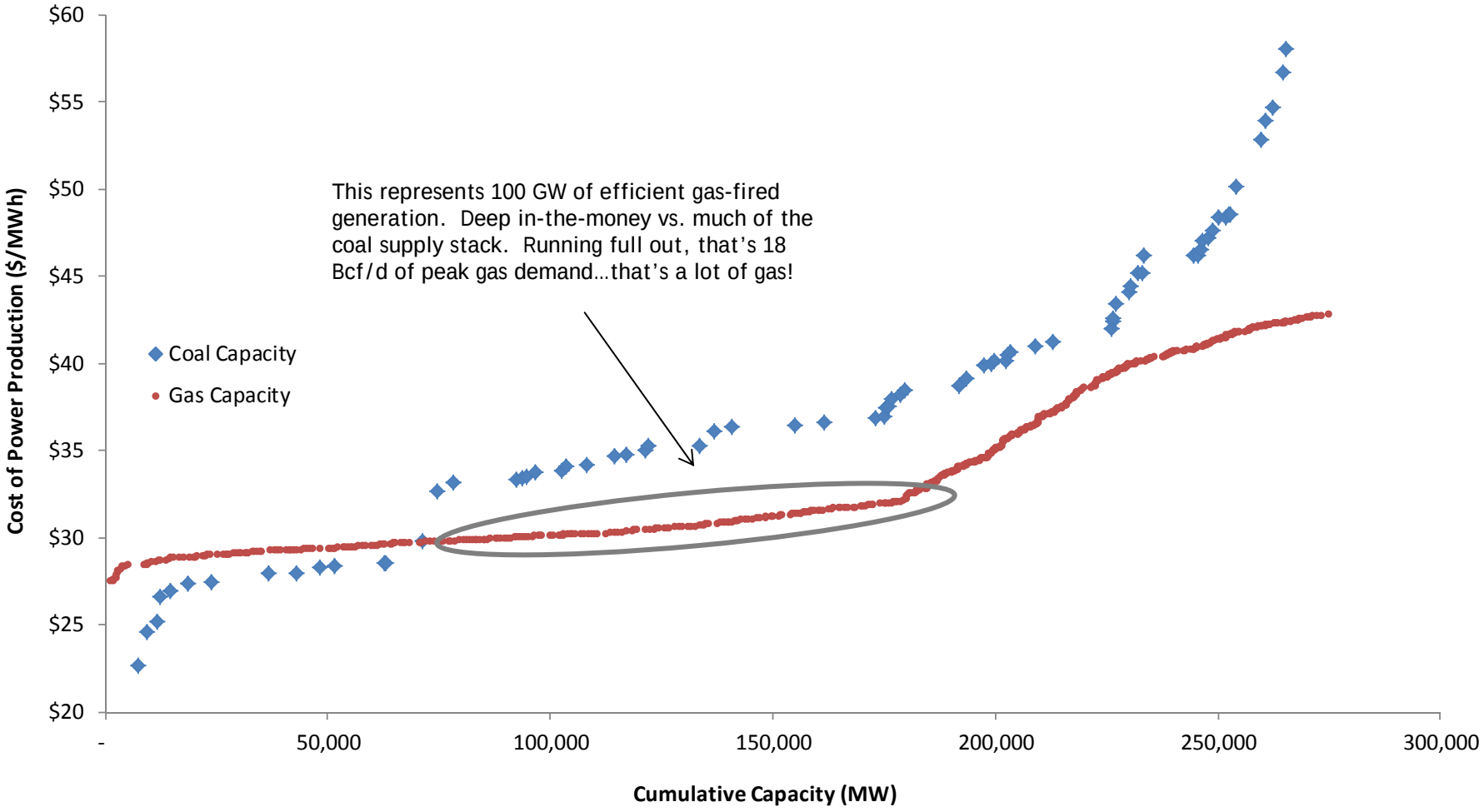
Coal/Gas Switching Price Driven

- FY 2102 Natgas gained an average 8.5 bcfd of power generation market share
- 2012 Switching strong but shy of our 12 bcfd "theoretical" ceiling @ $4/mmbtu gas… got close (Feb-June 2012) but required <$2.50/mmbtu gas
- Currently switching run rate ~5+ bfcd



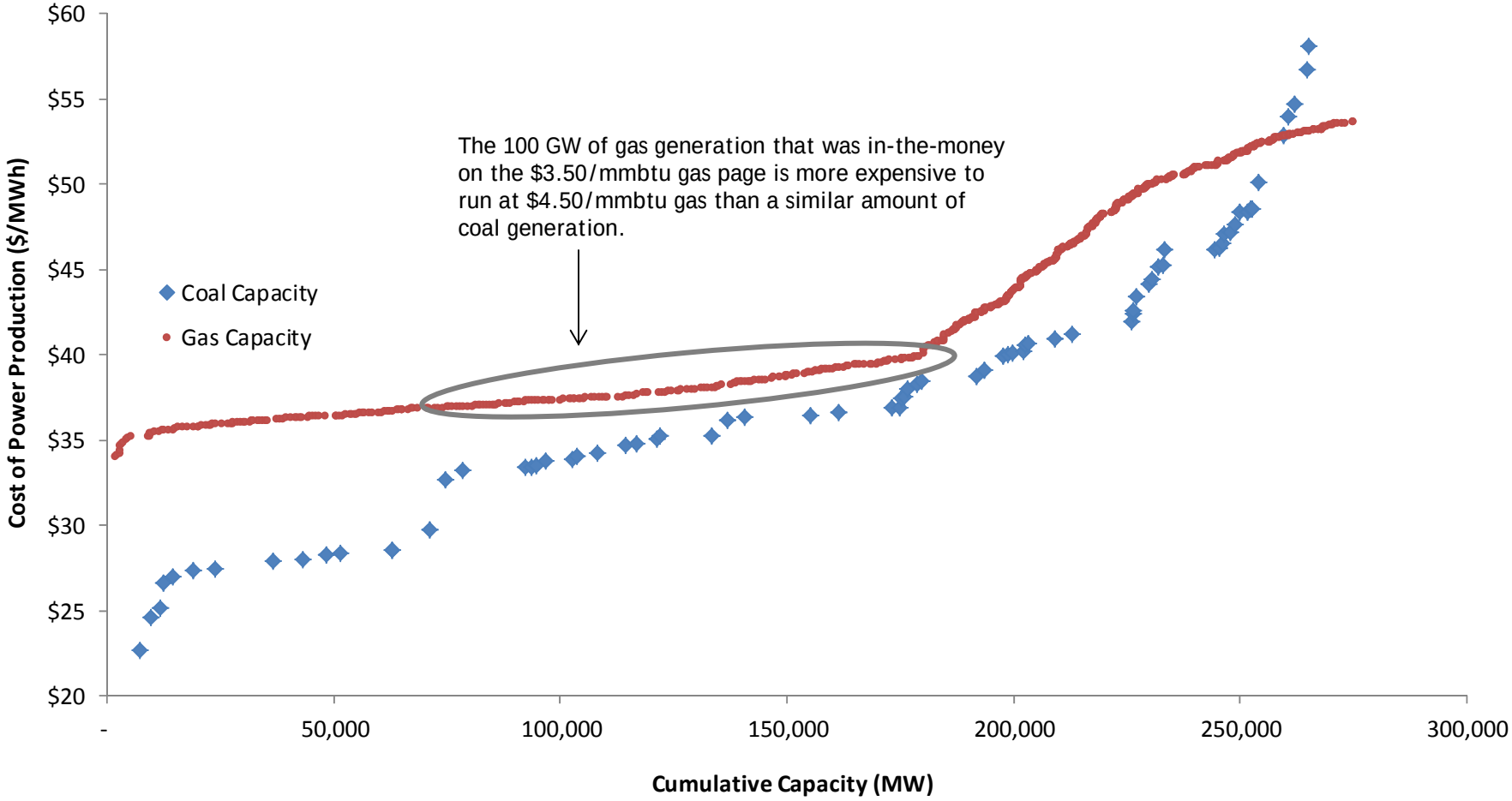
Source: EIA, TPH Research
Dave Pursell, Tudor Pickering Holt & Co., *Macro Natural Gas and Oil Thoughts* presentation, May 2, 2013

Generation Supply Stack - $3.50 Natural Gas Price Deck



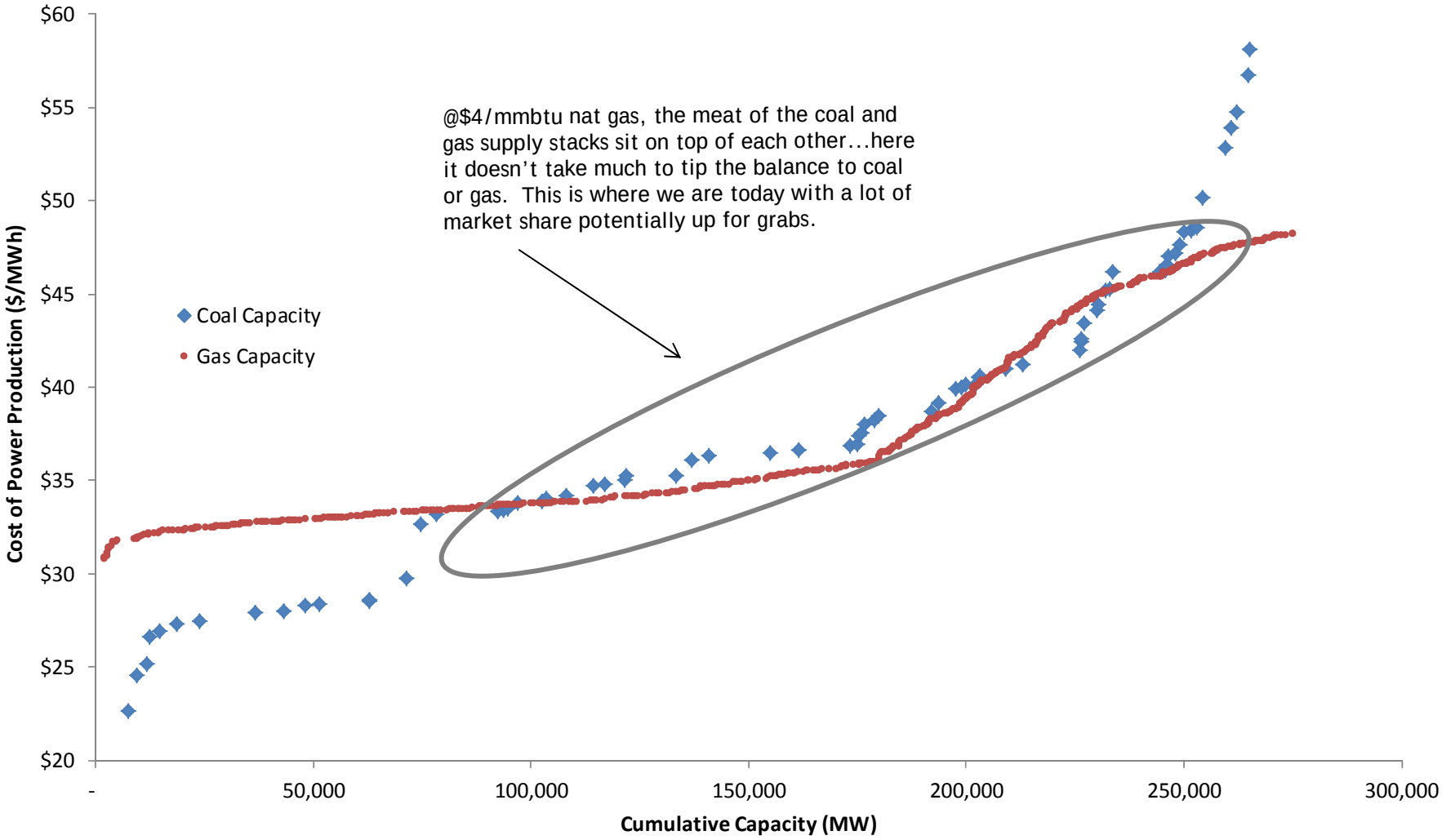
Source: TPHe, EIA, SNL Energy
Dave Pursell, Tudor Pickering Holt & Co., *Macro Natural Gas and Oil Thoughts* presentation, May 2, 2013

Generation Supply Stack - $4.50 Natural Gas Price Deck



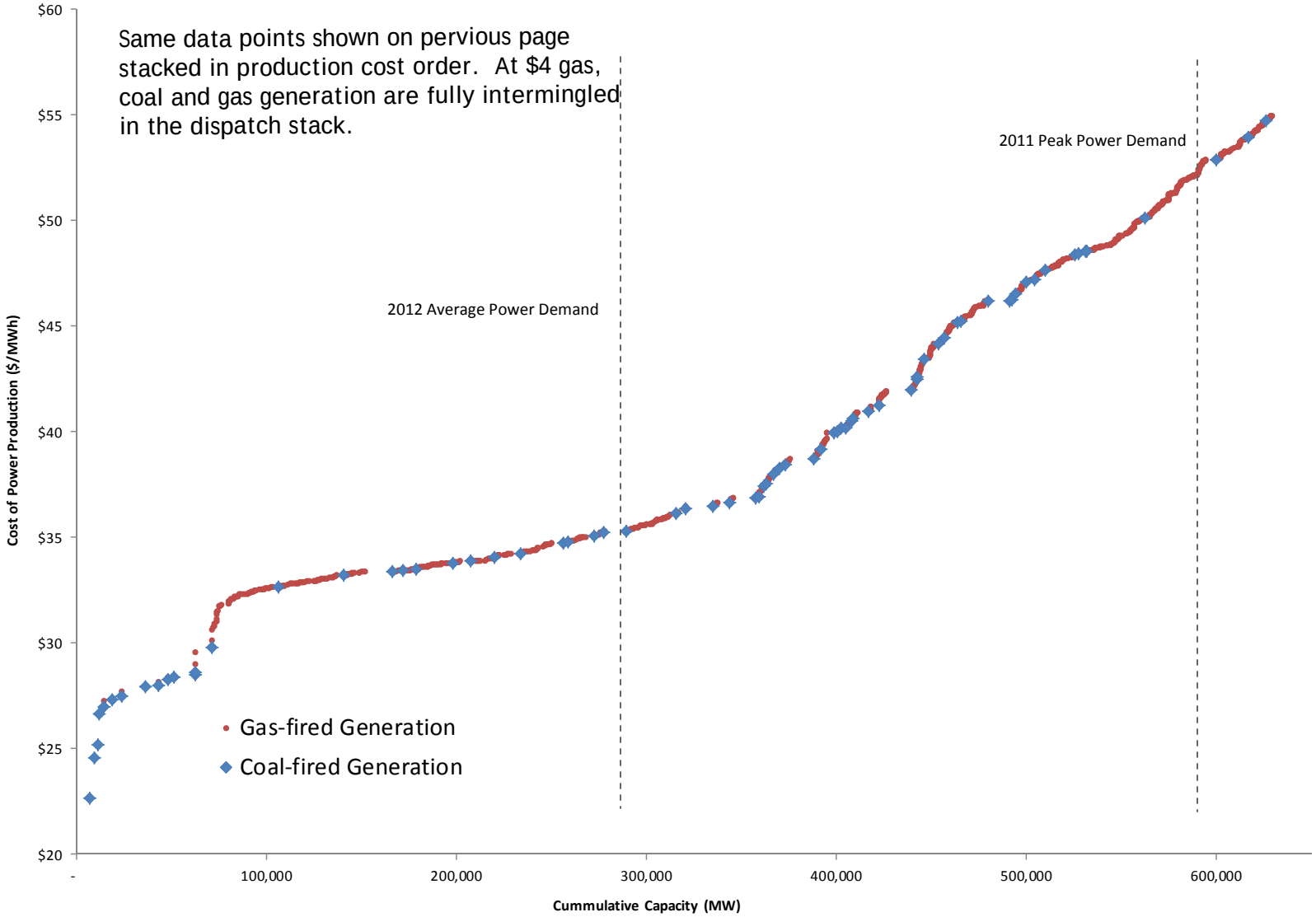
Source: TPHe, EIA, SNL Energy
Dave Pursell, Tudor Pickering Holt & Co., *Macro Natural Gas and Oil Thoughts* presentation, May 2, 2013

Generation Supply Stack - $4.00 Natural Gas Price Deck



Source: TPHe, EIA, SNL Energy
Dave Pursell, Tudor Pickering Holt & Co., *Macro Natural Gas and Oil Thoughts* presentation, May 2, 2013

Power Generation Supply Stack – Coal & $4.00 Gas

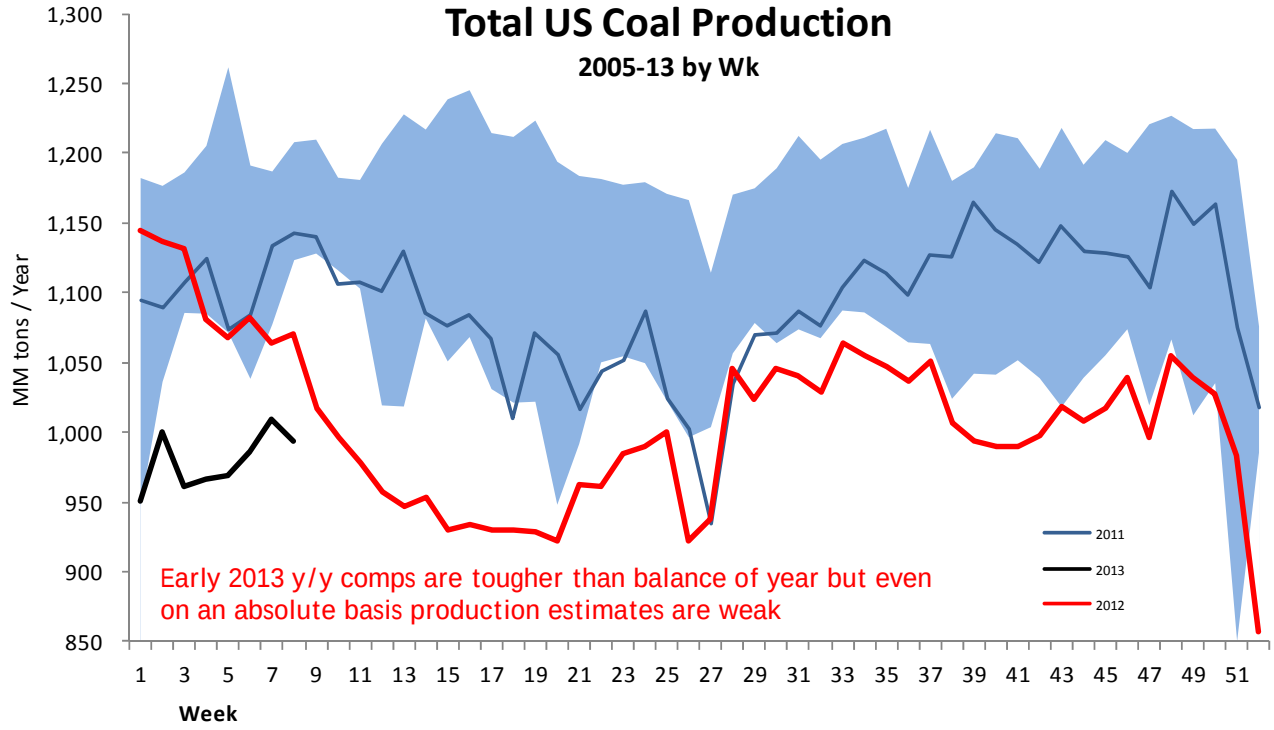


Source: TPHe, EIA, SNL Energy
Dave Pursell, Tudor Pickering Holt & Co., *Macro Natural Gas and Oil Thoughts* presentation, May 2, 2013

US Coal Production

Total US Production (mtpa)	2008	2009	2010	2011	2012	2013
Q1TD	1,173	1,155	1,060	1,106	1,097	979
Q2	1,140	1,045	1,059	1,052	950	
Q3	1,177	1,063	1,100	1,087	1,029	
Q4	1,182	1,022	1,090	1,124	1,001	
FY	1,170	1,068	1,082	1,093	1,008	

Year / Year Change	2009	2010	2011	2012	2013
Q1TD	-2%	-8%	4%	-1%	-11%
Q2	-8%	1%	-1%	-10%	
Q3	-10%	3%	-1%	-5%	
Q4	-14%	7%	3%	-11%	
FY	-9%	1%	1%	-8%	-11%



Source: Dave Pursell, Tudor Pickering Holt & Co., *Macro Natural Gas and Oil Thoughts* presentation, May 2, 2013

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End of New Coal?

- "Based on today's energy fundamentals, the rational economic decision is to shutter inefficient coal plants and replace them with natural gas combined-cycle power plants."[1]

[1] *Coal's burnout*, Washington Post, January 2, 2011

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3. Industrial Demand Growth
(Chemical, Manufacturing, Ethane Crackers, etc.)

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The Ammonia Story

- Current approximate economics
  - Ammonia worth $600 per ton in world market
  - Can be produced for $180 per ton at current U.S NYMEX natural gas price strip
- 14 Ammonia plants closed in the U.S. between 1998 and 2006 thanks in part to high natural gas prices
- Top 5 world producers would like to build new facilities in the U.S.
- 1 ammonia plant can consume as much as 100,000 MMBtu per day

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Dow Exec Sees 90 Manufacturing Projects Planned Using 7 Bcf/d

- "We believe the increase demand will be seen as early as 2015-2020."*
- Manufacturing industry is concerned about "the undisciplined export of liquefied natural gas".
- US manufacturing industry will not support LNG exports

Source: NGI's *Daily* Gas Price Index, October 25, 2012

*George Blitz, Vice President of Dow's Energy and Climate Change Division

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North American Nitrogen Project Activity

Company	Feedstock	Proposed Location (s)	Base NH3 Capacity (Mstpy)	Primary Product Mix For Use/Sale			(a) Probability	Target Date
				NH3	Urea	UAN		
New Greenfield Sites								
Agrium	Nat gas	Midwest	?	?	?	?	?	2016-17
CHS	Nat gas	ND	850	X	X	X	B	2016-17
Cronus	Nat gas	Il or IA	?	?	?	?	?	2016-17
FNA	Nat gas	Canada	?	?	?	?	C	?
IFFCO, others	Nat gas	Becancoeur PQ	810	-	1375	-	C	2016-17
MFC	Nat gas	IN	850	X	X	?	B	2016-17
ND Corn Growers	Nat gas	ND	850	X	X	X	B	2016-17

Items in red are considered firm projects as of the date of this file

(a) Assumed probability as of the date of this file: A = high, B = medium, C = low, ? = no opinion

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Source: Blue, Johnson Associates, Inc.

North American Nitrogen Project Activity (cont'd)

Company	Feedstock	Proposed Location (s)	Base NH3 Capacity (Mstpy)	Primary Product Mix For Use/Sale			(a) Probability	Target Date
				NH3	Urea	UAN		
New Greenfield Sites								
OCI	Nat gas	Wever, IA	850	X	X	1500	A	2015-16
Ohio Valley Resources	Nat gas	IN	850	350	110	1050	C	2016-17
Sumitomo	Nat gas	Midwest	?	?	?	?	?	2017-18
Unspecified 1	Nat gas	Unspecified	?	?	?	?	?	2016-17
Unspecified 2	Nat gas	Unspecified	?	?	?	?	?	2016-17
Various	Nat gas	Midwest	Mini-NH3 plants	X	-	-	B-C	?

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North American Nitrogen Project Activity (cont'd)

Company	Feedstock	Proposed Location (s)	Base NH3 Capacity (Mstpy)	Primary Product Mix For Use/Sale			(a) Probability	Target Date
				NH3	Urea	UAN		
Brownfield Sites								
Agrifos et al	Nat gas	Pasadena, TX	?	?	?	?	?	?
Agrium	Nat gas	Borger, TX	+135	-275	+705	-	A	2014-15
Agrium	Nat gas	Redwater, AB	-	-110	+190	-	A	2014-15
AUM	Nat gas	Trinidad	810	-	1375	-	B	2015-16
CF	Nat gas	D'ville, LA	+1275	+185	+685	+1770	A	2014-16
CF	Nat gas	Port Neal, IA	+850	+80	+1350	-	A	2014-16

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Source: Blue, Johnson Associates, Inc.

North American Nitrogen Project Activity (cont'd)

Company	Feedstock	Proposed Location (s)	Base NH3 Capacity (Mstpy)	Primary Product Mix For Use/Sale			(a) Probability	Target Date
				NH3	Urea	UAN		
Brownfield Sites								
Dyno-Cornerstone	Nat gas	Waggaman, LA	850	850	-	-	A	2016
Koch	Nat gas	Existing Sites	-	-	?	?	?	2015-16
LSB	Nat gas	El Dorado, AR	+385	X	-	-	B	2016-17
Mosaic	Nat gas	NOLA	+700	X	-	-	B-C	2015-16
PES	Nat gas	PA	?	?	X	X	?	2016-17
Rentech	Nat gas	E. Dubuque, IL	+70	?	+20	?	A	2013-14
Yara	Nat gas	Belle Plaine SK	+850	-	+1450	-	A	2016-17

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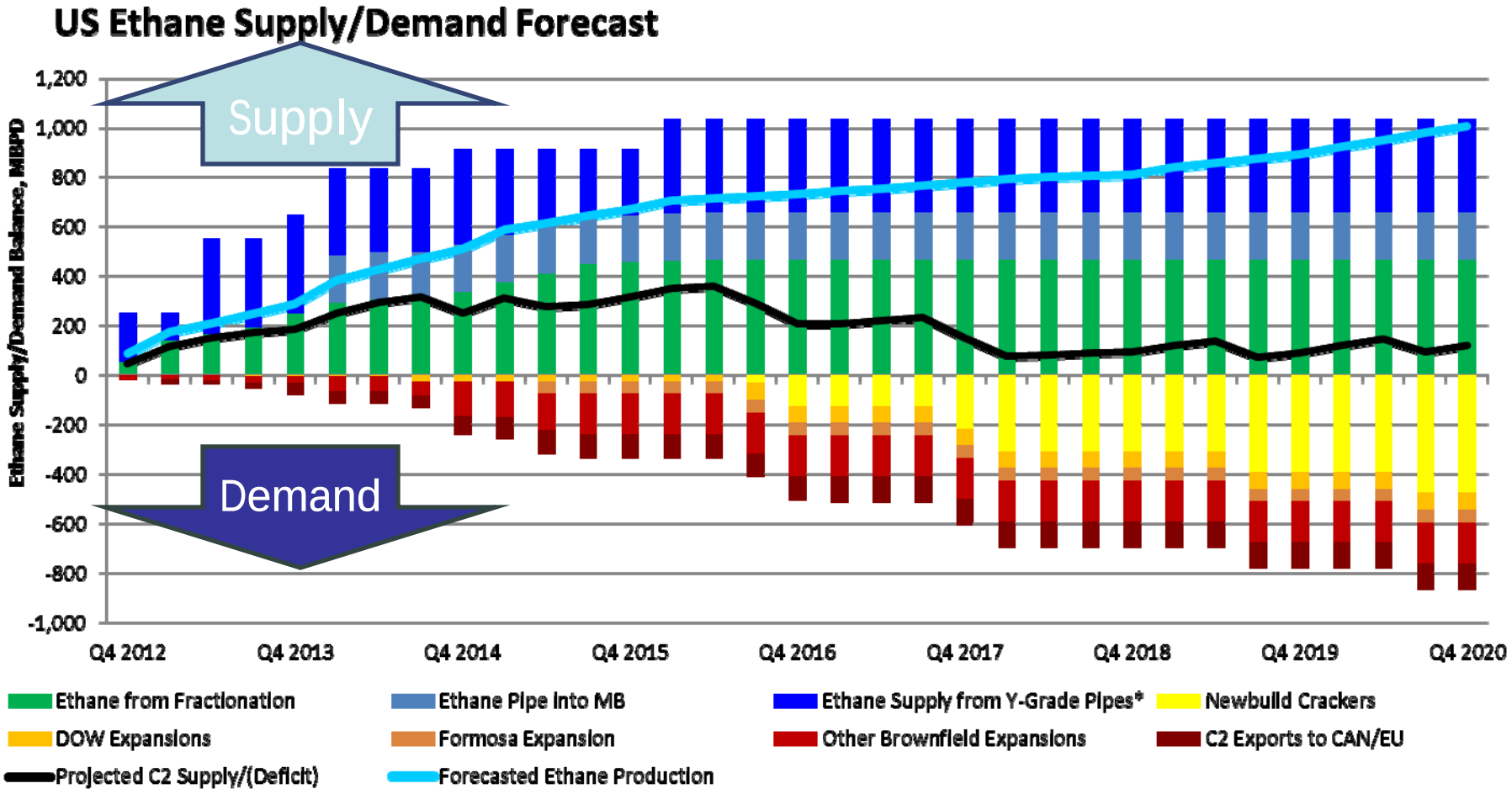
Source: Blue, Johnson Associates, Inc.

Ethane Supply Gets to Gulf Coast before Demand

- Given lengthy lead times for cracker construction (5-7 years), we expect an ethane glut in 2H 2013-2018. We assume all potential ethylene projects are constructed.



Source: SEC filings, company press releases, Dave Pursell, Tudor Pickering Holt & Co., *Macro Natural Gas and Oil Thoughts* presentation, May 2, 2013

Note: Dark blue bar indicates pipe capacity for which corresponding fractionation has not yet been announced.

Nucor EnCana – A Creative Solution

- A price protection deal for Nucor Steel
- $3.6 billion 20 year investment in 4,000 wells located in western Colorado
- Lack of counterparty creditworthiness drove the structure of the deal
- A financial investment/partnership in drilling and development was the only solution for Nucor
- Nucor will sell the gas in western Colorado and use the cash to purchase like volumes in Louisiana
- This deal structure allowed for the phased development of a $1.4 billion DRI steel mill
- The EnCana Nucor deal is responsible for all of EnCana's 5 drilling rigs in western Colorado and will eventually increase to 8 rigs

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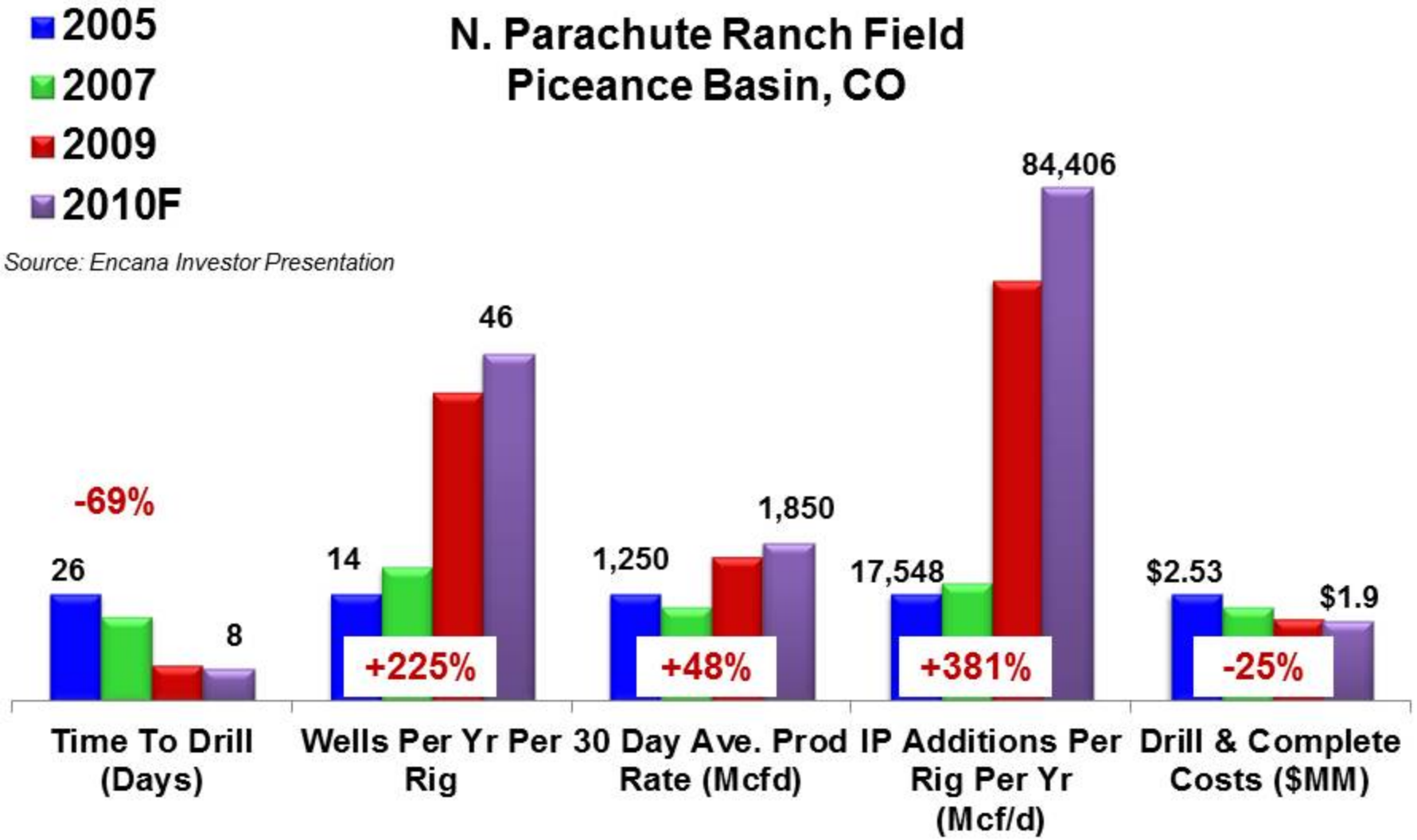
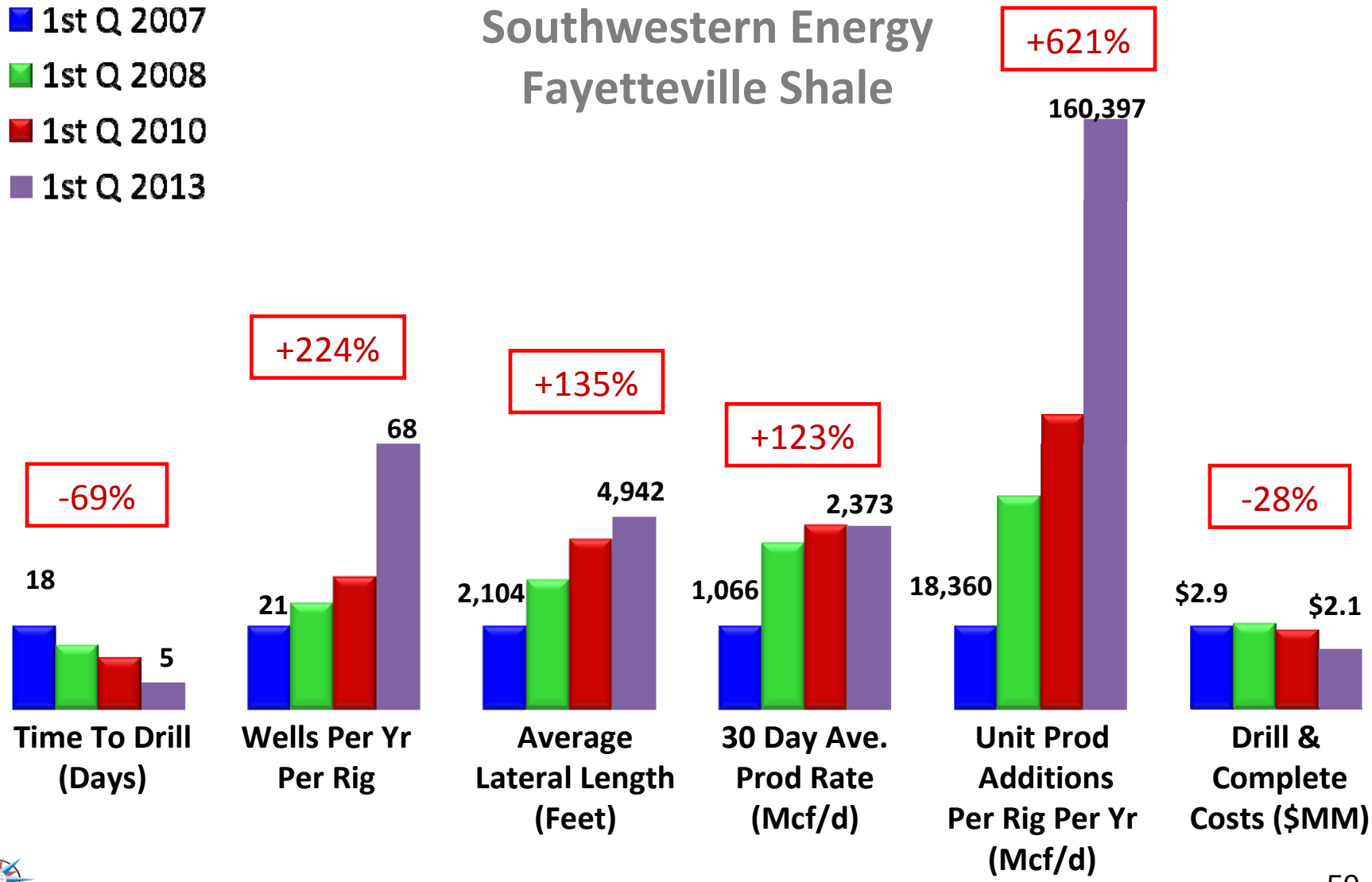
Encana's "Gas Factory" Yields Similar Gains



Drilling Rig Productivity Continues To Improve



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Source: Southwestern Energy Financials

4. LNG Exports

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Applications Received by DOE/FE to Export Domestically Produced LNG from the Lower-48 States (as of April 2, 2013)

All Changes Since March 7, 2013 Update Are In Red

	Company	Quantity [a]	FTA Applications [b] (Docket Number)	Non-FTA Applications [c] (Docket Number)
1	Sabine Pass Liquefaction, LLC	2.2 billion cubic feet per day (Bcf/d) [d]	Approved (10-85-LNG)	Approved (10-111-LNG)
2	Freeport LNG Expansion, L.P. and FLNG Liquefaction, LLC	1.4 Bcf/d [e]	Approved (10-160-LNG)	Under DOE Review (10-161-LNG)
3	Lake Charles Exports, LLC	2.0 Bcf/d [m]**	Approved (11-59-LNG)	Under DOE Review (11-59-LNG)
4	Carib Energy (USA) LLC	0.03 Bcf/d: FTA 0.01 Bcf/d: non-FTA [f]	Approved (11-71-LNG)	Under DOE Review (11-141-LNG)
5	Dominion Cove Point LNG, LP	1.0 Bcf/d [g]	Approved (11-115-LNG)	Under DOE Review (11-128-LNG)
6	Jordan Cove Energy Project, L.P.	1.2 Bcf/d: FTA 0.8 Bcf/d: non-FTA [g]	Approved (11-127-LNG)	Under DOE Review (12-32-LNG)
7	Cameron LNG, LLC	1.7 Bcf/d [g]	Approved (11-145-LNG)	Under DOE Review (11-162-LNG)
8	Freeport LNG Expansion, L.P. and FLNG Liquefaction, LLC [h]	1.4 Bcf/d [g]	Approved (12-06-LNG)	Under DOE Review (11-161-LNG)
9	Gulf Coast LNG Export, LLC [i]	2.8 Bcf/d [d]	Approved (12-05-LNG)	Under DOE Review (12-05-LNG)
10	Gulf LNG Liquefaction Company, LLC	1.5 Bcf/d [d]	Approved (12-47-LNG)	Under DOE Review (12-101-LNG)
11	LNG Development Company, LLC (d/b/a Oregon LNG)	1.25 Bcf/d [d]	Approved (12-48-LNG)	Under DOE Review (12-77-LNG)
12	SB Power Solutions Inc.	0.07 Bcf/d	Approved (12-50-LNG)	n/a
13	Southern LNG Company, L.L.C.	0.5 Bcf/d [d]	Approved (12-54-LNG)	Under DOE Review (12-100-LNG)
14	Excelerate Liquefaction Solutions I, LLC	1.38 Bcf/d [d]	Approved (12-61-LNG)	Under DOE Review (12-146-LNG)
15	Golden Pass Products LLC	2.6 Bcf/d [d]	Approved (12-88 -LNG)	Under DOE Review (12-156-LNG)
16	Cheniere Marketing, LLC	2.1 Bcf/d [d]	Approved (12-99-LNG)	Under DOE Review (12-97-LNG)
17	Main Pass Energy Hub, LLC	3.22 Bcf/d***	Approved (12-114-LNG)	n/a
18	CE FLNG, LLC	1.07 Bcf/d [d]	Approved (12-123-LNG)	Under DOE Review (12-123-LNG)
19	Waller LNG Services, LLC	0.16 Bcf/d	Approved (12-152-LNG)	n/a
20	Pangea LNG (North America) Holdings, LLC	1.09 Bcf/d [d]	Approved (12-174-LNG)	Under DOE Review (12-184-LNG)
21	Magnolia LNG, LLC	0.54 Bcf/d	Approved (12-183-LNG)	n/a

Applications Received by DOE/FE to Export Domestically Produced LNG from the Lower-48 States (as of April 2, 2013)

All Changes Since March 7, 2013 Update Are In Red

	Company	Quantity [a]	FTA Applications [b] (Docket Number)	Non-FTA Applications [c] (Docket Number)
22	Trunkline LNG Export, LLC	2.0 Bcf/d**	Approved (13-04-LNG)	Under DOE Review (13-04-LNG)
23	Gasfin Development USA, LLC	0.2 Bcf/d	Approved (13-06-LNG)	n/a
24	Freeport-McMoRan Energy LLC	3.22 Bcf/d***	Pending Approval (13-26-LNG)	Under DOE Review (13-26-LNG)
25	Sabine Pass Liquefaction, LLC	0.28 Bcf/d[d]	Pending Approval (13-30-LNG)	Under DOE Review (13-30-LNG)
26	Sabine Pass Liquefaction, LLC	0.24 Bcf/d[d]	Pending Approval (13-42-LNG)	Under DOE Review (13-42-LNG)
	Total of all Applications Received		**29.93 Bcf/d(**) (***)**	**28.54 Bcf/d**

** Lake Charles Exports, LLC (LCE) and Trunkline LNG Export, LLC (TLNG), the owner of the Lake Charles Terminal, have both filed an application to export up to 2.0 Bcf/d of LNG from the Lake Charles Terminal. The total quantity of combined exports requested between LCE and TLNG does not exceed 2.0 Bcf/d (i.e., both requests are not additive and only 2 Bcf/d is included in the bottom-line total of applications received).

*** Main Pass Energy Hub, LLC (MPEH) and Freeport McMoRan Energy LLC (FME), have both filed an application to export up to 3.22 Bcf/d of LNG from the Main Pass Energy Hub. (The existing Main Pass Energy Hub structures are owned by FME). The total quantity of combined FTA exports requested between MPEH and FME does not exceed 3.22 Bcf/d (i.e., both requests are not additive and only 3.22 Bcf/d is included in the bottom-line total of FTA applications received). FME's application includes exports of 3.22 Bcf/d to non-FTA countries and is included in the bottom line total of non-FTA applications received, while MPEH has not submitted an application to export LNG to non-FTA countries.

(a) Actual applications were in the equivalent annual quantities.

(b) FTA – Applications to export to free trade agreement (FTA) countries. The Natural Gas Act, as amended, has deemed FTA exports to be in the public interest and applications shall be authorized without modification or delay.

(c) Non-FTA applications require DOE to post a notice of application in the Federal Register for comments, protests and motions to intervene, and to evaluate the application to make a public interest consistency determination.

(d) Requested approval of this quantity in both the FTA and non-FTA export applications. Total facility is limited to this quantity (i.e., FTA and non-FTA volumes are not additive at a facility).

(e) Lake Charles Exports, LLC submitted one application seeking separate authorizations to export LNG to FTA countries and another authorization to export to Non-FTA countries. The proposed facility has a capacity of 2.0 Bcf/d, which is the volume requested in both the FTA and Non-FTA authorizations.

(f) Carib Energy (USA) LLC requested authority to export the equivalent of 11.53 Bcf per year of natural gas to FTA countries and 3.44 Bcf per year to non-FTA countries.

(g) Jordan Cove Energy Project, L.P. requested authority to export the equivalent of 1.2 Bcf/d of natural gas to FTA countries and 0.8 Bcf/d to non-FTA countries.

(h) DOE/FE received a new application (11-161-LNG) by FLEX to export an additional 1.4 Bcf/d of LNG from new trains to be located at the Freeport LNG Terminal, to non-FTA countries, and a separate application (12-06-LNG) to export this same 1.4 Bcf/d of LNG to FTA countries (received January 12, 2012). This 1.4 Bcf/d is in addition to the 1.4 Bcf/d FLEX requested in dockets (10-160-LNG and 10-161-LNG).

(i) An application was submitted by Gulf Coast on January 10, 2012, seeking one authorization to export LNG to any country not prohibited by U.S. law or policy. On September 11, 2012, Gulf Coast revised their application by seeking separate authorizations for LNG exports to FTA countries and Non-FTA countries.

(j) Total does not include 2.0 Bcf/d

Australia LNG
While we review, they build…

Gladstone Australia's 3 LNG plants represent $60 billion in investments

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The Japanese Crude Cocktail Story

- LNG prices in Pacific Basin (ie – Northeast Asia) are closely tied to crude oil prices
- On a Btu equivalent
  - One barrel of crude oil equals approximately 5.8 MMBtu of natural gas
  - Crude oil at $90 per barrel should mean (on a Btu equivalent) that natural gas is worth $15.52 per MMBtu (today's price approximately $3.20 per MMBtu)
- LNG in Japan sold for an average of $17.70 per MMBtu in September 2012.

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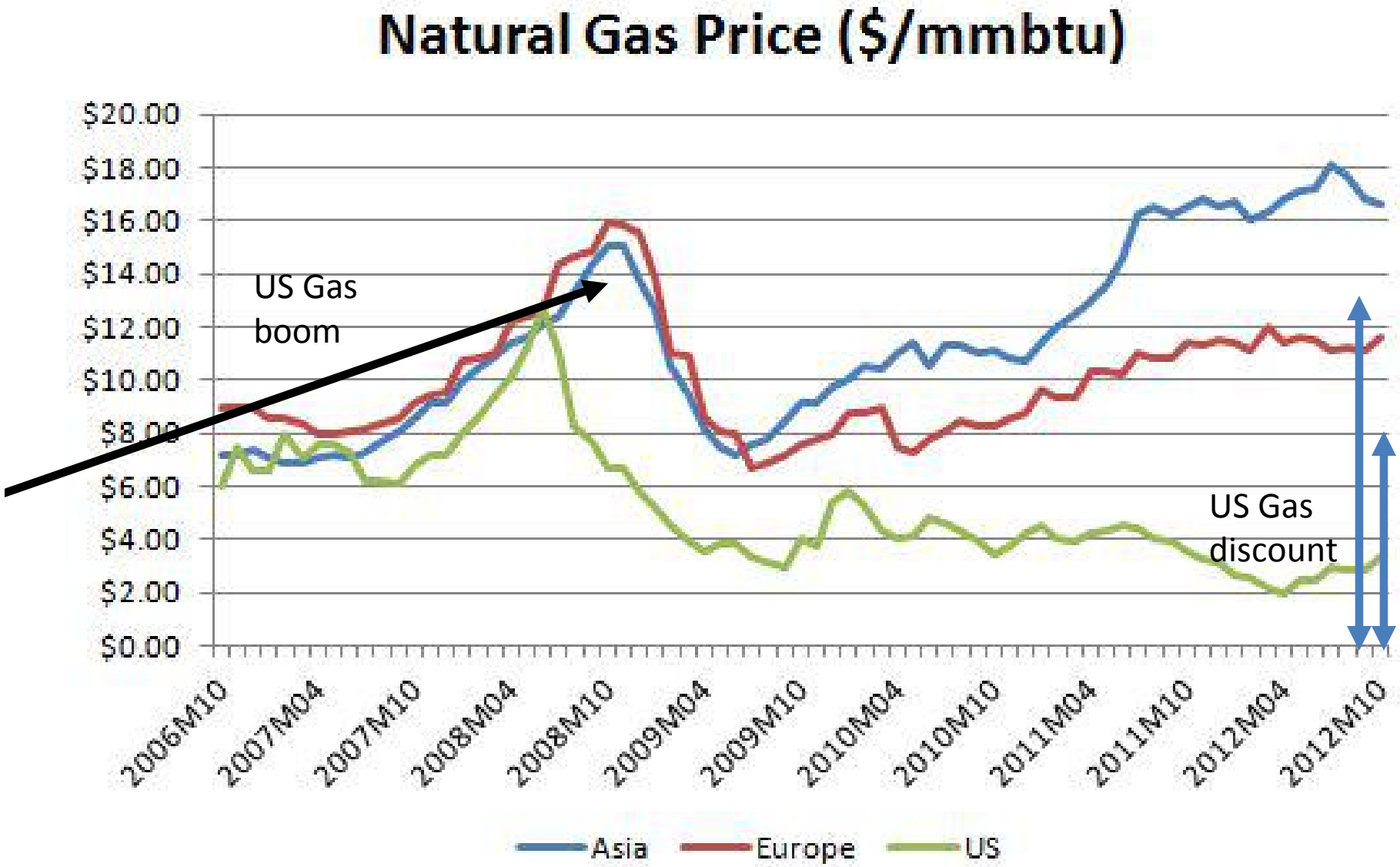
Gas Prices by Region



Source: Chris Wright, Liberty Resources Tuesday Lunch Club Presentation, 3/5/13

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Incremental Demand/Supply Increase By 2020?

	Low Case	High Case
1. CNG/Natural Gas Vehicles	0.5 BCF/day	1.0 BCF/day
2. Coal to Gas	5.0 BCF/day	8.0 BCF/day
3. Industrial Demand Growth	3.0 BCF/day	7.0 BCF/day
4. LNG Exports	3.0 BCF/day	6.0 BCF/day
Incremental Demand Total	**11.5 BCF/day**	**22.0 BCF/day**
Incremental Supply Total*	**15.0 BCF/day**	**25.0 BCF/day**

*Current daily supply is 65 BCF per day.

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Conclusions

- U.S. continues to produce more gas, shale gas revolution was too successful, end-users will benefit
- During the next 3 years, supply will likely exceed demand
- Prices will remain in the $3.00 to $4.00 range, with short period above and below that band during adjustments
- Long term prices depend on demand growth. Without demand growth, supply will continue to be long and prices relatively low.
- A significant demand response can't occur for at least 3-5 years

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Conclusions (cont'd)

- Infrastructure investment in the 4 areas of potential new demand (CNG/NGV, coal to gas, industrial demand growth, LNG exports) could take 5-8 years to be meaningful
- Natural gas liquids will continue to be the driving force in drilling
- BTU value disparity between natural gas and crude oil will continue for many years
- Beware of entities that are "talking their own book" (ie – chemical and manufacturing trade associations, LNG developers, NGV advocates, etc.)
- Exports must become a greater part of the demand equation, with obvious political implications.

Wildcards

- World economy (every one is “talking their own book”)
- Ban on hydraulic fracturing in U.S. (it is a battle city by city, town by town)
- Quad “O”
- The Streetlight Effect

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Fracturing: Big Three Issues

- **Waste Water Disposal**: Re-injection is generally best option. Viable and safe in most all areas.
- **Air Pollution**: Industrial activity on site – burning diesel like farm equipment and possible hazard from methane gas escaping (casing head gas).
- **Community / Landowner issues**. Biggest one in my opinion. Different communities evaluate tradeoffs differently. Benefit sharing is also variable.
- Fracture growth up into groundwater is a hyped but not real issue. Surface handling of water / chemicals is a real issue, as is casing / cement integrity.

Citations for Report

All of the information utilized for this report is a compilation of information pulled from the following data sources:

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Blue, Johnson Associates, Inc.
Chris Wright, Liberty Resources
Office of Fossil Energy
Dave Pursell, Tudor Pickering Holt & Co
Tudor Pickering Holt & Co
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U.S. Department of Energy
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Institute for Energy Research (IER)
Energy Information Administration (EIA)
Bernstein Research
Western Energy Alliance
Platts Gas Daily Report, A McGraw Hill Publication
SEC Filings

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