

# **From the Piceance Basin to the Pacific Rim:**

## Measuring the Impact of the Oil Price Collapse

**Presentation to:**  
Energy & Environment Symposium  
Rifle, CO

By:  
John Harpole

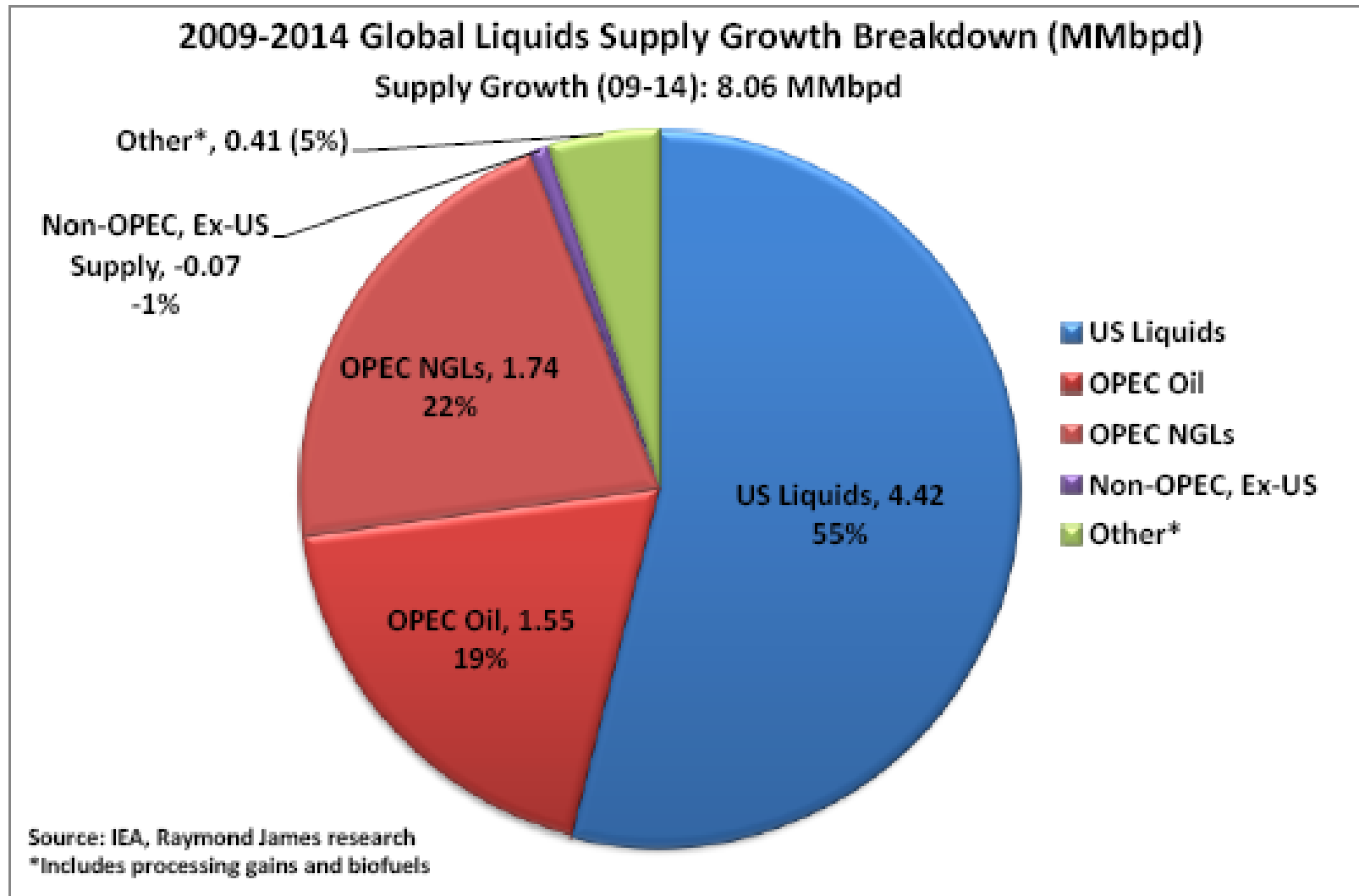


April 29, 2015

# Presentation Outline

- What is Happening? Why?
  - The recent collapse in crude oil prices.
  - The reasons for the price collapse.
- What does it mean for worldwide and U.S. production?

# The House of Saud's Motivation



# The Production War is on!

- On November 27, 2014 at an OPEC meeting in Vienna, the Saudis said,

“Yakfee!”

or

“Enough!”

- They resisted calls from OPEC members Iran, Iraq and Venezuela to reduce the production target of 30 million barrels per day.



Source:

**M**ercator Energy

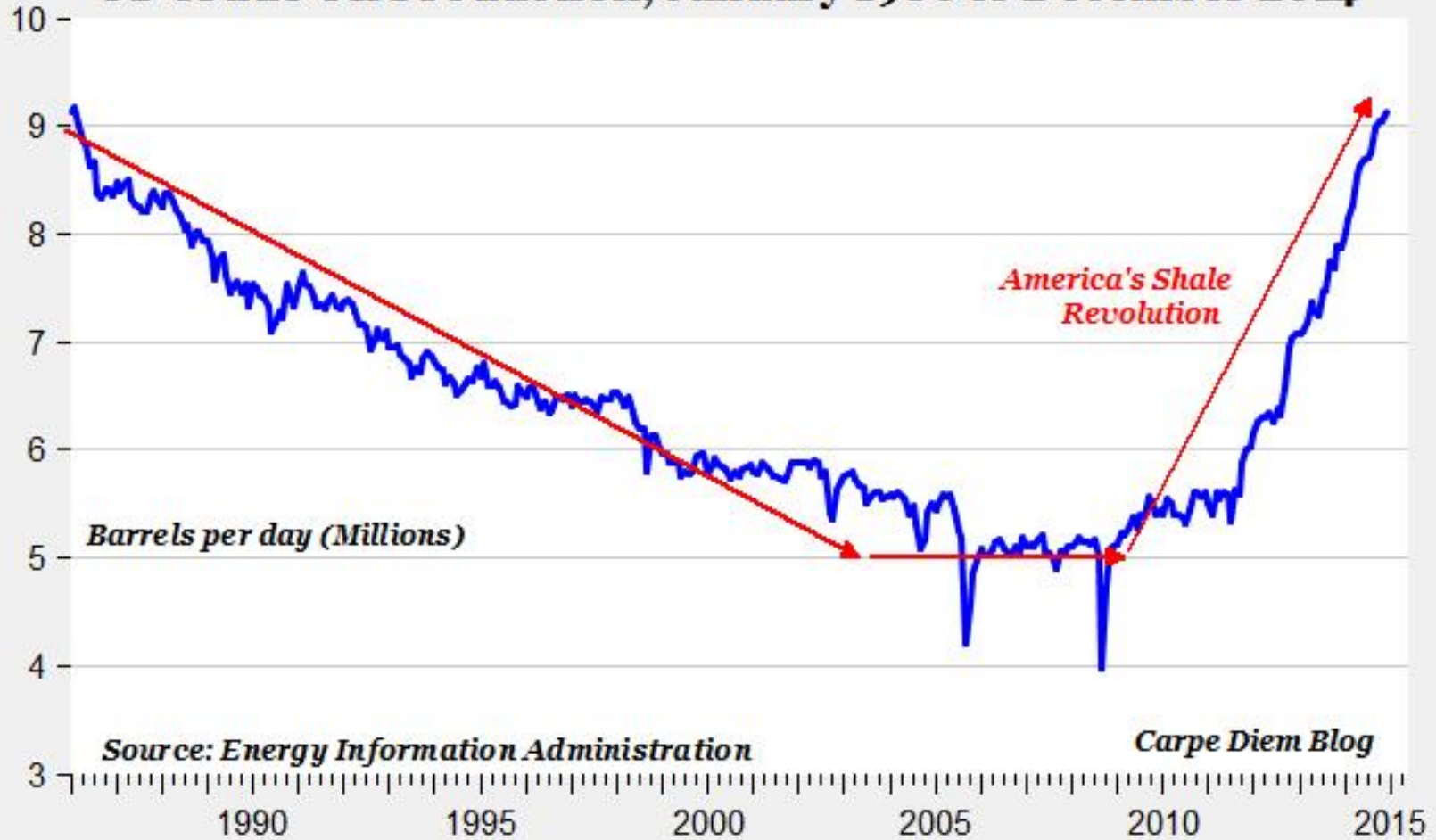


# Major Takeaways

- Crude oil prices are depressed due to the current global oversupply.
- The crude oil oversupply will take between 1 to 3 years to correct, unless a major structural event takes supply out (OPEC, etc.)
- Current crude oil prices are too low and will rise to meet demand. \$100/b is no longer going to be the normal.
- Marginally economic areas across the U.S. will be negatively impacted. Geography and crude quality can tip the sales either way.
- North American LNG exports will be affected in the near-term.

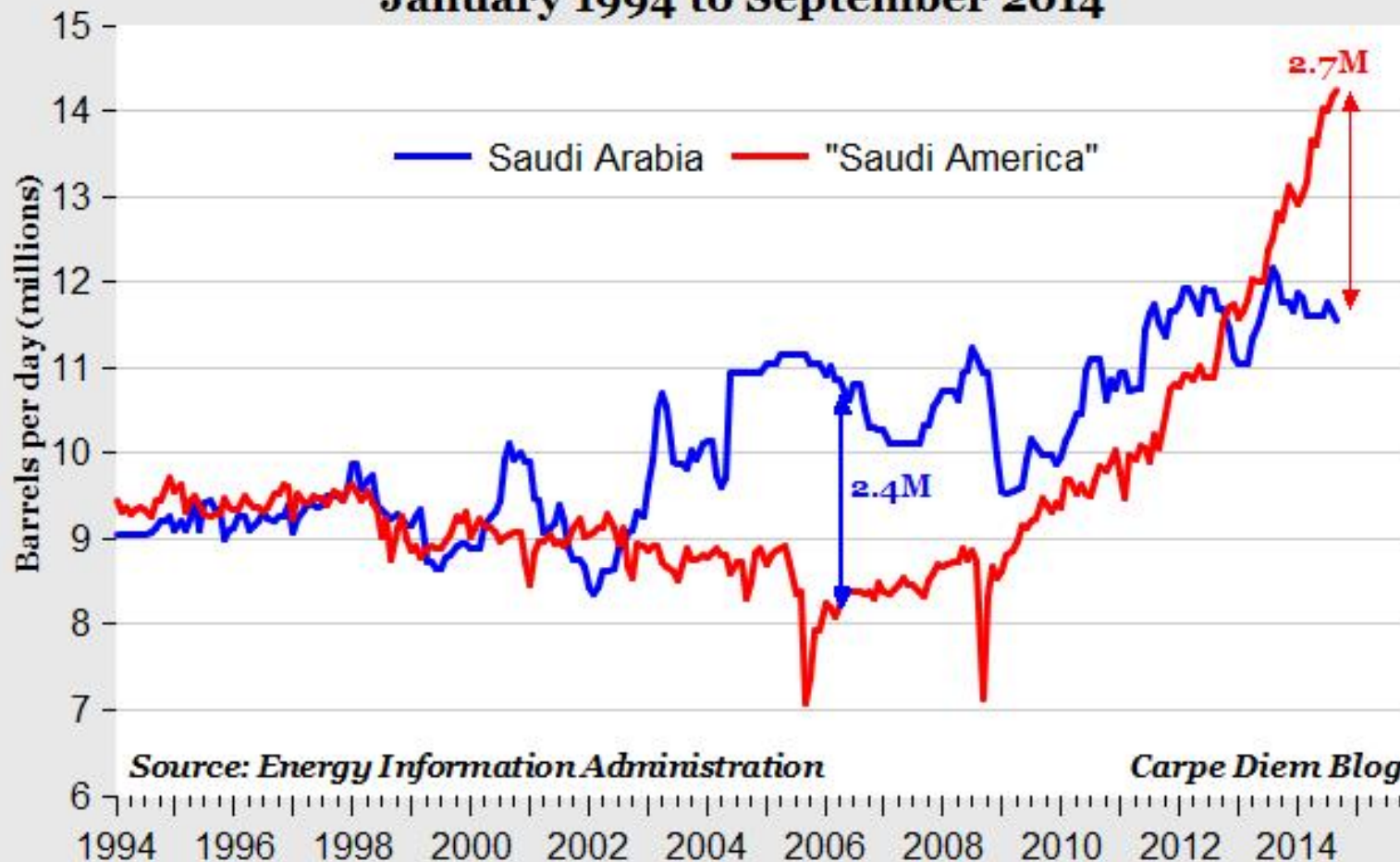


# US Crude Oil Production, January 1986 to December 2014

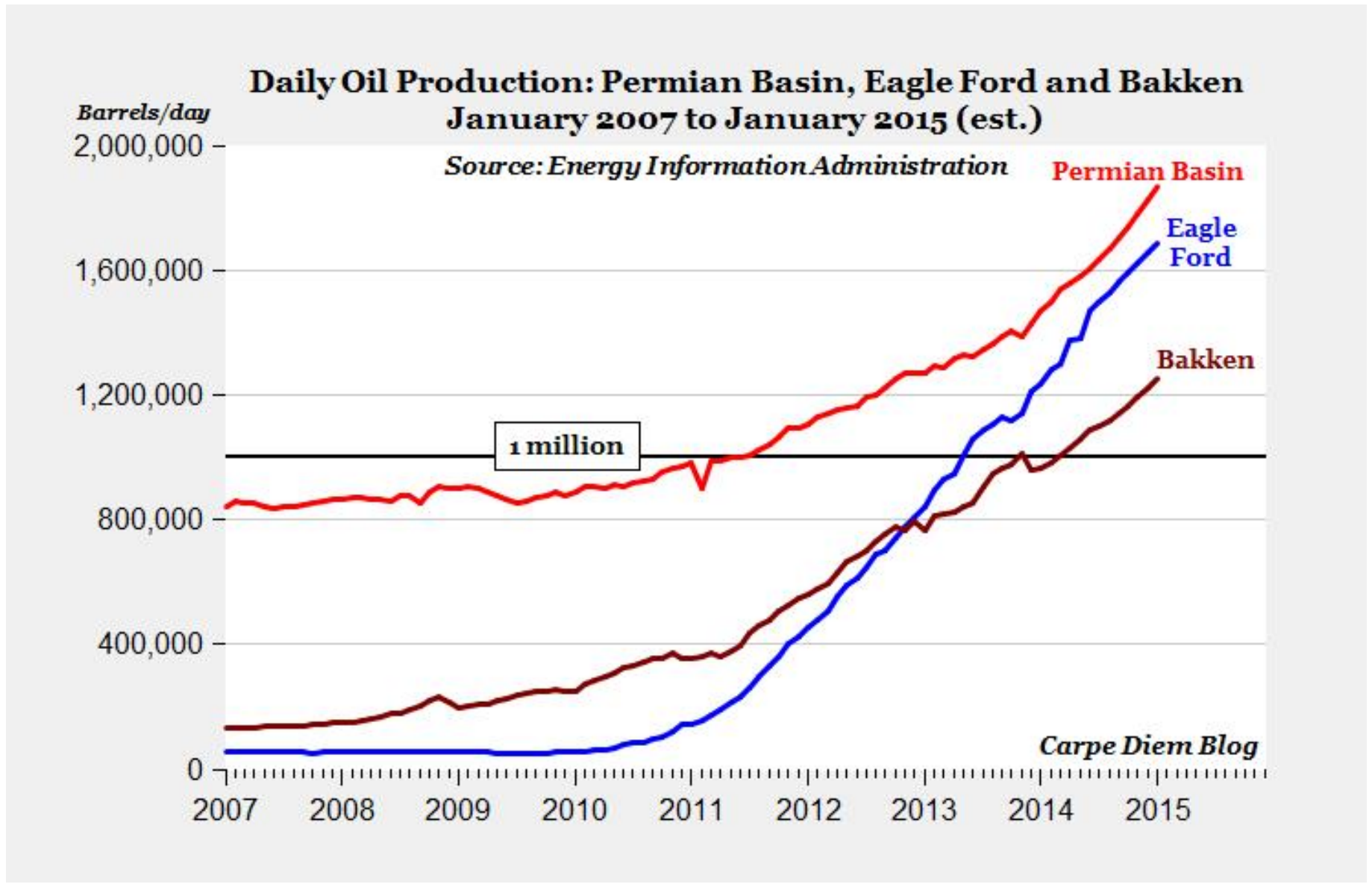


Source: My top ten energy charts of the year for 2014, Mark J. Perry, American Enterprise Institute, January 5, 2015

## Total Petroleum Production: Saudi Arabia vs. US January 1994 to September 2014

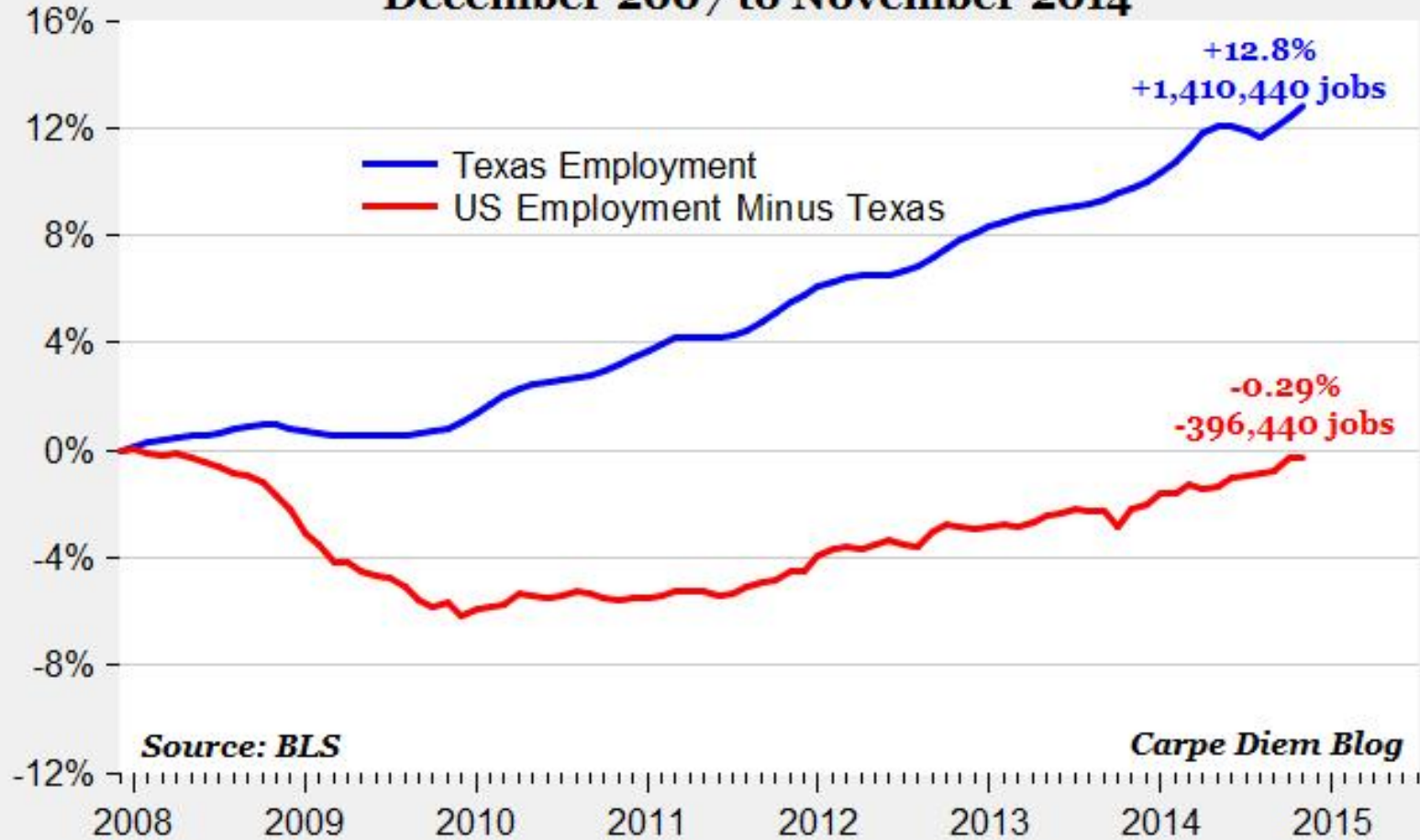


Source: My top ten energy charts of the year for 2014, Mark J. Perry, American Enterprise Institute, January 5, 2015



Source: My top ten energy charts of the year for 2014, Mark J. Perry, American Enterprise Institute, January 5, 2015

## Percent Change in Employment: Texas vs. US Minus Texas December 2007 to November 2014



Source: BLS

Carpe Diem Blog

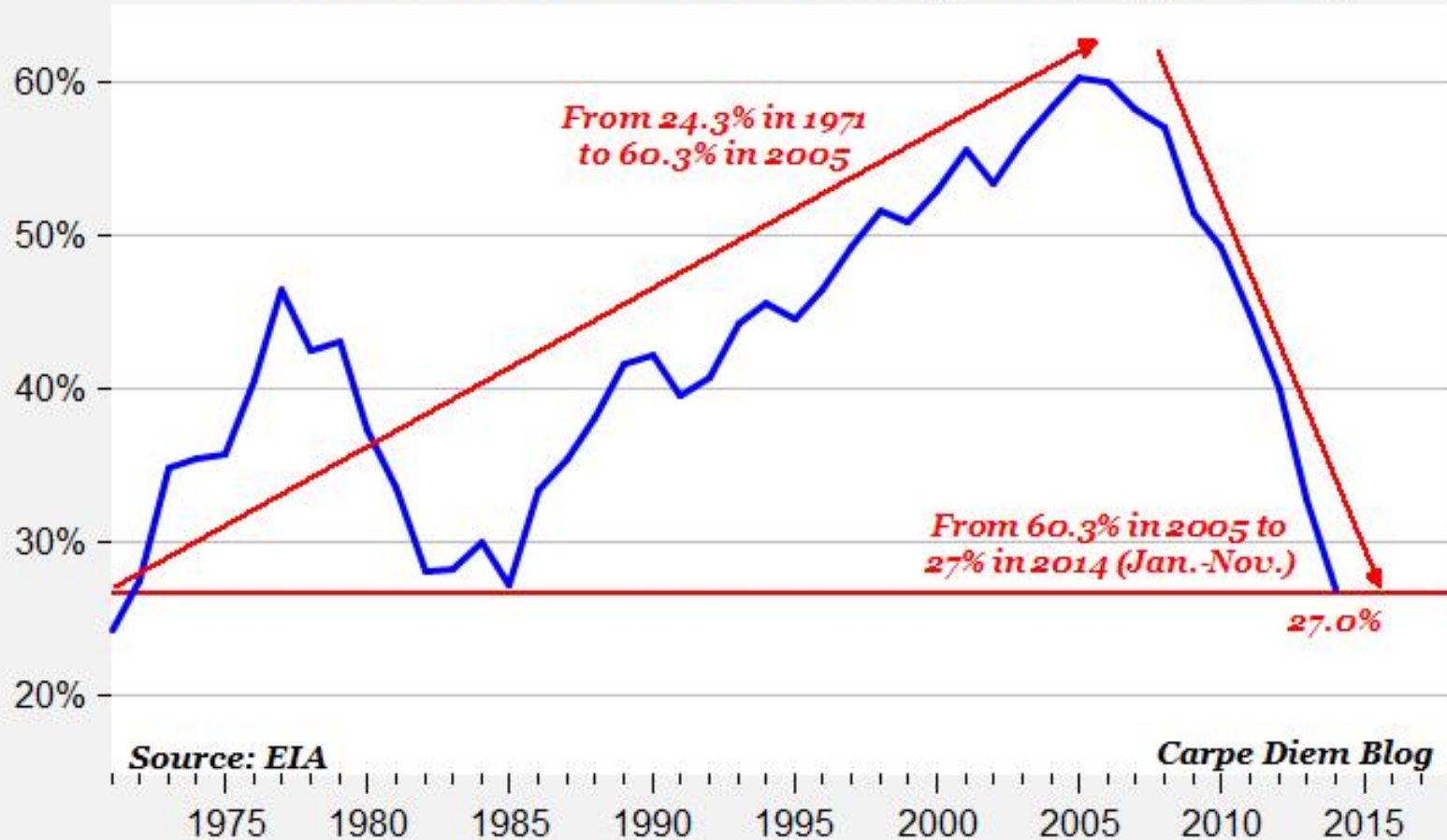


Source: My top ten energy charts of the year for 2014, Mark J. Perry, American Enterprise Institute, January 5, 2015

Mercator Energy



## America's Net Petroleum Imports, 1971-2014



Source: My top ten energy charts of the year for 2014, Mark J. Perry, American Enterprise Institute, January 5, 2015

## Oil at \$65 Until Mid-2015: Kuwait Official













“The reason, according to Iranian Oil Minister, Bijan Namdar Zanganeh, ***was to keep prices low enough and long enough to threaten the U.S. shale oil industry and restore OPEC’s market share in America.*** Shale extraction requires expensive methods such as fracking and horizontal drilling, and many observers say it isn’t profitable if the price of oil drops below \$65 per barrel.”



Source: Real Money, The Street Ratings, By: Oilprice.com, December 11, 2014

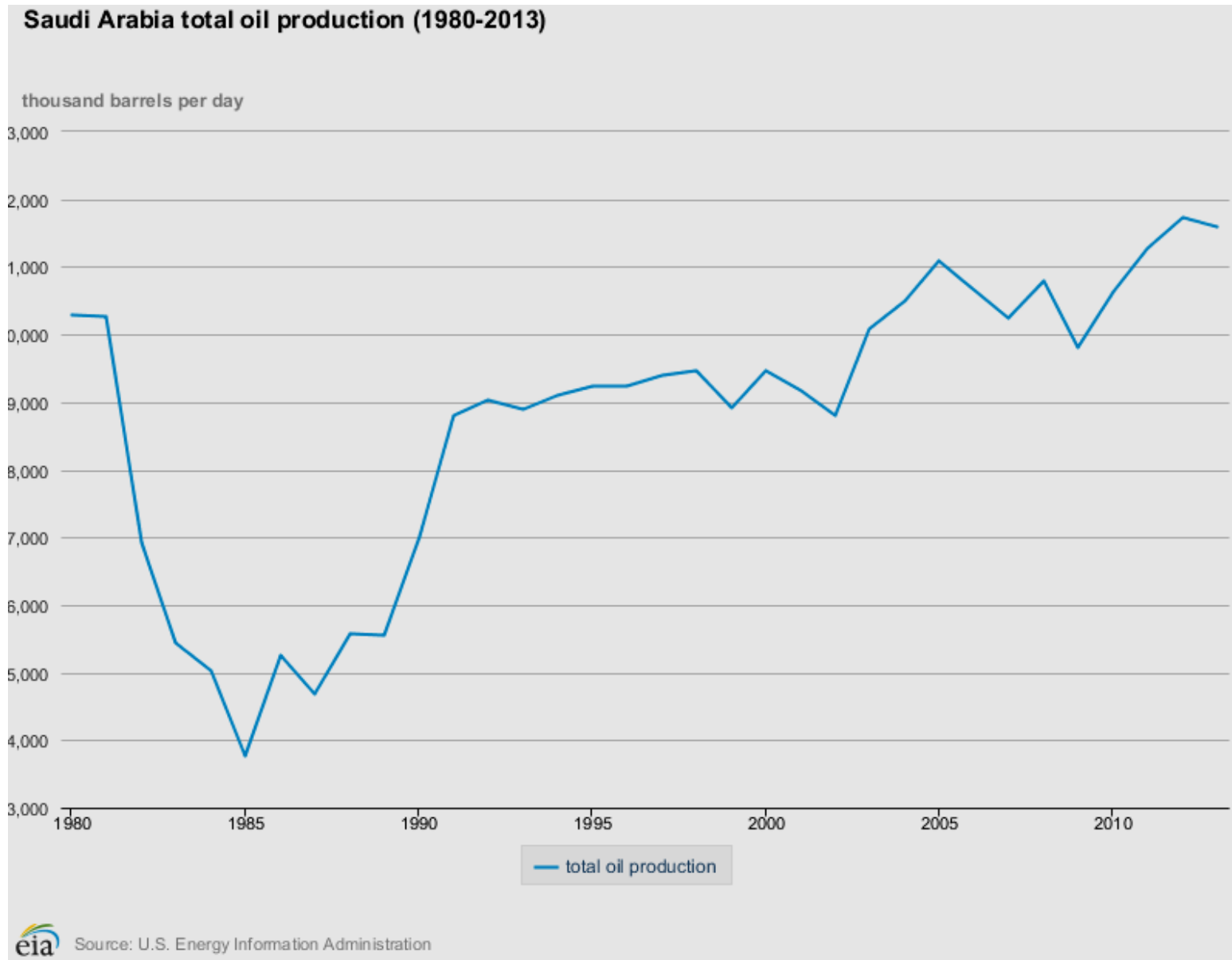
**M**ercator Energy

# OPEC Member States

Country		Region	Joined OPEC <sup>[1]</sup>	Population (July 2008) <sup>[2]</sup>	Area (km <sup>2</sup> ) <sup>[3]</sup>
<a href="#">Algeria</a>		Africa	1969	33,779,668	2,381,740
<a href="#">Angola</a>		Africa	2007	12,531,357	1,246,700
<a href="#">Ecuador</a>		South America	2007 <sup>[A 1]</sup>	13,927,650	283,560
<a href="#">Iran</a>		Middle East	1960 <sup>[A 2]</sup>	75,875,224	1,648,000
<a href="#">Iraq</a>		Middle East	1960 <sup>[A 2]</sup>	28,221,180	437,072
<a href="#">Kuwait</a>		Middle East	1960 <sup>[A 2]</sup>	2,596,799	17,820
<a href="#">Libya</a>		Africa	1962	6,173,579	1,759,540
<a href="#">Nigeria</a>		Africa	1971	146,255,300	923,768
<a href="#">Qatar</a>		Middle East	1961	824,789	11,437
<a href="#">Saudi Arabia</a>		Middle East	1960 <sup>[A 2]</sup>	28,146,656	2,149,690
<a href="#">United Arab Emirates</a>		Middle East	1967	4,621,399	83,600
<a href="#">Venezuela</a>		South America	1960 <sup>[A 2]</sup>	26,414,816	912,050
<b>Total</b>				<b>369,368,429</b>	<b>11,854,977 km<sup>2</sup></b>



# It's About Geopolitical Power & Market Share for the Saudis



# A Game of Chicken?

Nation	Oil price per barrel required to break even or balance budget
<b>US producers</b>	<b>\$38-\$77</b>
Qatar	\$58
Kuwait	\$59
UAE	\$90
<b>Saudi Arabia</b>	<b>\$92</b>
Angola	\$94
<b>Russia</b>	<b>\$101</b>
Iraq	\$116
Venezuela	\$117
Algeria	\$119
Ecuador	\$122
Nigeria	\$124
<b>Iran</b>	<b>\$136</b>

According to data compiled by Bloomberg, *“prices have dropped below the level needed by at least 9 OPEC member states to balance their budgets.”*

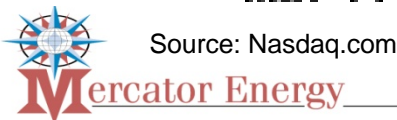
Source: Reuters, *The Saudi Arabian Oil Conspiracy and What it Might Mean for Your Portfolio*, The Motley Fool, Adam Galas, January 18, 2015

*Survival of fittest as oil tumbles below \$65*, Bloomberg News, December 1, 2014

# NGK15 - Natural Gas (NYMEX)

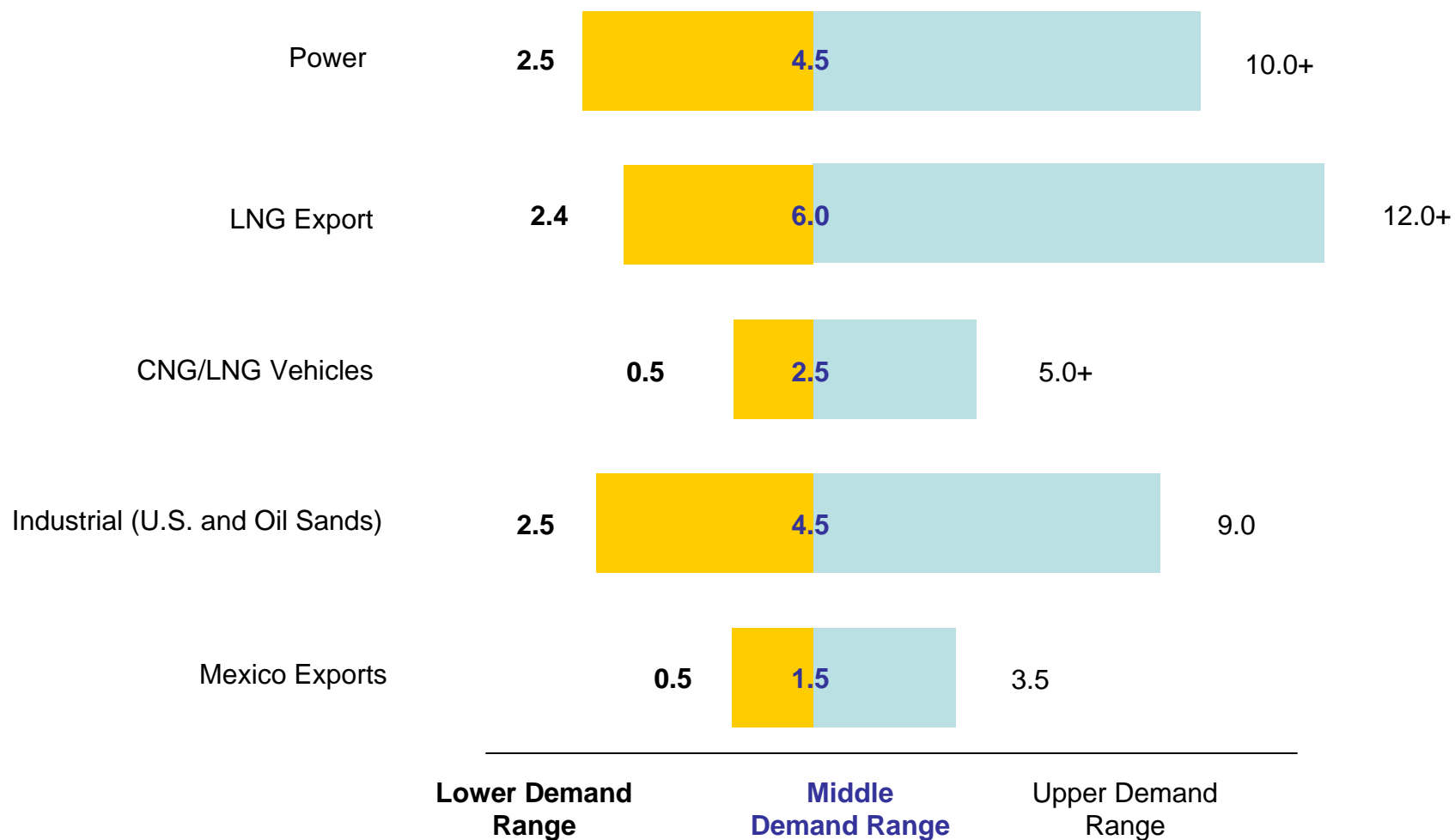


Source: Nasdaq.com, End of day Commodity Futures Price Quotes for Natural Gas (NYMEX)

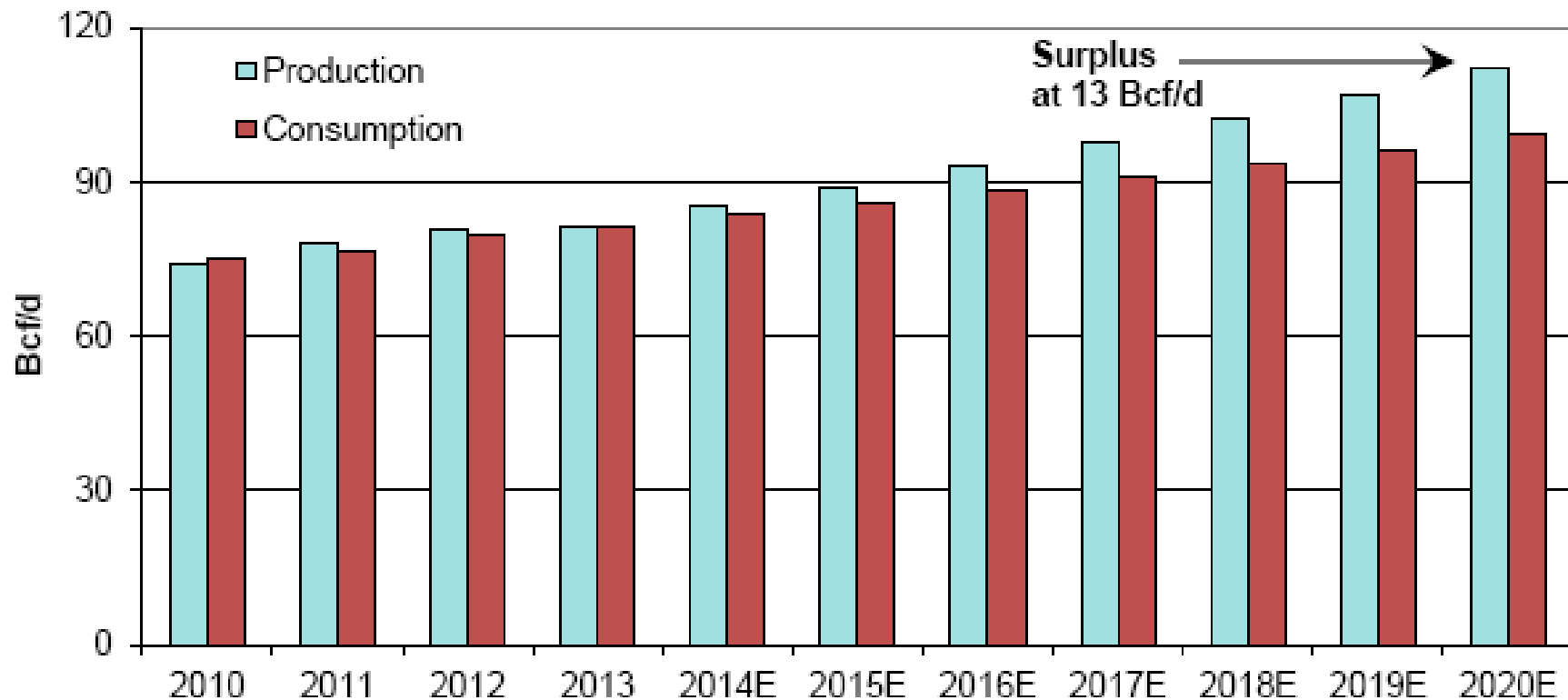


# North American Natural Gas Demand Ranges by Selected Sector

Significant demand growth is possible in the LNG, transportation/HHP and power sectors through 2020 in Bcf per day.



# U.S. and Canada: Natural Gas Production vs. Consumption



Source: BP Statistical Review, Raymond James research

# World LNG Estimated October 2014 Landed Prices



Source: Waterborne Energy, Inc. Data in \$US/MMBtu

# January 2015 World LNG Prices (\$U.S./MMBtu)



Source: Waterborne Energy, Inc. Data in \$US/MMBtu

# Estimated April 2015 World LNG Prices (\$U.S./MMBtu)



Source: Waterborne Energy, Inc. Data in \$US/MMBtu

Mercator Energy



# Is the U.S. LNG Price Arbitrage/Advantage Over?

## The Japanese Crude Cocktail Story

### The Oil Derivative LNG Contract

- LNG prices in Pacific Basin (ie – Japan, South Korea, China) are closely tied to crude oil prices
- On a Btu equivalent
  - Crude oil at \$100 per barrel translates to a JCC price of \$14.85 for LNG delivered to Asia (Japan, South Korea, China) (Rule of Thumb LNG Asia - 14.85% of Brent Crude)
- The oil price decline has eliminated the U.S. LNG export advantage

# Is the U.S. LNG Price Arbitrage/Advantage Over?

## NO!

- U.S. LNG prices delivered to Asia can compete at \$60 oil = \$8.91 per MMBtu equivalent to Tokyo Harbor

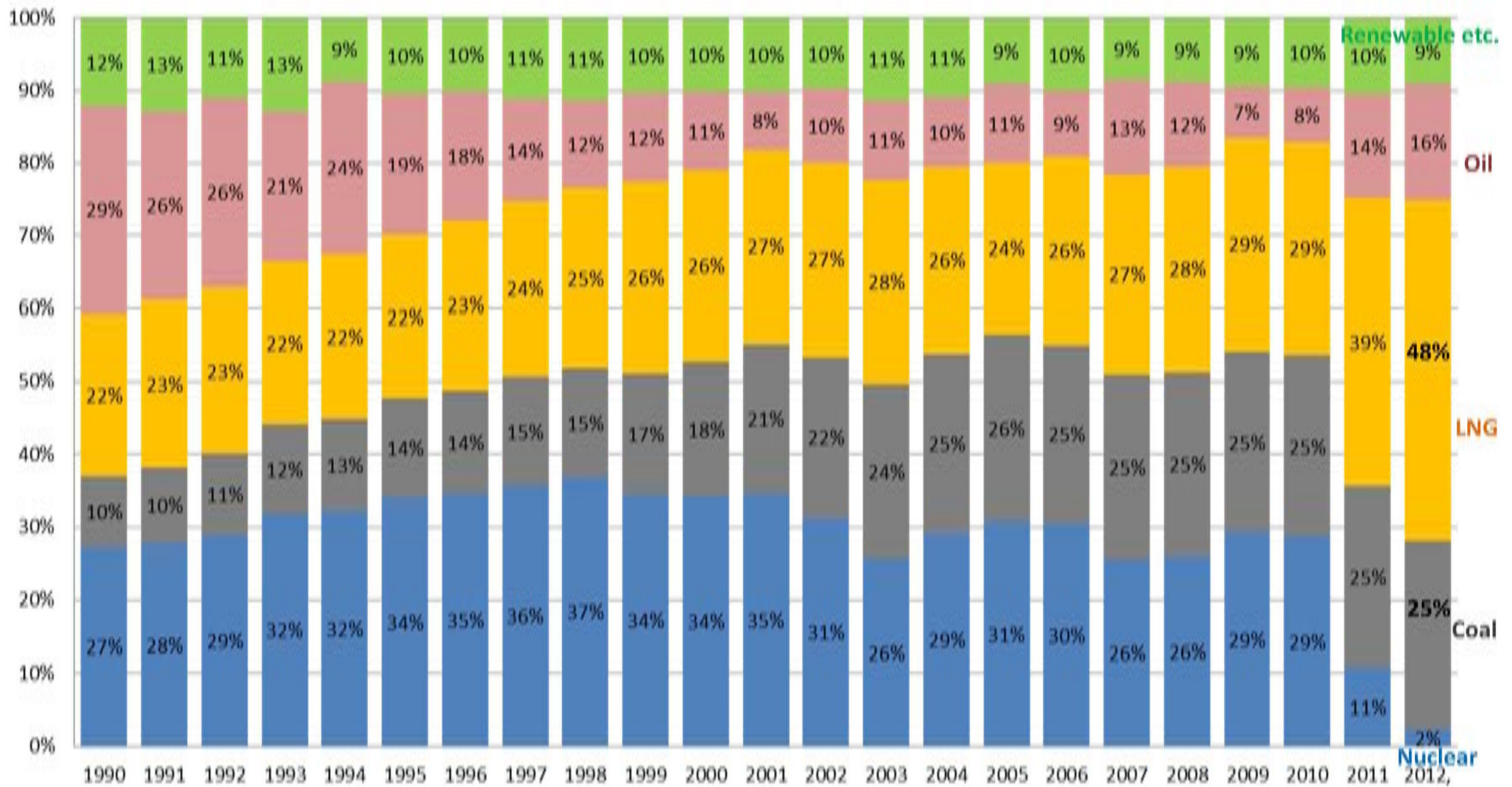
\$3.50/MMBtu	3 year Henry Hub price forecast
\$1.00/MMBtu	ppl cost of transport to LNG facility
\$2.00/MMBtu	liquefaction cost
<hr/>	
\$2.00/MMBtu	shipping cost
\$8.50 MMBtu	Delivered cost to Asia

- U.S. needs \$60-65 crude oil price to breakeven

# Energy Mix in Japan – before and after Fukushima

**LNG mainly compensate for the decline of nuclear power.**

### Electricity Generation by Fuel

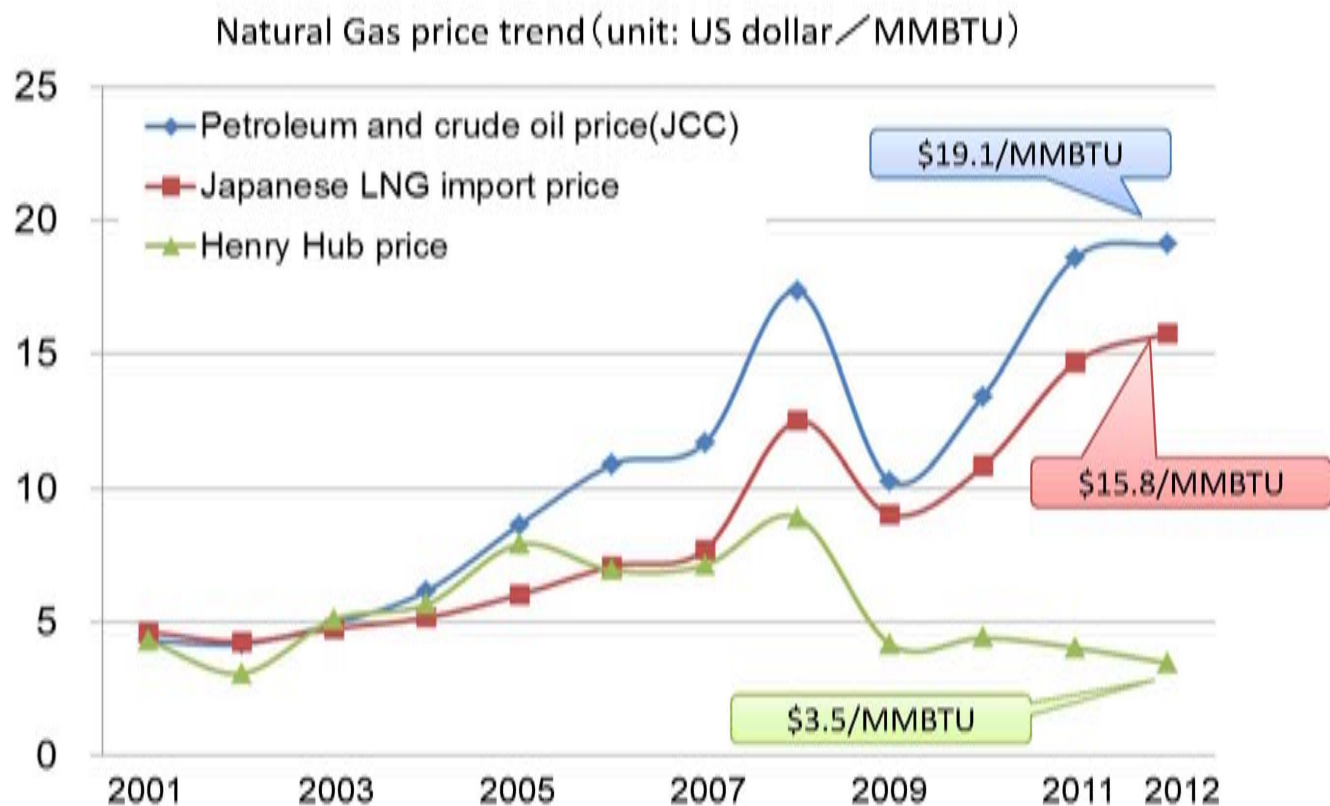


Source: Compiled by METI based on "Outline of Electric Power Development in FY 2010" etc.

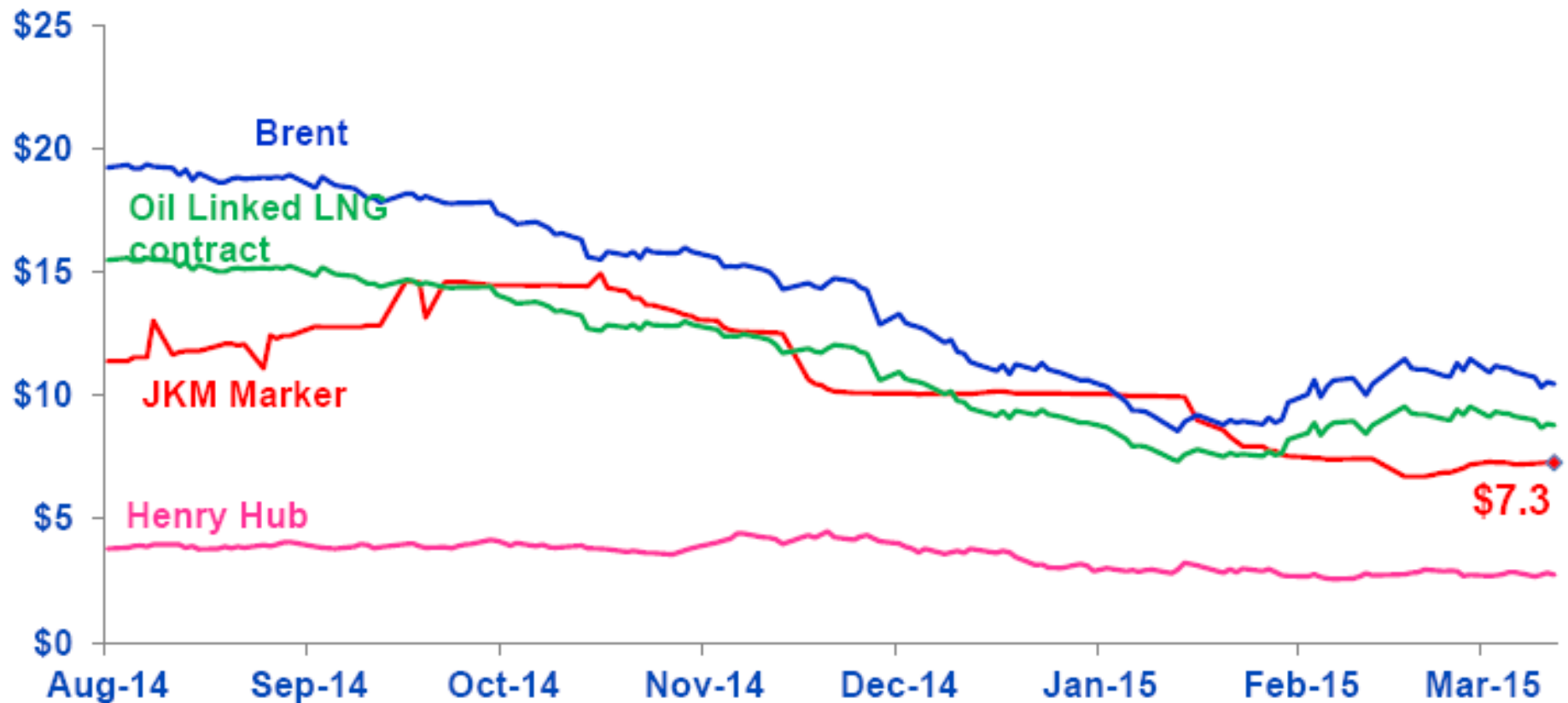
Source: National Bureau of Asian Research

## Japanese LNG cost nearly doubled after Fukushima

- After the Great East Japan Earthquake, Japan's LNG demand has increased by 30% due to the shut down of nuclear power plants. (2010fy 70million tons → 2012fy 90million tons)
- In addition, Japan's LNG import price, linked to crude oil import price, has soared.
- As a result, the overall cost of LNG imports to Japan has increased from 3.5 trillion yen a year to around 6 trillion yen. ※1 trillion yen = \$10.7 billion



# Comparison of Asian Spot vs. Asia Oil Indexed Contract (\$/MMBtu)



# “First Four” LNG Projects Still Moving Forward

- Sabine Pass LNG (Louisiana)
  - Four 4.5 mtpa trains (currently under construction) will be able to liquefy a total of 2.2 Bcf/d
  - Trains 1 & 2 expected to come online in late 2015 or early 2016
  - Trains 3 & 4 expected to come online 2016-17
  - Off-takers: BG Group, GAIL (India), Gas Natural Fenosa and Korea Gas (together have agreed to take 16 mtpa)
- Cameron LNG (Louisiana)
  - Joint venture of Sempra Energy, GDF Suez, Mitsui & Co. and Mitsubishi Corp.
  - Three 4 mtpa trains (currently under construction) will be able to liquefy 1.7 Bcf/d
  - All trains are expected to be fully operational in 2019
  - Off-takers: GDF Suez, Mitsui and Mitsubishi



Source: *Is That All There Is? Will an LNG Surplus and Cheap Oil Cap LNG Exports?* Rusty Brazier, RBN Energy, January 26, 2015

# “First Four” LNG Projects Still Moving Forward

- Freeport LNG (Texas)
  - Two 4.6 mtpa trains (currently under construction) will be able to liquefy 1.4 Bcf/d
  - Trains 1 & 2 expected to be online in 2018
  - FID and construction start up on third train expected soon
  - Off-takers: Osaka Gas, Chubu Electric, BP Energy, Toshiba Corp. and SK E&S LNG have committed to take all 3 trains’ total capacity
- Cove Point (Maryland)
  - One 5.75 mtpa train expected to liquefy up to 770 MMcf/d
  - Expected to be online late 2017
  - Off-takers: Sumitomo Corp. and GAIL (India) have each contracted for 2.3 mtpa of liquefaction capacity



Source: *Is That All There Is? Will an LNG Surplus and Cheap Oil Cap LNG Exports?* Rusty Brazier, RBN Energy, January 26, 2015

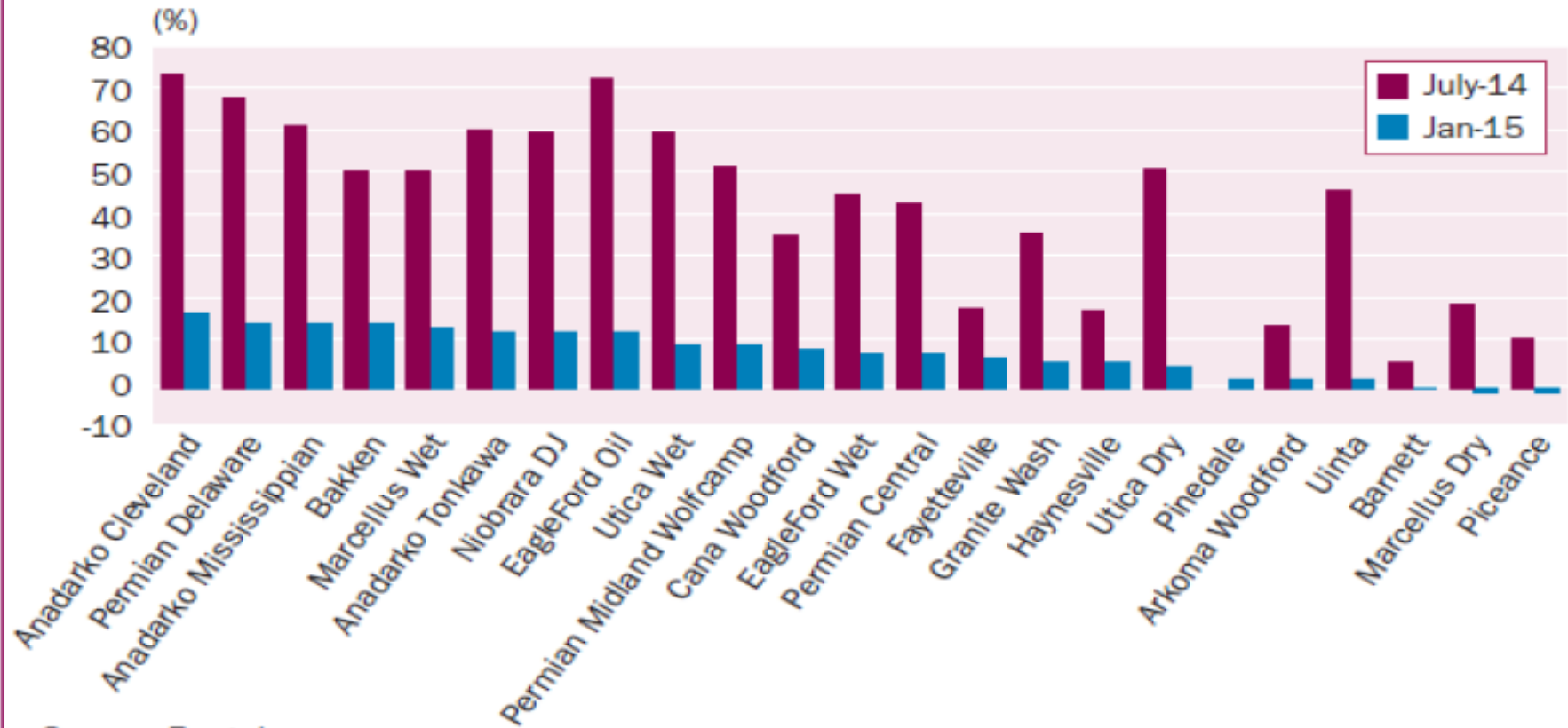


# What Basins are Competitive in This Price Environment?





## Internal Rates of Return per Well by Basin/Play (January 2015 versus July 2014)



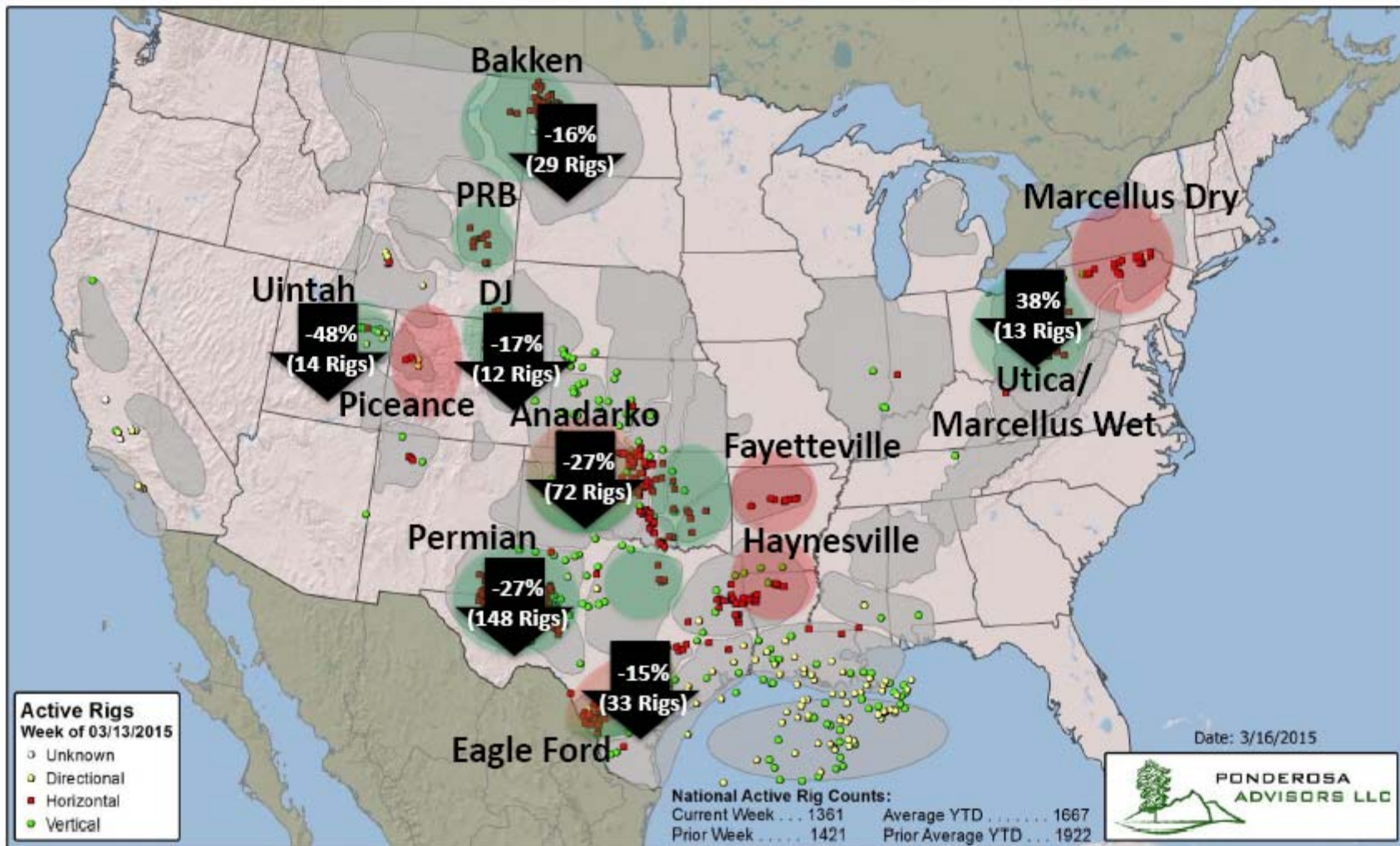
Source: Bentek



Source: *Shale economics challenged as prices plummet*, Arjun Sreekumar, Platts Gas Daily Volume 32 / Issue 7 / Monday, January 12, 2015

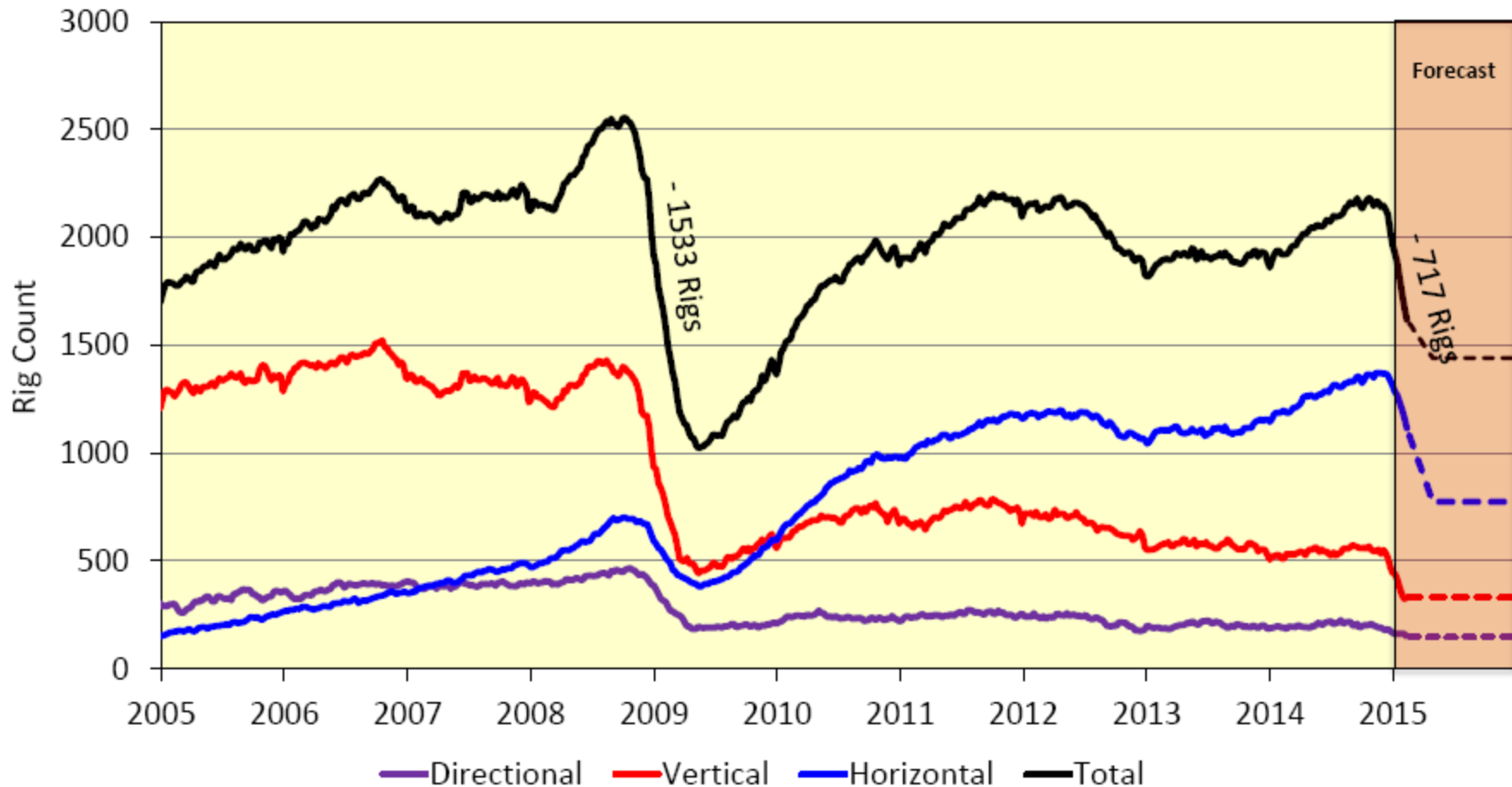


# The Active Rig Count Is Already Down 25% From the Peak & Will Continue To Fall



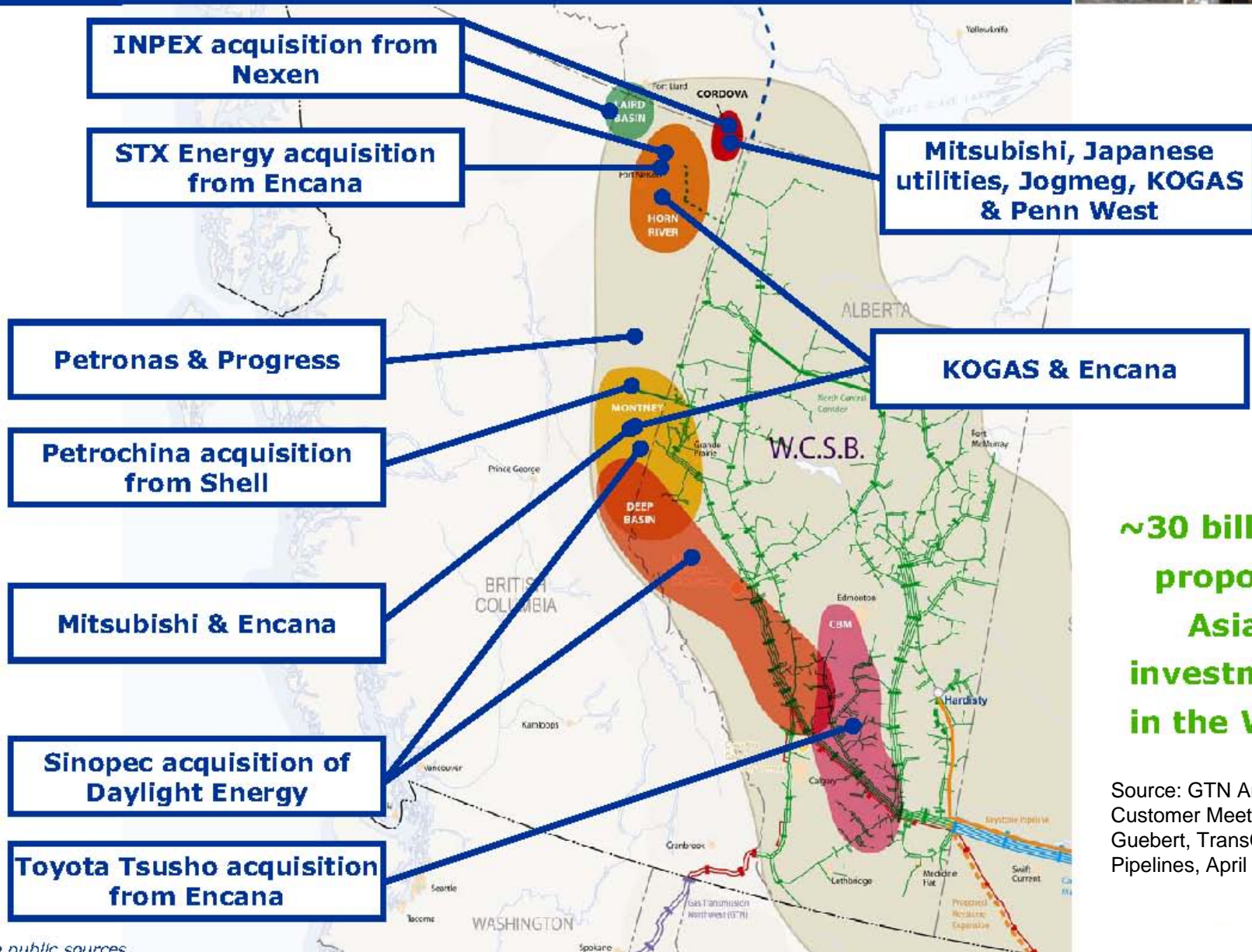
# The U.S. Rig Fleet Has Lost At Least 528 Rigs To-Date...More Rigs Will Come Off

This Rig Drop Is Different Than 08/09 Because Rigs Are More Productive



# Supply Update

## Asian Investments – WCSB Natural Gas

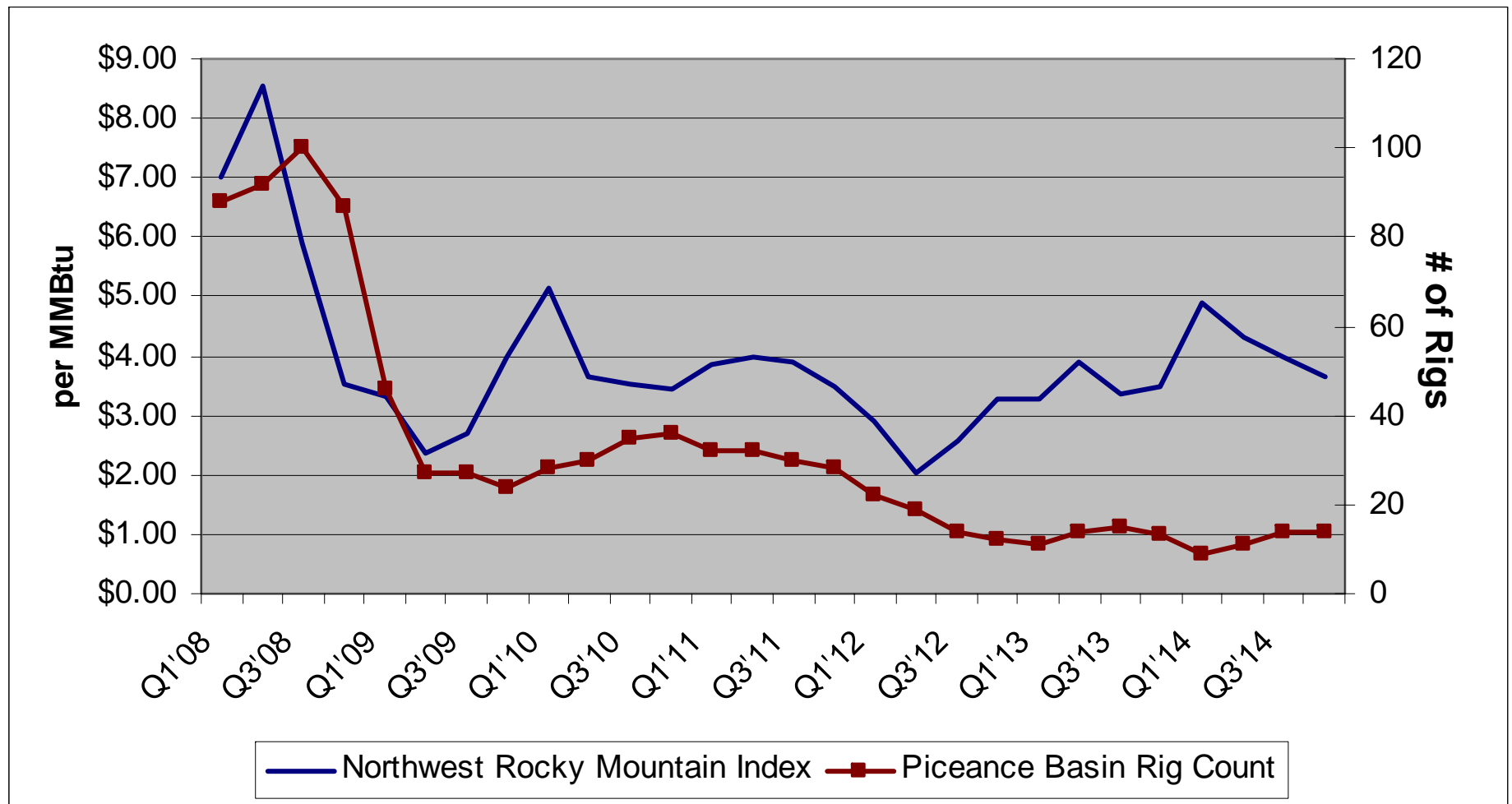


**~30 billion of proposed Asian investments in the WCSB**

Source: GTN Annual Customer Meeting, Roland Guebert, TransCanada Pipelines, April 18, 2013

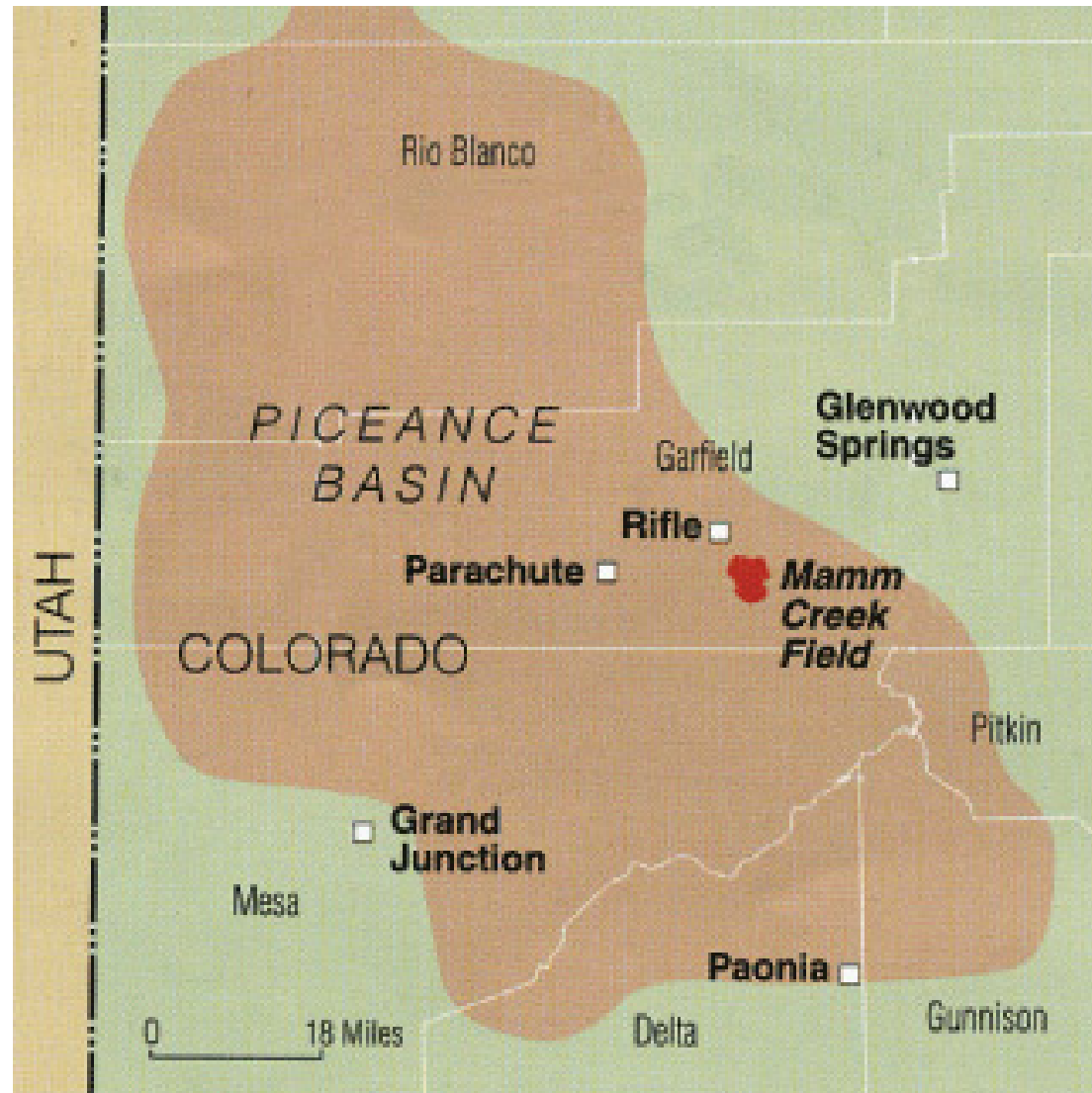


# Decline of Natural Gas Price Index Since 2008 and Piceance Basin Rig Count 2008-Current (By Quarter)



Source: Inside FERC's Gas Marketing Report, A McGraw Hill Publication and Tudor Pickering Holt & CO

# Piceance Basin Map



## Annual Natural Gas Production in Counties That Contain the Piceance Basin

<u>County</u>	<u>2000</u>	<u>2001</u>	<u>2002</u>	<u>2003</u>	<u>2004</u>	<u>2005</u>	<u>2006</u>
Delta	0.001	0.005	0.006	0.002	0.025	0.401	0.065
Garfield	70.305	88.285	116.868	149.824	209.714	270.231	351.613
Gunnison	0.121	0.110	0.040	0.079	0.079	0.007	0.556
Mesa	5.668	5.027	7.695	9.345	7.807	10.755	15.478
Moffat	19.544	17.489	19.178	18.527	19.557	19.5821	19.742
Pitkin	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Rio Blanco	31.240	31.414	35.936	34.159	33.622	37.579	48.159
TOTAL (Bcf)	126.878	142.330	179.723	211.935	270.804	338.495	435.612
TOTAL (MMcf/d)	346.7	389.9	492.4	50.6	739.9	927.4	1193.5
<b>YY % Change</b>	<b>N/A</b>	<b>12.5%</b>	<b>26.3%</b>	<b>17.9%</b>	<b>27.4%</b>	<b>25.3%</b>	<b>28.7%</b>
<u>County</u>	<u>2007</u>	<u>2008</u>	<u>2009</u>	<u>2010</u>	<u>2011</u>	<u>2012</u>	<u>TOTAL</u>
Delta	0.019	0.026	0.010	0.009	0.015	0.061	0.646
Garfield	443.400	565.152	610.868	648.453	676.333	702.767	4903.811
Gunnison	1.183	1.475	1.410	2.078	1.901	1.974	11.012
Mesa	30.651	42.788	38.476	37.992	41.662	47.134	300.477
Moffat	16.150	20.169	17.082	19.345	18.252	17.011	241.567
Pitkin	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Rio Blanco	48.119	54.468	76.041	99.841	106.274	90.586	727.438
TOTAL (Bcf)	539.522	684.079	743.887	807.718	844.436	859.534	6184.952
TOTAL (MMcf/d)	1478.1	1869.1	2038.0	2212.9	2313.5	2348.5	N/A
<b>YY % Change</b>	<b>23.9%</b>	<b>26.4%</b>	<b>9.0%</b>	<b>8.6%</b>	<b>4.5%</b>	<b>1.5%</b>	<b>N/A</b>

Note: These figures are largely driven by Piceance production, but may contain some production from other formations.

Source: Colorado Oil & Gas Conservation Commission data, NGI's Shale Daily calculations

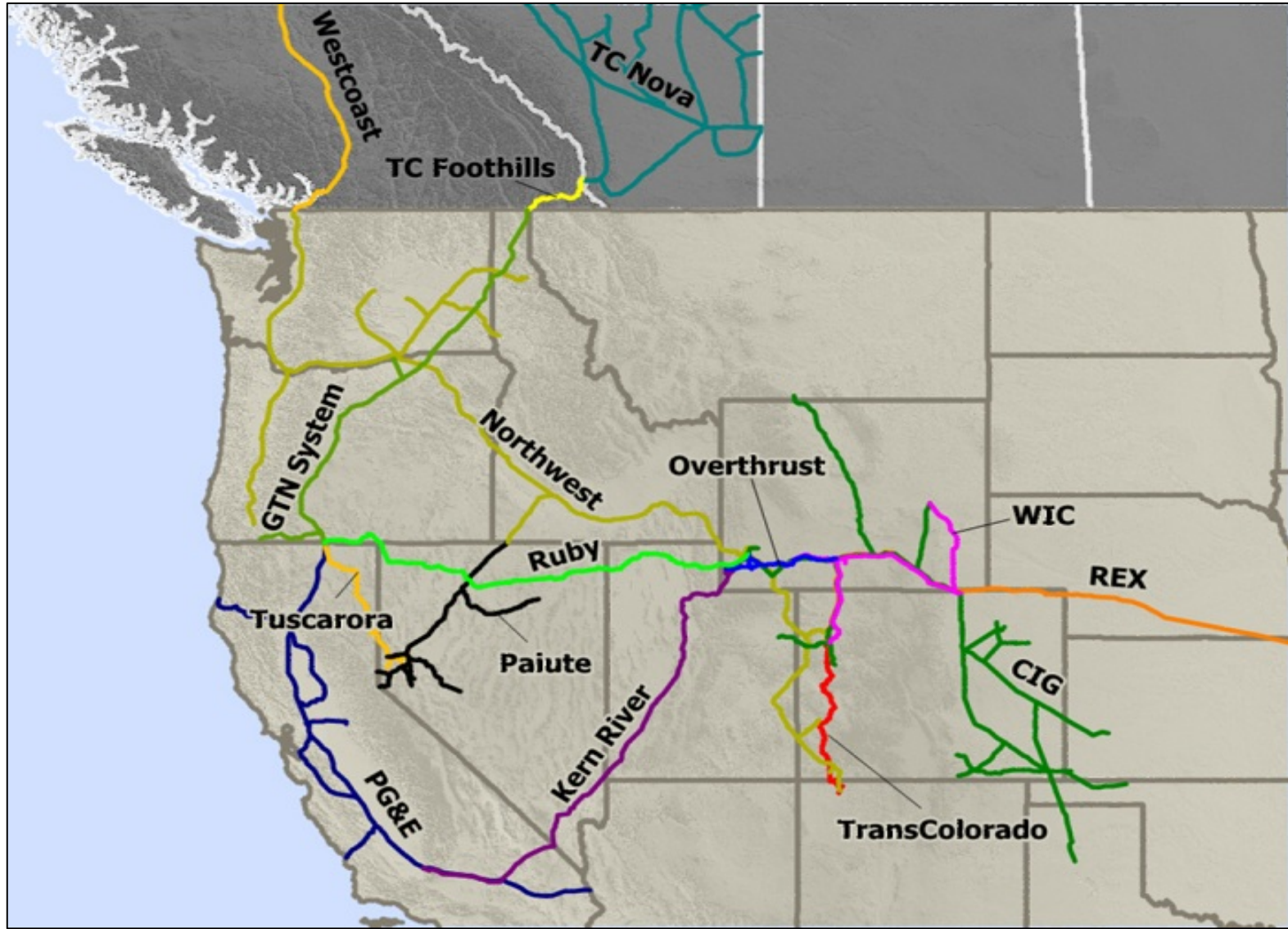


# The LNG Delivery Chain

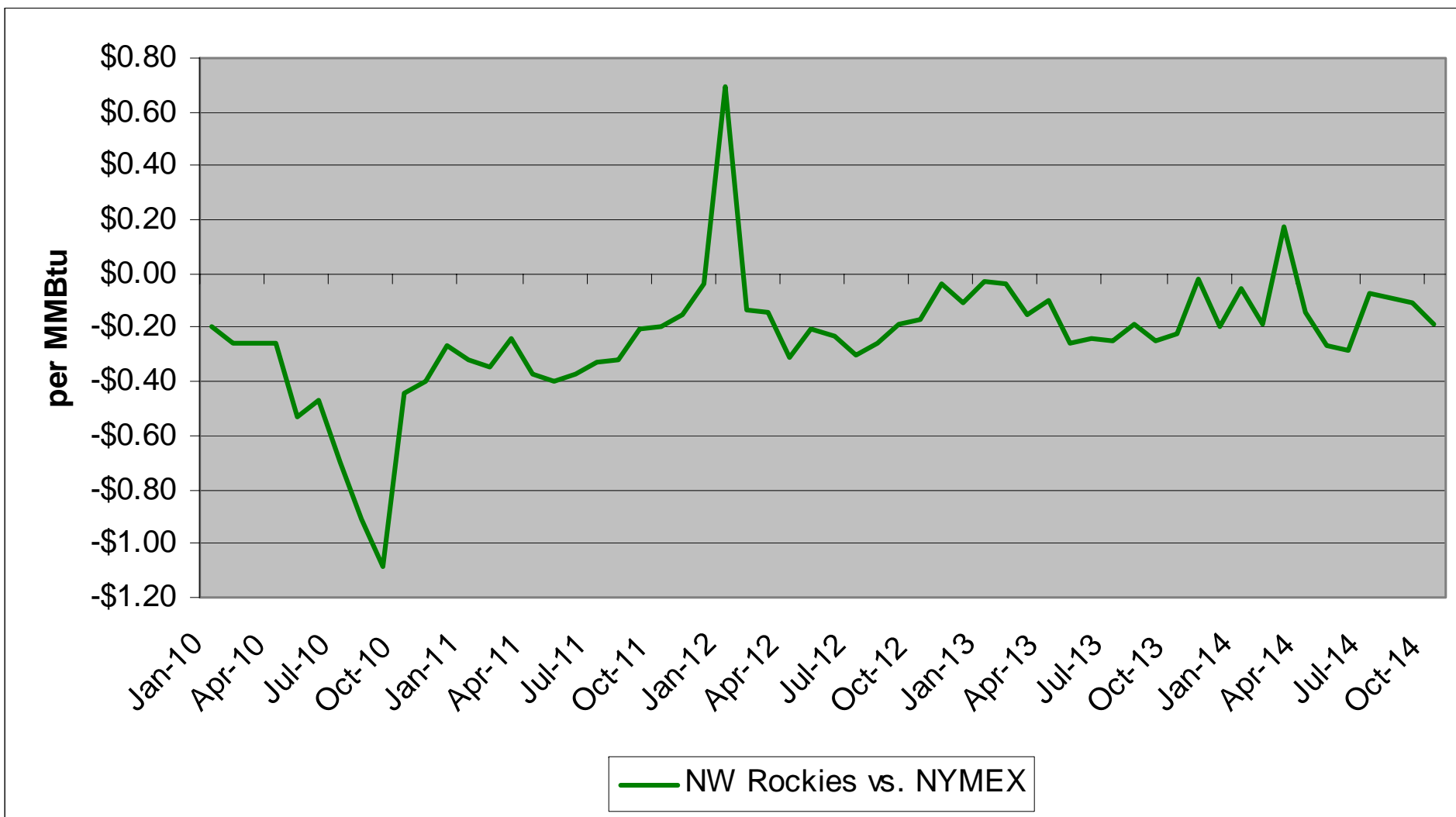


Source: King & Spalding Energy Newsletter, August 2014

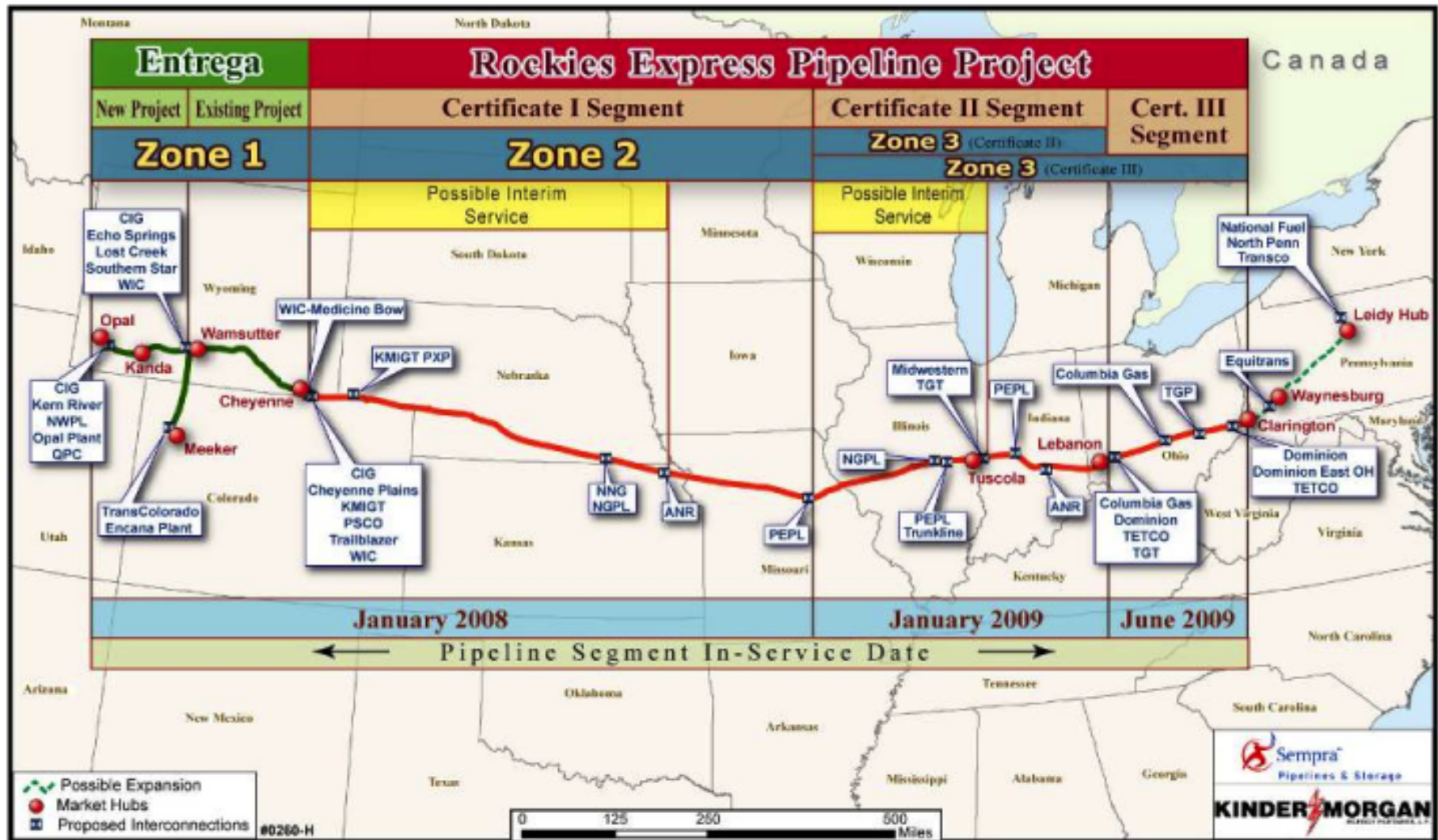
# Rockies Pipeline Infrastructure



# Basis Differential Between Northwest-Rockies and NYMEX 2010-Current



# Rockies Express Pipeline

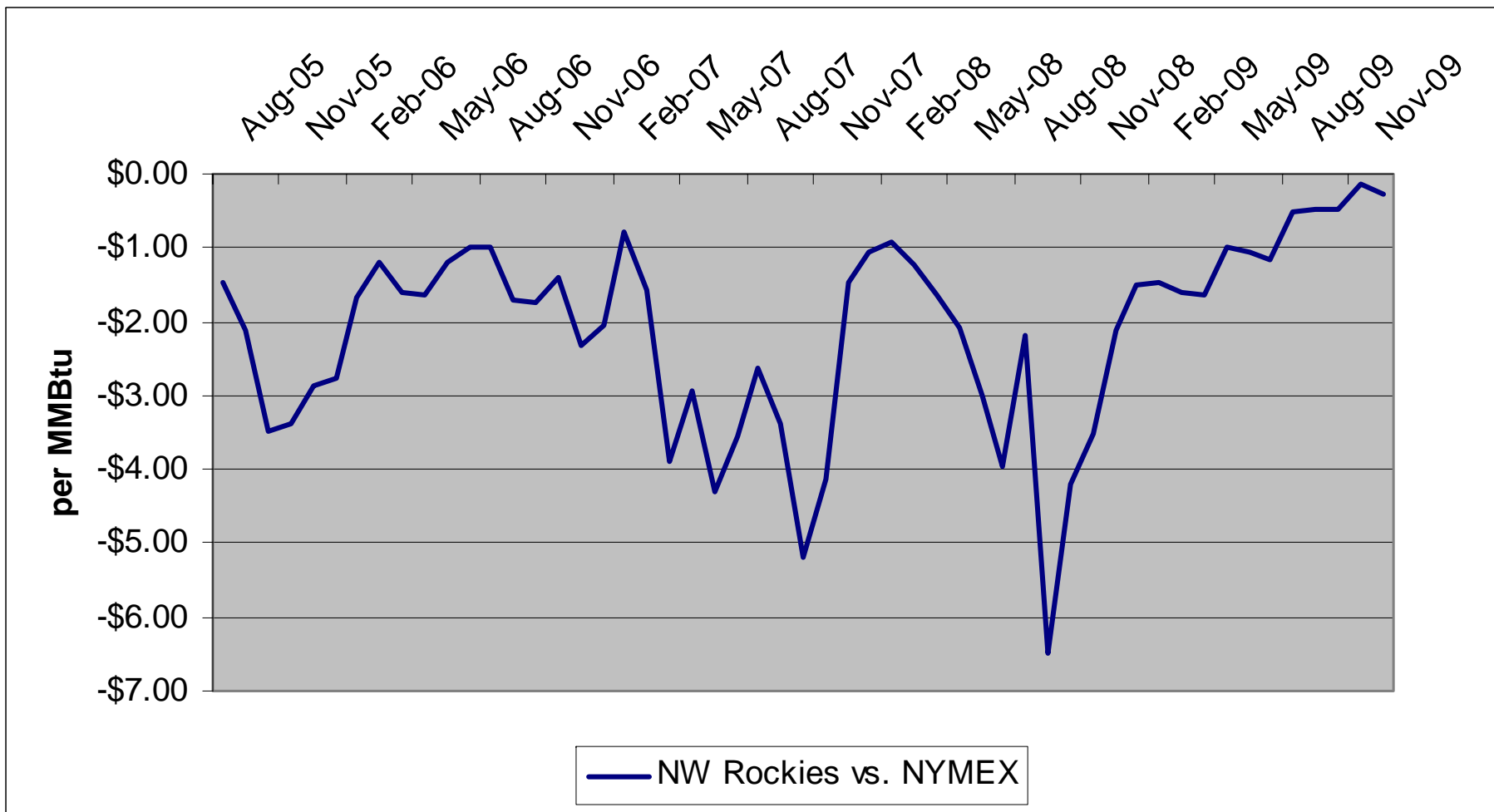


# REX (Entrega) Anchor Shippers

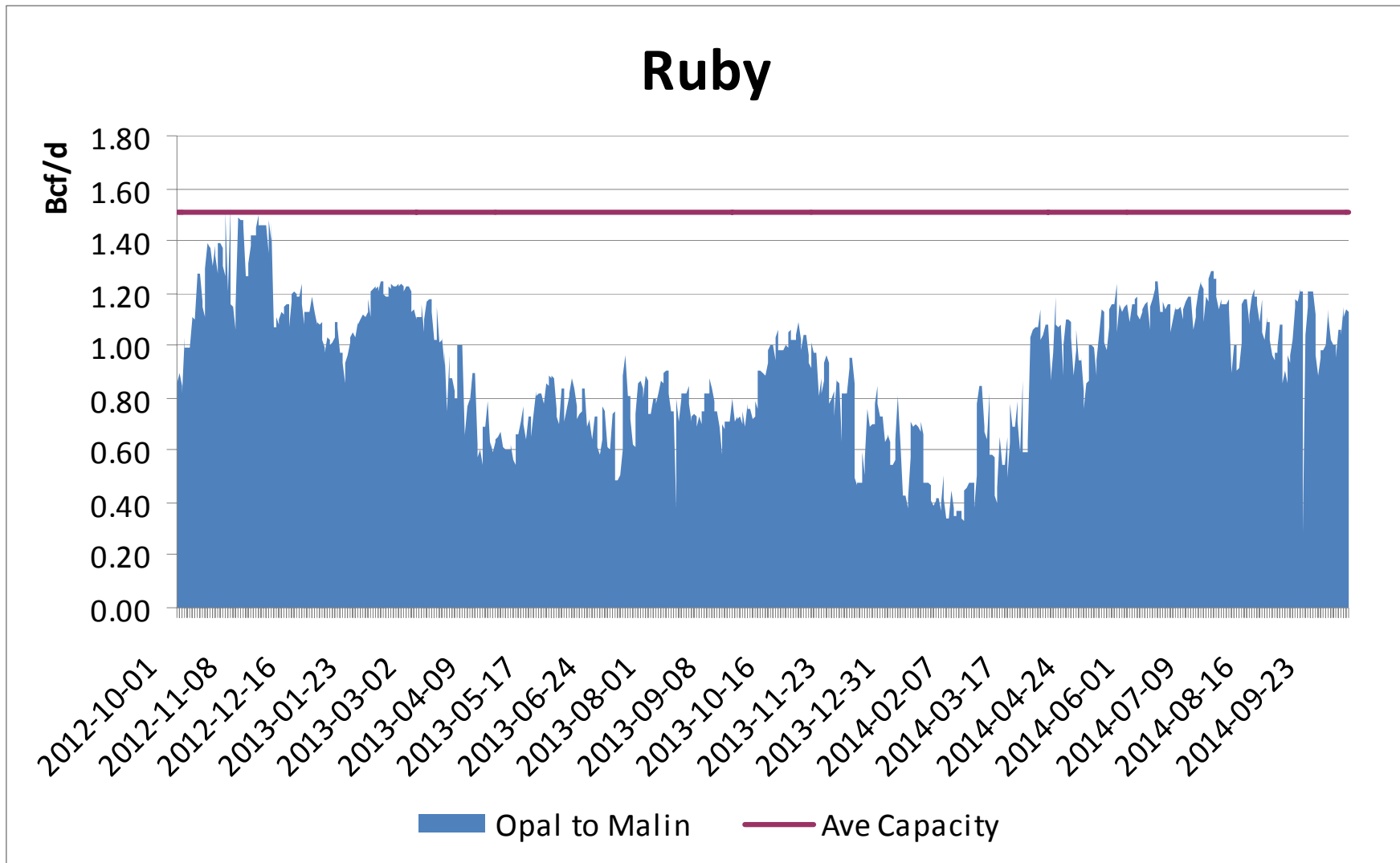
<u>Shipper</u>	<u>Capacity</u>	<u>Contract Expiration</u>
Berry Petroleum Company	10,000	11/11/2019
Bill Barrett Corporation	25,000	11/11/2019
BP Energy Company	200,000	11/11/2019
ConocoPhillips Company	250,000	11/11/2019
Encana Marketing (USA) Inc.	500,000	2/13/2022
Marathon Oil Company	12,000	11/11/2019
Occidental Energy Marketing, Inc.	120,000	12/8/2019
Sempra Rockies Marketing LLC	100,000	11/11/2019
WPX Energy Marketing, LLC	165,000	12/31/2015
Wyoming Interstate Company, L.L.C.	80,000	12/8/2019
	1,462,000	



# Basis Differential Between Northwest-Rockies and NYMEX 2005-2009



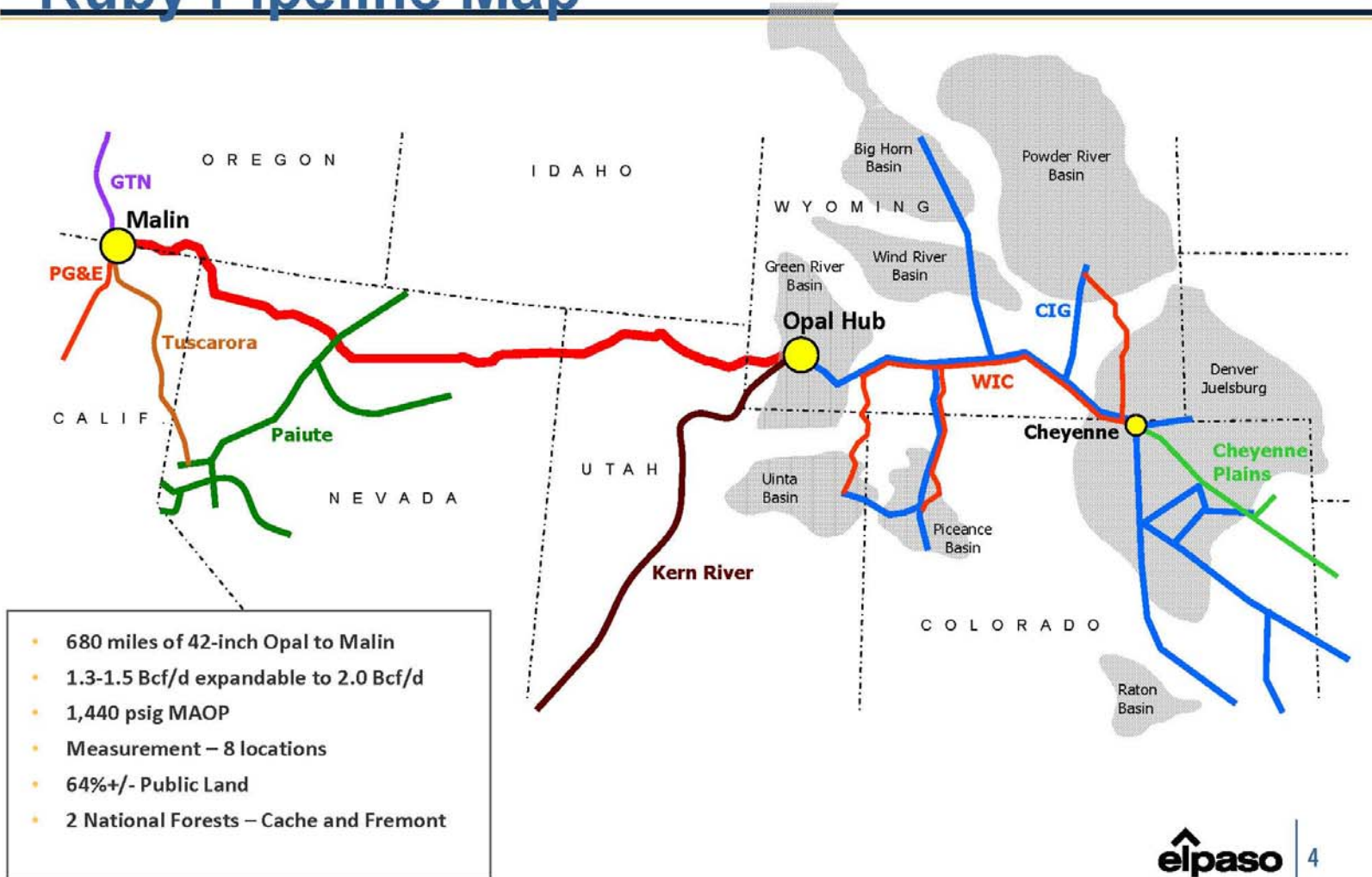
# Ruby Capacity



Source: Bentek Energy

# Ruby Pipeline Map

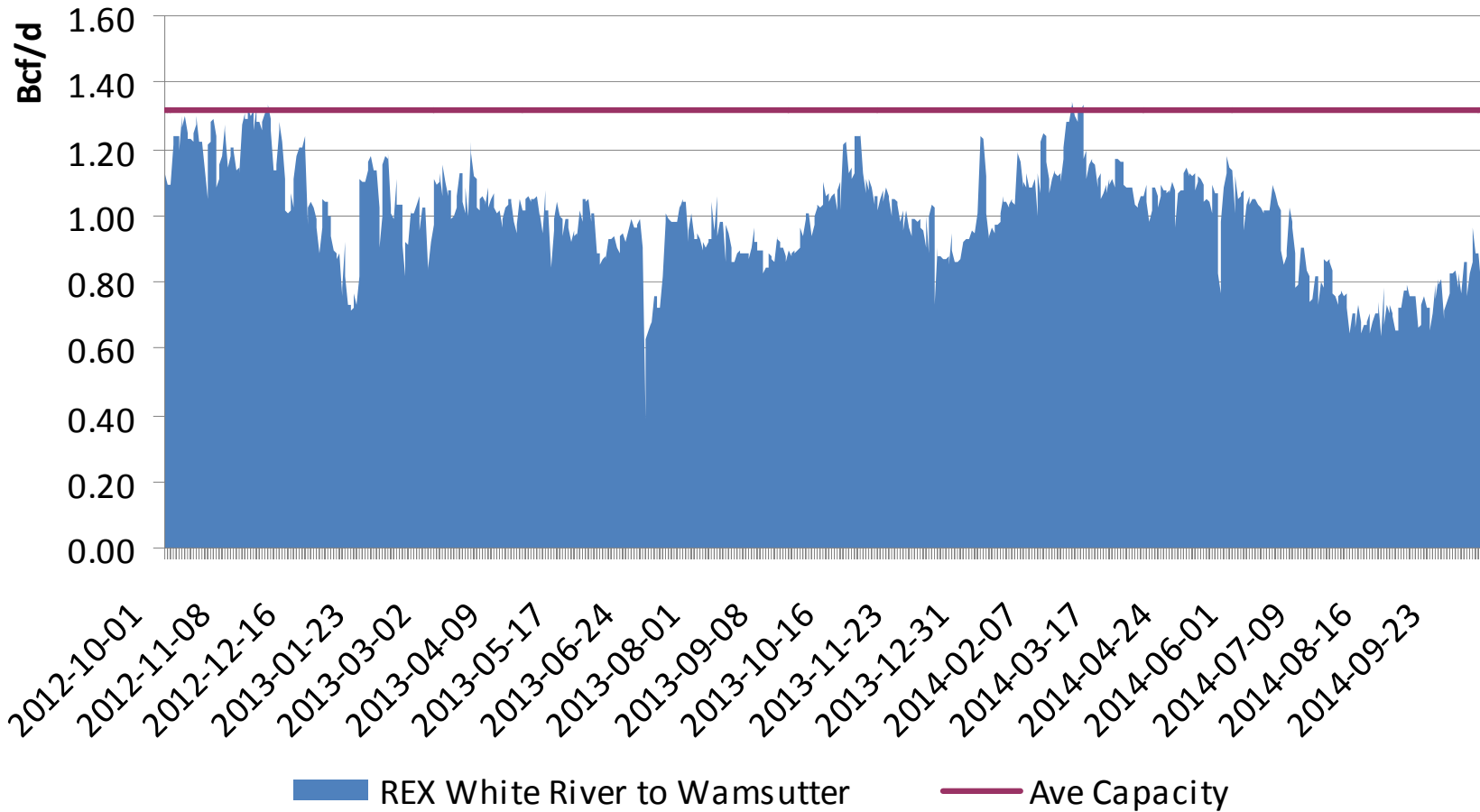
## Ruby Pipeline Map





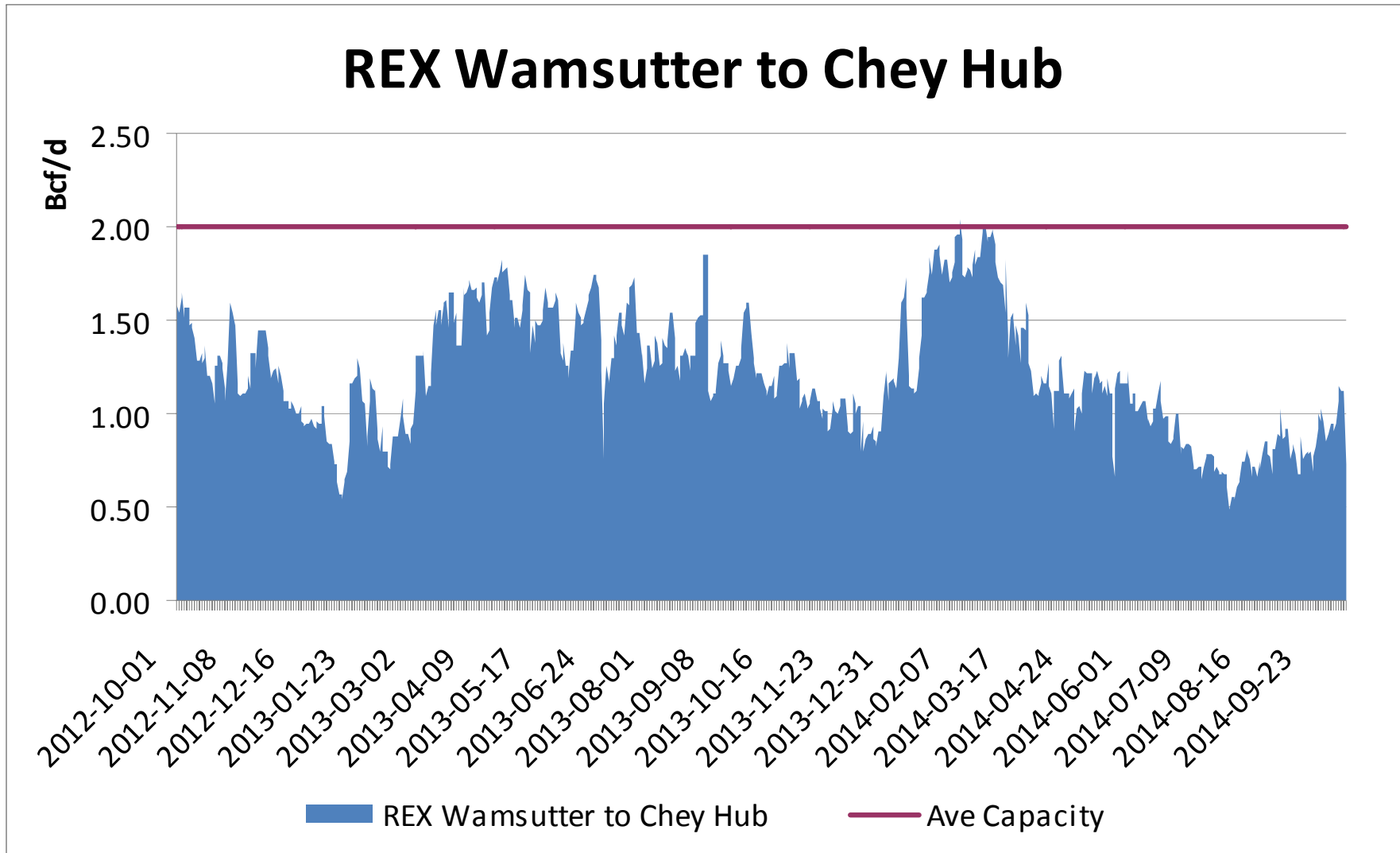
# REX Capacity

## REX White River to Wamsutter



Source: Bentek Energy

# REX Capacity



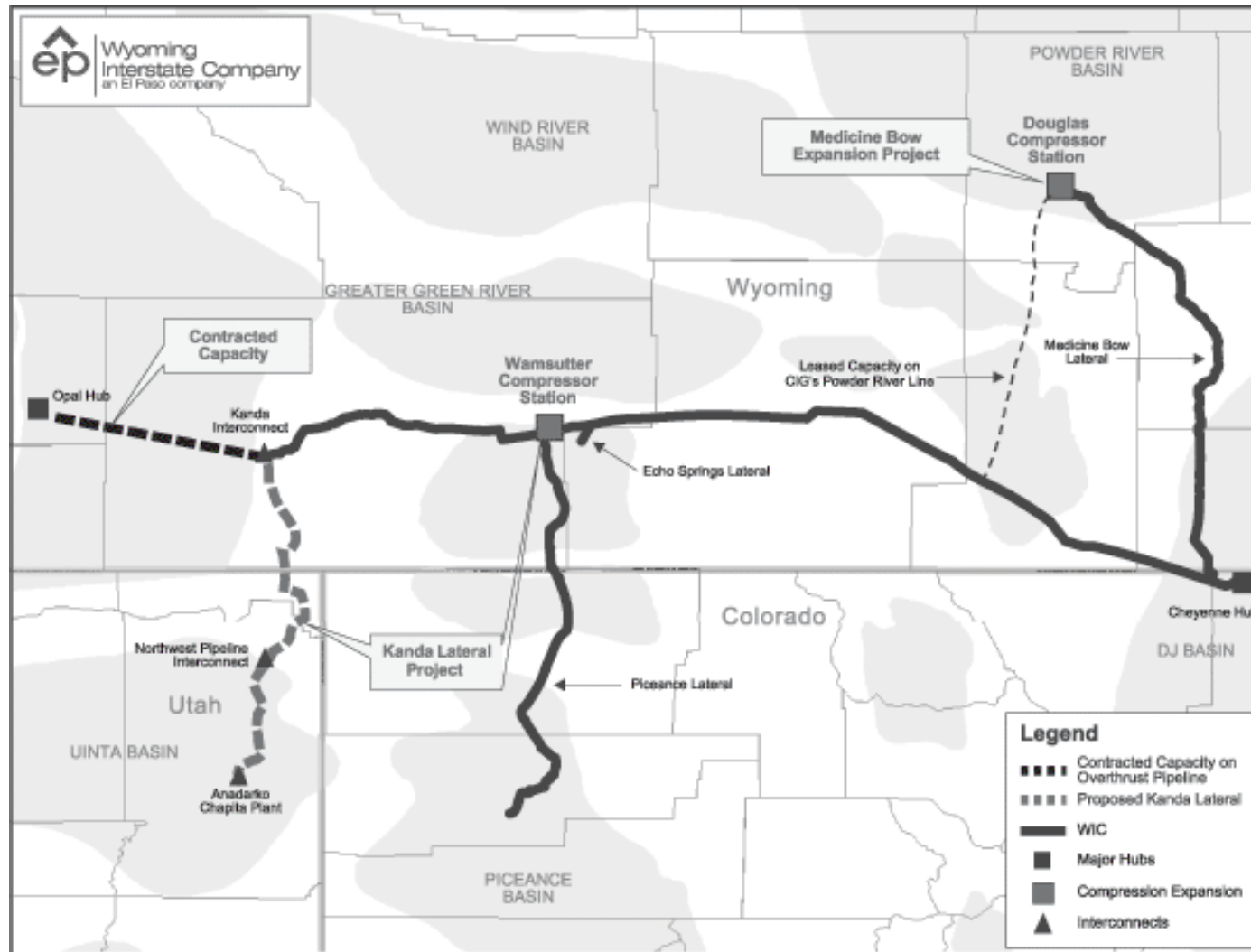
Source: Bentek Energy

# Growth in Piceance Basin Pipeline Take-away Capacity

	December 2005	February 2006	Summer 2006	Summer 2007	Summer 2008	Summer 2013
<b>CIG (Net)</b>	90,000	90,000	90,000	90,000	90,000	195,000
<b>Northwest Pipeline North</b>	330,000	330,000	330,000	330,000	780,000	800,000
<b>Northwest Pipeline South</b>	440,000	440,000	440,000	440,000	440,000	655,000
<b>Questar Pipeline (Net)</b>	25,000	25,000	25,000	25,000	25,000	35,000
<b>TransColorado</b>	350,000	385,000	385,000	385,000	385,000	385,000
<b>WIC</b>	30,000	30,000	350,000	350,000	350,000	552,000
<b>REX / Entrega (Segment 1)</b>		500,000	500,000	750,000	1,300,000	1,300,000
<b>Total Pipeline Export Capacity</b>	1,265,000	1,800,000	2,120,000	2,370,000	3,370,000	3,922,000

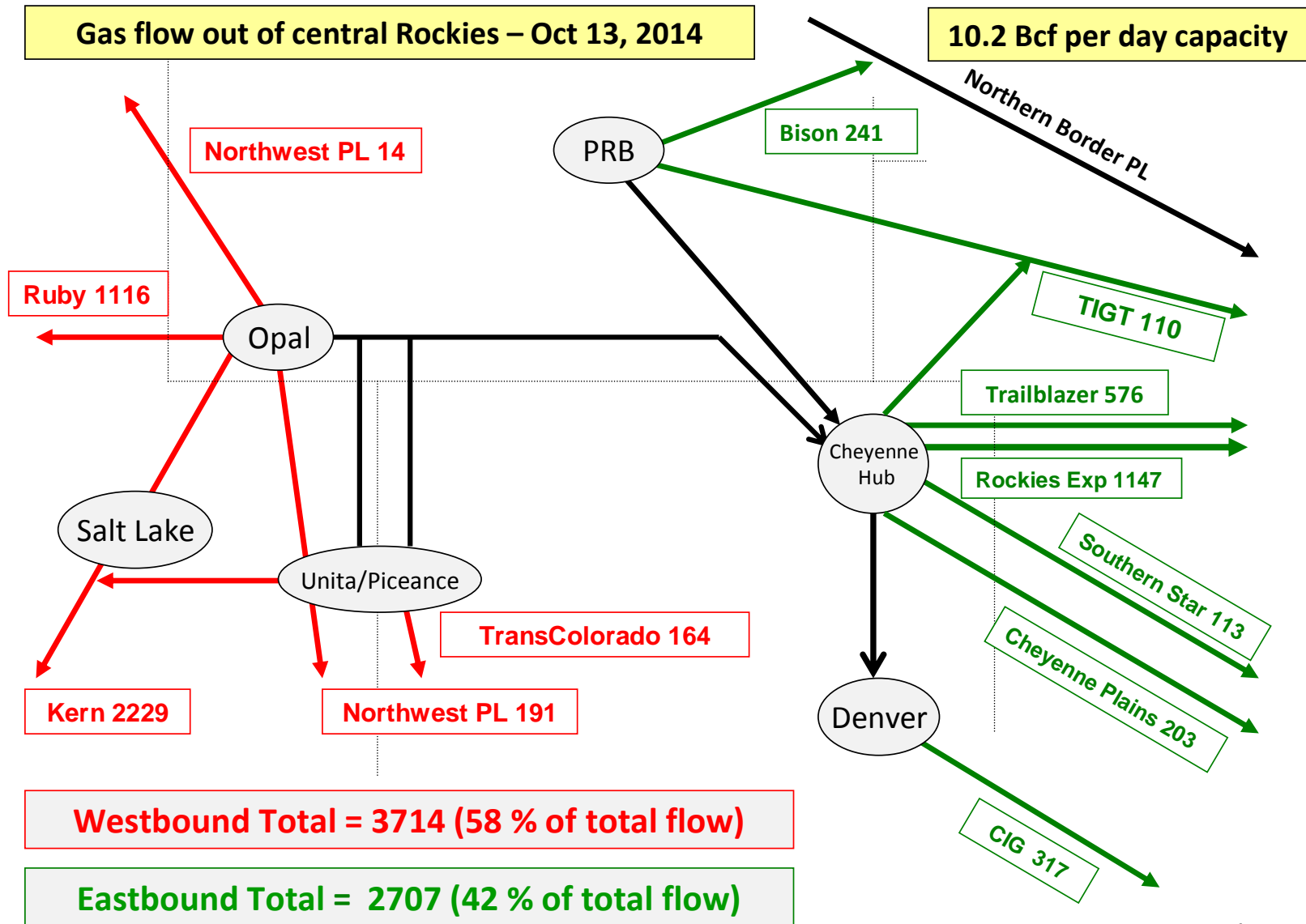
\* All numbers in MMBtu/Day

# Wyoming Interstate Company (WIC) System



Source: El Paso Pipeline Partners, L.P. Form S-1

# Rockies Pipeline Infrastructure



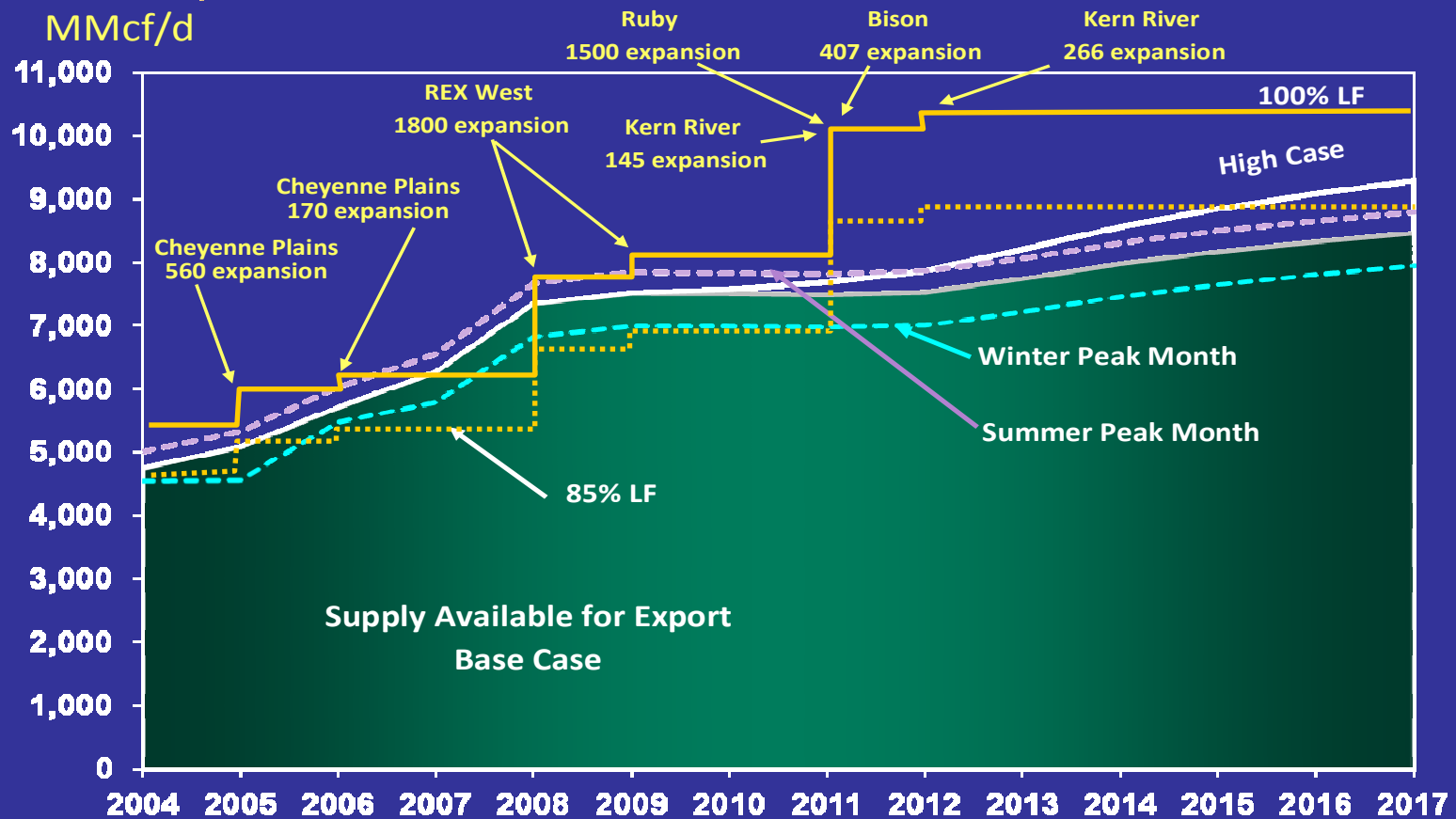
Source: Brian Jeffries, Wyoming Pipeline Authority (WPA)

# Rockies Supply vs. Regional Export Capacity

## Rockies Supply vs. Regional Export Capacity

1.5 Bcf/d Ruby

MMcf/d



Source: George Wayne, Wyoming Gas Fair – Rockies Market Update – 9/15/2011 presentation

# Current DOE LNG Export Approvals

Company	Maximum Non-FTA Quantity (BCF/D)
Sabine Pass Liquefaction, LLC	2.2
Freeport LNG Expansion, LP and FLNG Liquefaction, LLC	1.4
Lake Charles Exports, LLC	2.0
Dominion Cove Point LNG, LP	0.77
Freeport LNG Expansion, LP and FLNG Liquefaction, LLC*	0.4
Cameron LNG, LLC	1.7
Jordan Cove Energy Project, LLC	0.80
Total	9.27

Source: NERA Economic Consulting

# Pacific Connector Pipeline



Source: Oregon Green Energy Guide



## Export License Volumes for Canadian LNG Projects

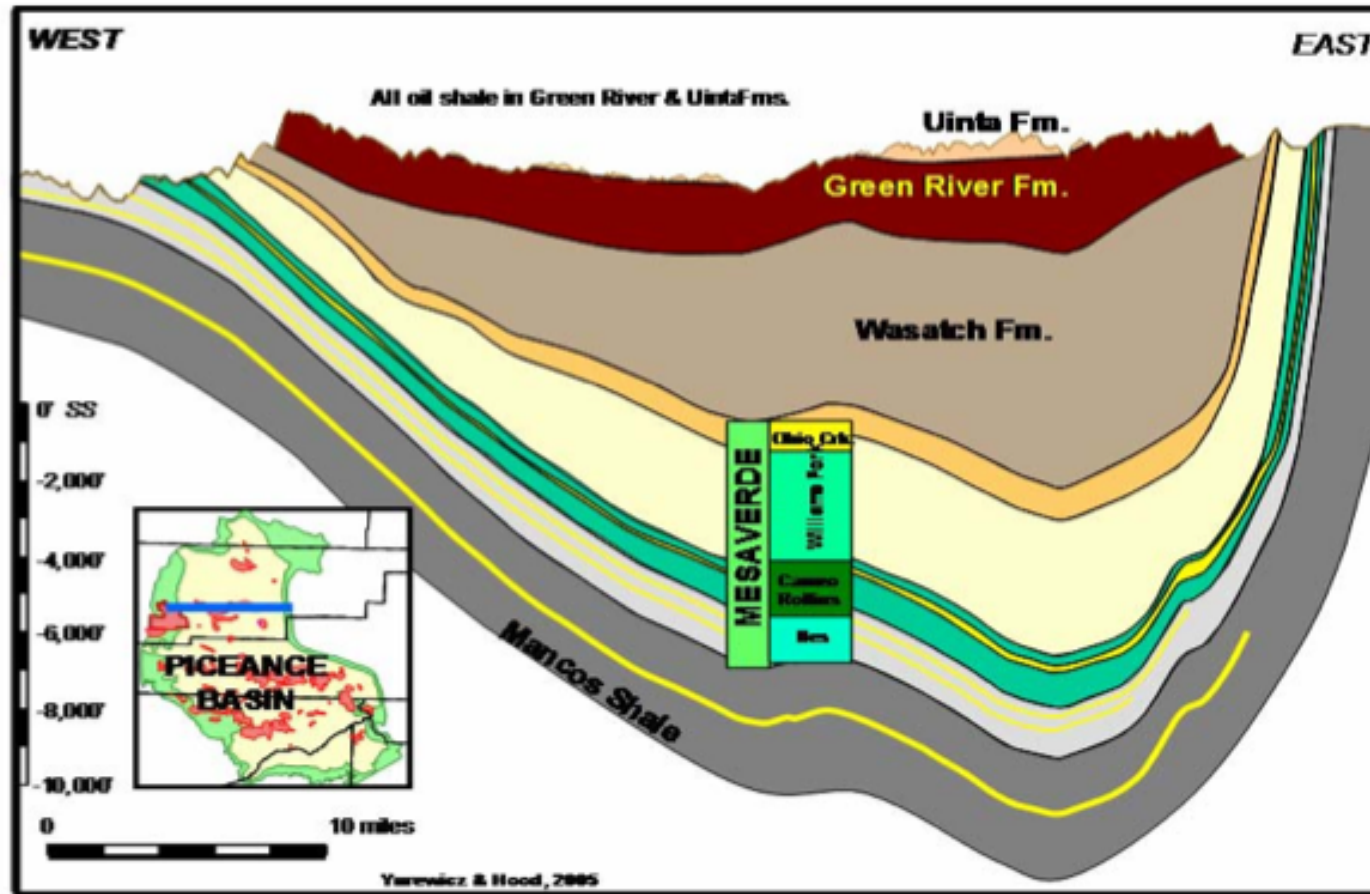
Project	Total (Tcf)	Annual (Tcf)	Daily (Bcf)
Aurora LNG	30.50	1.14	3.00
BC LNG <sup>1</sup>	1.69	0.08	0.23
Goldboro LNG <sup>2</sup>	7.30	0.51	1.40
Jordan Cove LNG <sup>3</sup>	15.63	0.63	1.55
Kitsault LNG	24.00	0.90	2.60
KM LNG <sup>1</sup>	9.36	0.47	1.28
LNG Canada <sup>1</sup>	32.90	1.18	3.20
Oregon LNG <sup>3</sup>	13.25	0.47	1.30
Pacific NorthWest LNG <sup>1</sup>	24.50	1.00	2.70
Prince Rupert LNG <sup>1</sup>	29.60	1.06	2.90
Stewart LNG	35.70	1.50	4.00
Triton LNG <sup>1</sup>	2.88	0.12	0.32
WCC LNG <sup>1</sup>	38.90	1.46	3.90
Woodfibre LNG <sup>1</sup>	2.62	0.11	0.29
<b>TOTALS</b>	<b>238.33</b>	<b>9.48</b>	<b>25.67</b>

<sup>1</sup>Canadian gas export license granted

<sup>2</sup>Nova Scotia terminal site

<sup>3</sup>Oregon terminal site

# Cross Section from West to East of the Piceance Basin



Source: Hood and Yurewicz, 2008

*Figure 3-3: Cross Section from West to East Across the North Central Portion of the Piceance Basin, Illustrating Basin Asymmetry and Synclinal Structure. Shows Relative Position of Oil-shale-bearing Strata of the Green River Formation Relative to the Deeper Gas Bearing Mesaverde Group.*

# Piceance Basin Producers Who Have Drilled Mancos Wells

- Encana Oil & Gas (USA) Incorporated
- Black Hills Plateau Production LLC
- Maralex Resources Incorporated
- WPX Energy Rocky Mountain LLC
- Chevron USA Incorporated
- Oxy USA WTP LP
- Piceance Energy LLC
- Gunnison Energy Corp

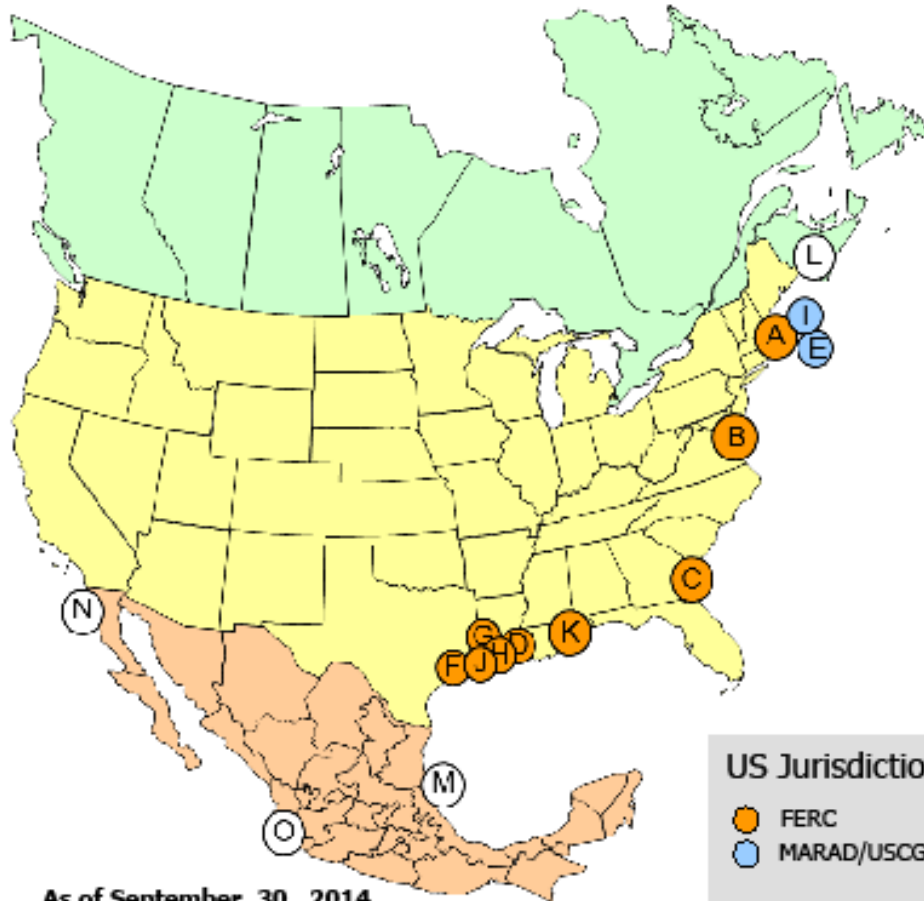
## Partial List of Current Piceance Basin Operators

- Encana Corporation
- WPX Energy
- Caerus Oil and Gas
- Gunnison Energy LLC
- Foundation Energy Management
- Vaquero Energy, Inc.
- Piceance Energy LLC
- Chevron Corporation
- Marathon Oil Corporation
- Occidental Petroleum Corporation
- Noble Energy Inc.
- Laramie Energy, LLC
- Mesa Energy Partners, LLC
- Southwestern Energy Ventures Company, LLC
- BOPCO, L.P.
- XTO Energy Inc.
- Wexpro
- Whiting Petroleum Corporation
- LINN Energy, LLC



# North American LNG Import/Export Term

*Existing*



As of September 30, 2014

*Note: There is an existing import terminal in Peñuelas, PR. It does not appear on this map since it can not serve or affect deliveries in the Lower 48 U.S. states.*

## U.S.

- A. Everett, MA : 1.035 Bcfd (GDF SUEZ - DOMAC)
- B. Cove Point, MD : 1.8 Bcfd (Dominion - Cove Point LNG)
- C. Elba Island, GA : 1.6 Bcfd (El Paso - Southern LNG)
- D. Lake Charles, LA : 2.1 Bcfd (Southern Union - Trunkline LNG)
- E. Offshore Boston: 0.8 Bcfd, (Excelebrate Energy – Northeast Gateway)
- F. Freeport, TX: 1.5 Bcfd, (Cheniere/Freeport LNG Dev.)★
- G. Sabine, LA: 4.0 Bcfd (Cheniere/Sabine Pass LNG)★
- H. Hackberry, LA: 1.8 Bcfd (Sempra - Cameron LNG)★
- I. Offshore Boston, MA : 0.4 Bcfd (GDF SUEZ – Neptune LNG)
- J. Sabine Pass, TX: 2.0 Bcfd (ExxonMobil – Golden Pass) (Phase I & II)
- K. Pascagoula, MS: 1.5 Bcfd (El Paso/Crest/Sonangol - Gulf LNG Energy LLC)

## Canada

- L. Saint John, NB: 1.0 Bcfd, (Repsol/Fort Reliance - Canaport LNG)

## Mexico

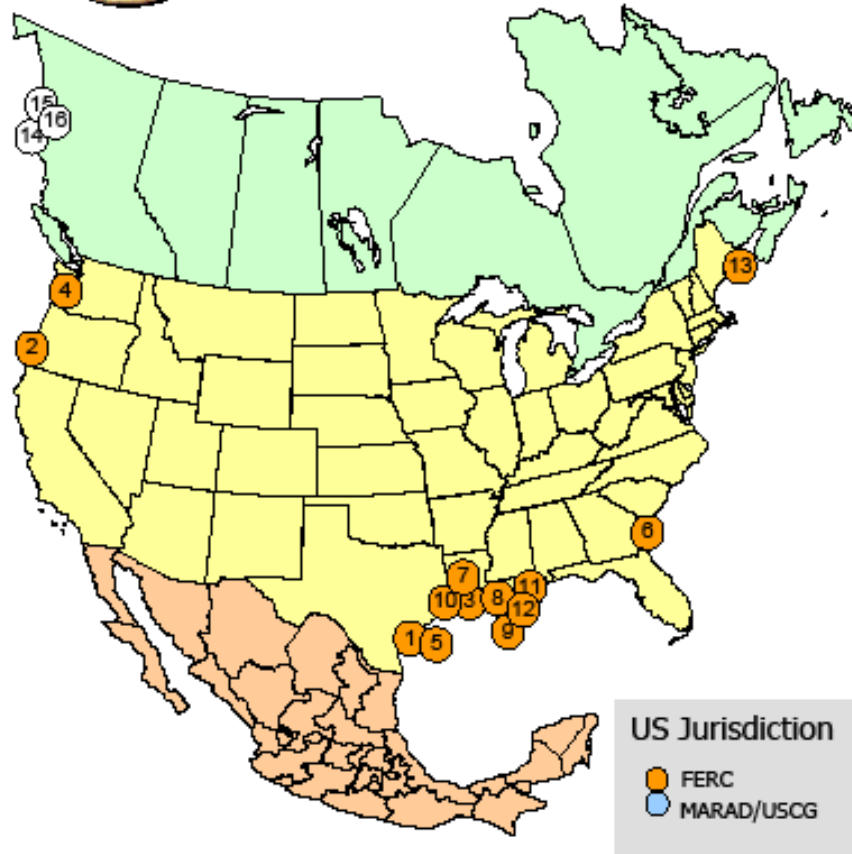
- M. Altamira, Tamulipas: 0.7 Bcfd, (Shell/Total/Mitsui – Altamira LNG)
- N. Baja California, MX: 1.0 Bcfd, (Sempra – Energia Costa Azul)
- O. Manzanillo, MX: 0.5 Bcfd (KMS GNL de Manzanillo)

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# Proposed LNG Export Facilities



## North American LNG Export Terminals *Proposed*



### Export Terminal PROPOSED TO FERC

1. **Corpus Christi, TX:** 2.1 Bcfd (Cheniere – Corpus Christi LNG) (CP12-507)
2. **Coos Bay, OR:** 0.9 Bcfd (Jordan Cove Energy Project) (CP13-483)
3. **Lake Charles, LA:** 2.2 Bcfd (Southern Union - Trunkline LNG) (CP14-120)
4. **Astoria, OR:** 1.25 Bcfd (Oregon LNG) (CP09-6)
5. **Lavaca Bay, TX:** 1.38 Bcfd (Exceleerate Liquefaction) (CP14-71 & 72)
6. **Elba Island, GA:** 0.35 Bcfd (Southern LNG Company) (CP14-103)
7. **Sabine Pass, LA:** 1.40 Bcfd (Sabine Pass Liquefaction) (CP13-552)
8. **Lake Charles, LA:** 1.07 Bcfd (Magnolia LNG) (CP14-347)
9. **Plaquemines Parish, LA:** 1.07 Bcfd (CE FLNG) (PF13-11)
10. **Sabine Pass, TX:** 2.1 Bcfd (ExxonMobil – Golden Pass) (CP14-517)
11. **Pascagoula, MS:** 1.5 Bcfd (Gulf LNG Liquefaction) (PF13-4)
12. **Plaquemines Parish, LA:** 0.30 Bcfd (Louisiana LNG) (PF14-17)
13. **Robbinston, ME:** 0.45 Bcfd (Kestrel Energy - Downeast LNG) (PF14-19)

### PROPOSED CANADIAN SITES IDENTIFIED BY PROJECT SPONSORS

14. **Kitimat, BC:** 1.28 Bcfd (Apache Canada Ltd.)
15. **Douglas Island, BC:** 0.23 Bcfd (BC LNG Export Cooperative)
16. **Kitimat, BC:** 3.23 Bcfd (LNG Canada)

As of September 30, 2014

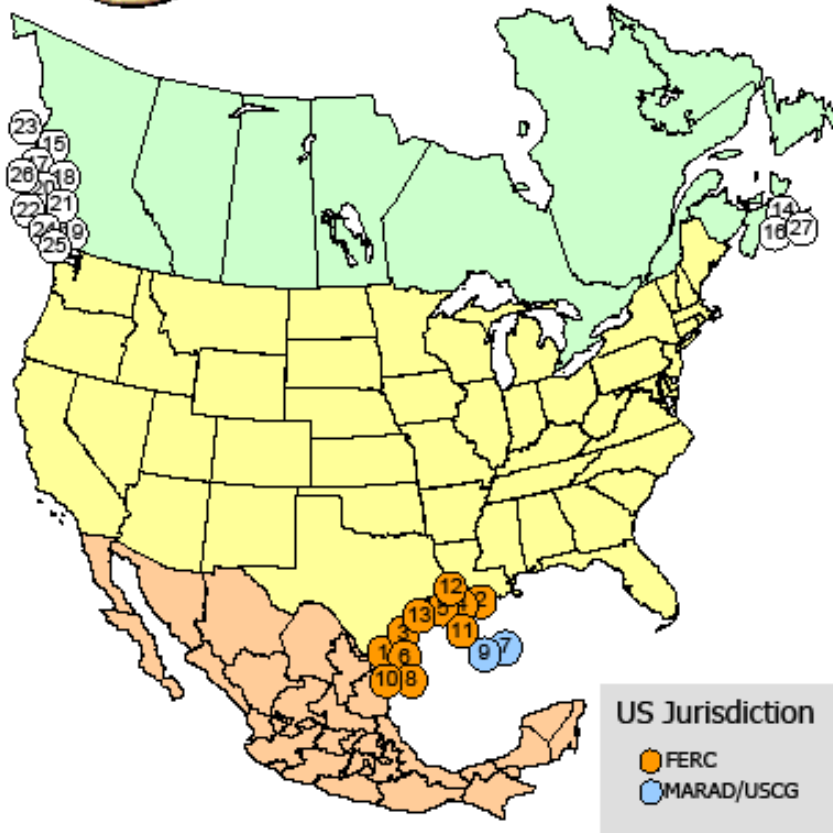
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# Potential LNG Export Facilities



## North American LNG Export Terminals *Potential*



### Export Terminal

#### POTENTIAL U.S. SITES IDENTIFIED BY PROJECT SPONSORS

1. Brownsville, TX: 2.8 Bcfd (Gulf Coast LNG Export)
2. Cameron Parish, LA: 0.16 Bcfd (Waller LNG Services)
3. Ingleside, TX: 1.09 Bcfd (Pangea LNG (North America))
4. Cameron Parish, LA: 0.20 Bcfd (Gasfin Development)
5. Cameron Parish, LA: 1.34 Bcfd (Venture Global)
6. Brownsville, TX: 3.2 Bcfd (Eos LNG & Barca LNG)
7. Gulf of Mexico: 3.22 Bcfd (Main Pass - Freeport-McMoRan)
8. Brownsville, TX: 0.94 Bcfd (Annova LNG)
9. Gulf of Mexico: 1.8 Bcfd (Delfin LNG)
10. Brownsville, TX: 0.27 Bcfd (Texas LNG)
11. Cameron Parish, LA: 1.60 Bcfd (SCT&E LNG)
12. Port Arthur, TX: 0.2 Bcfd (WesPac/Gulfgate Terminal)
13. Galveston, TX: 0.77 Bcfd (Next Decade)

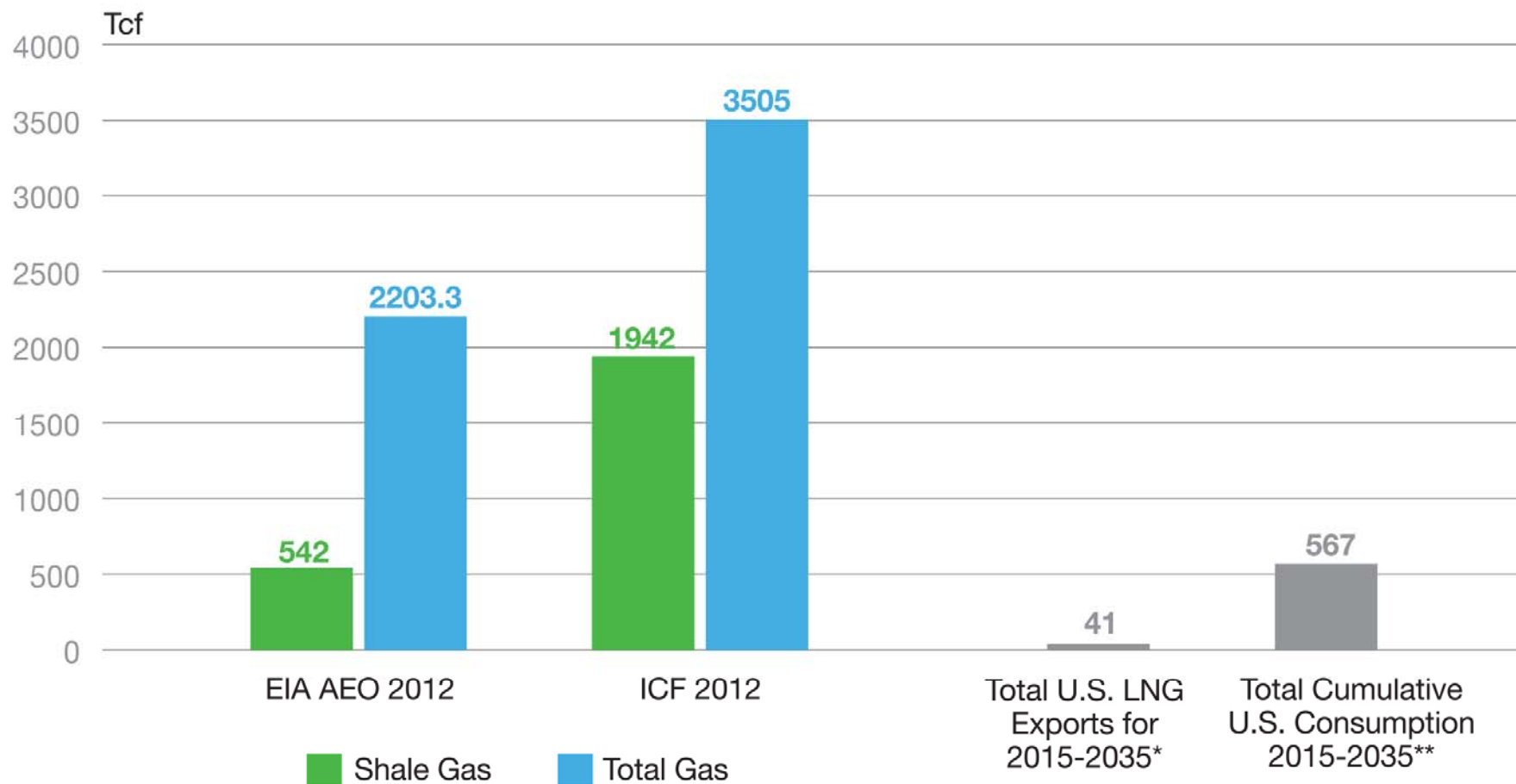
#### POTENTIAL CANADIAN SITES IDENTIFIED BY PROJECT SPONSORS

14. Goldboro, NS: 1.4 Bcfd (Pieridae Energy Canada)
15. Prince Rupert Island, BC: 2.91 Bcfd (BG Group)
16. Melford, NS: 1.8 Bcfd (H-Energy)
17. Prince Rupert Island, BC: 2.74 Bcfd (Pacific Northwest LNG)
18. Prince Rupert Island, BC: 4.0 Bcfd (ExxonMobil – Imperial)
19. Squamish, BC: 0.29 Bcfd (Woodfibre LNG Export)
20. Kitimat/Prince Rupert, BC: 0.32 Bcfd (Triton LNG)
21. Prince Rupert, BC: 3.12 Bcfd (Aurora LNG)
22. Kitsault, BC: 2.7 Bcfd (Kitsault Energy)
23. Stewart, BC: 4.1 Bcfd (Canada Stewart Energy Group)
24. Delta, BC: 0.4 Bcfd (WesPac Midstream Vancouver)
25. Vancouver Island, BC: 0.11 Bcfd (Steelhead LNG)
26. Prince Rupert Island, BC: 3.2 Bcfd (Orca LNG)
27. Port Hawkesbury, NS: 0.5 Bcfd (Bear Head LNG)

As of September 30, 2014

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## Estimates of U.S. Total Natural Gas Resource Base vs. Total U.S. LNG Exports and Consumption



Source

\*20 years of 6 Bcf/d of LNG exports phased in between 2015 and 2020 reaching 6 Bcf/d in 2020 and thereafter.

\*\*Source: EIA AEO 2013ER.



# World LNG Liquefaction Capacity (BCF/D)

Includes Facilities that are Existing, Under Construction & Proposed

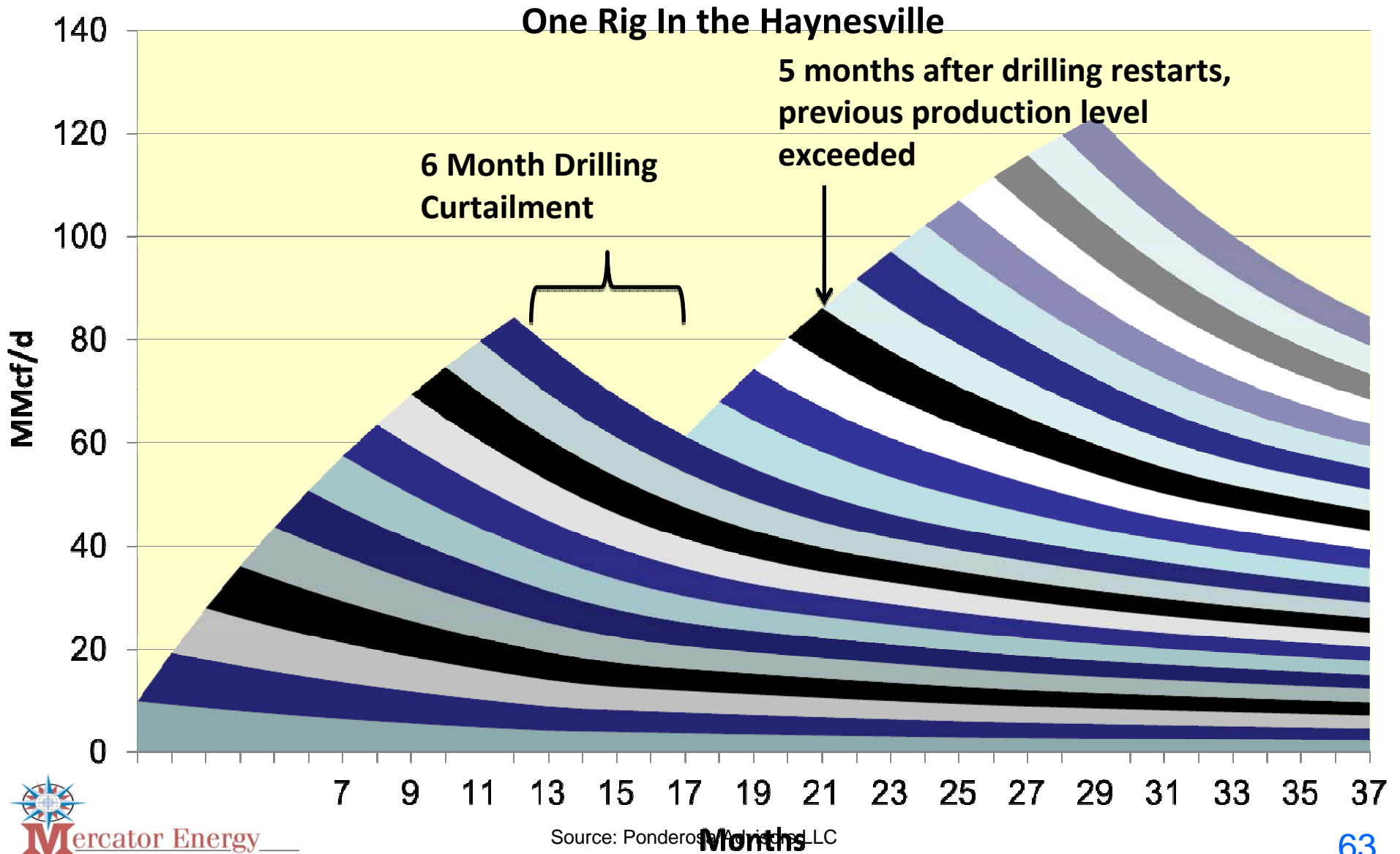
	2011	2012	2013	2014	2015	2016	2017	2018	2019
Algeria	3.08	3.08	4.36	4.36	4.36	4.36	4.36	4.36	4.36
Angola	0.00	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73
Australia	2.79	3.39	3.39	6.68	9.73	12.15	15.46	16.30	16.30
Brunei	1.01	1.01	1.01	1.01	1.57	1.57	1.57	1.57	1.57
Canada	0.00	0.00	0.00	0.00	0.25	0.25	0.98	1.99	3.78
Egypt	1.71	1.71	1.71	1.71	2.41	2.41	2.41	2.41	2.41
Equatorial Guinea	0.52	0.52	0.52	0.52	0.52	1.13	1.13	1.13	1.13
Indonesia	4.21	4.21	4.21	4.48	4.48	4.48	4.48	4.48	4.48
Libya	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32
Malaysia	3.36	3.36	3.36	3.36	3.36	3.81	3.81	3.81	3.81
Nigeria	2.96	2.96	2.96	2.96	8.83	8.83	8.83	8.83	8.83
Norway	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.59
Oman	1.44	1.44	1.44	1.44	1.44	1.44	1.44	1.44	1.44
Papua New Guinea	0.00	0.00	0.00	0.92	0.92	0.92	0.92	0.92	0.92
Peru	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62
Qatar	10.78	10.78	10.78	10.78	10.78	10.78	10.78	10.78	10.78
Russia	1.34	1.34	1.34	1.34	1.34	3.65	5.33	5.33	5.33
Trinidad	2.16	2.16	2.16	2.16	2.88	2.88	2.88	2.88	2.88
UAE	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
United States	0.00	0.00	0.00	0.00	2.52	2.52	7.18	11.38	11.38
Yemen	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
<b>Total</b>	<b>38.61</b>	<b>39.94</b>	<b>41.22</b>	<b>45.70</b>	<b>59.38</b>	<b>65.18</b>	<b>75.55</b>	<b>81.60</b>	<b>83.39</b>

# Job Implications

- **Rig crews – 30 people/rig**
- **Colorado-Headquartered Producer Offices**
  - Contract workers (Bonanza Creek has already cut their contract positions)
  - Employees (Magnum Hunter and LINN Energy closing Denver offices)
  - Office consolidations (WPX Energy consolidating Denver office and relocating staff to Tulsa)
- **Service Companies (Schlumberger, Halliburton, Baker Hughes, etc)**
  - Halliburton to cut 6,400 globally
  - Baker Hughes to cut 7,000 globally
  - Schlumberger to cut 9,000 globally
- **Support Workers**
  - Electricians, Welders, etc



# The “Ferrari” Affect Substantially Reduces The Likelihood Of Price Spikes



# Winners

- China/Asia
- Consumer growth; consumer spending
- U.S. nitrogen fertilizer industry
- Steel producers
- Refiners
- Chemical producers
- Aluminum smelters
- Natural gas fired electric generators

# Losers

- U.S. Energy Security
- State and local governments in oil & gas producing states
- Oil & gas E&P's
- Oil & gas employment
- Oil & gas service companies
- U.S. LNG exporters who have not made a Final Investment Decision will face delays
- Renewable energy sector – cheap energy will destroy the “Green Revolution”
- Russia, Iran, Venezuela

# Conclusions

- Crude and NGL prices won't recover for at least 2 years
- U.S. crude, NGL & natural gas production won't decline as quickly as OPEC expects
- U.S. producers will allocate capital to their highest IRR projects
- U.S. "short cycle" drilling (dependent on near term quarter cash flow) will result in U.S. drillers feeling most of the pain
- The "recovery time" will exceed any hedge terms

# What we must recognize and what we must do.

- We must recognize that we are in a global market place and competing with other production areas.
- We must market and sell Western Colorado's strengths.
  - Predictability and repeatability in production
  - Available gathering and natural gas processing capacity
  - Significant interstate pipeline export capacity
  - A ready and available work force
  - A welcoming political and regulatory environment



# How Long Will We Be Stuck in This Ditch?





# What Will Help Us Get Out? Ourselves.



# 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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Ponderosa Advisors LLC  
Office of Energy Projects  
Bloomberg  
U.S. Department of Energy  
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Platts Inside FERC Gas Market Report, A McGraw Hill Publication  
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LNG World News  
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Encana Corporation  
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National Energy Board  
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Colorado Interstate Gas, George Wayne  
Tea Party Command Center  
Tudor Pickering Holt & Co.

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