

How Horizontal Drilling & Fracturing Technologies Are Changing Natural Gas Markets

Presented to:

**Senate & House Resources and EDT Joint Committee Meeting
*State of Alaska***

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Key Points

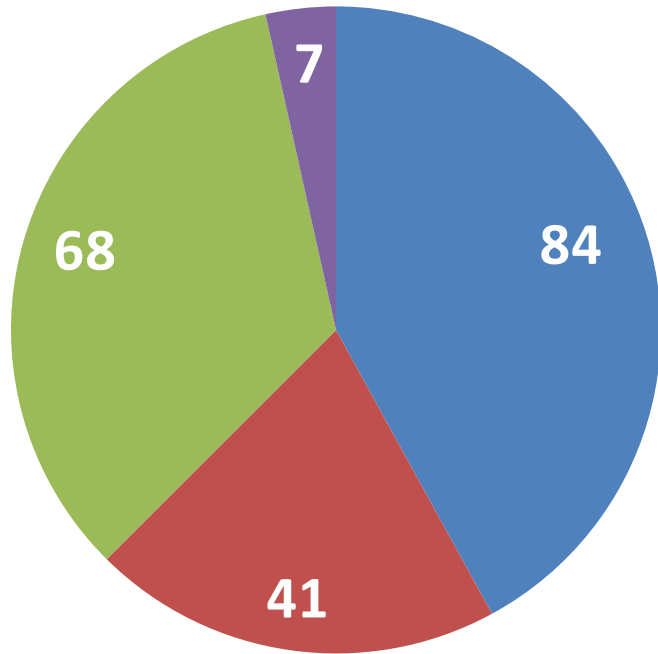
- ❖ **The Energy World has changed. Technology has unlocked unconventional gas resources.**
- ❖ **Natural gas should no longer be viewed as unavailable, unreliable or too expensive.**
- ❖ **Due to unconventional gas production, the US has become supply long, prices are falling and consumers will benefit.**
- ❖ **Burgeoning supplies are overwhelming the nation's pipeline capacity, driving prices even lower.**
- ❖ **The production growth creates an historic opportunity to use gas to quickly and significantly reduce our GHGs and reduce our consumption of oil and other high emission fuels.**

Presentation Outline

- ❖ **US Supply Explodes: What happened in 2008**
- ❖ **Why It Happened: Impact of technology innovation**
- ❖ **What are the Impacts?**
- ❖ **Recent Activity**
- ❖ **Conclusions and Implications**

Who Is BENTEK?

Distribution of Customers



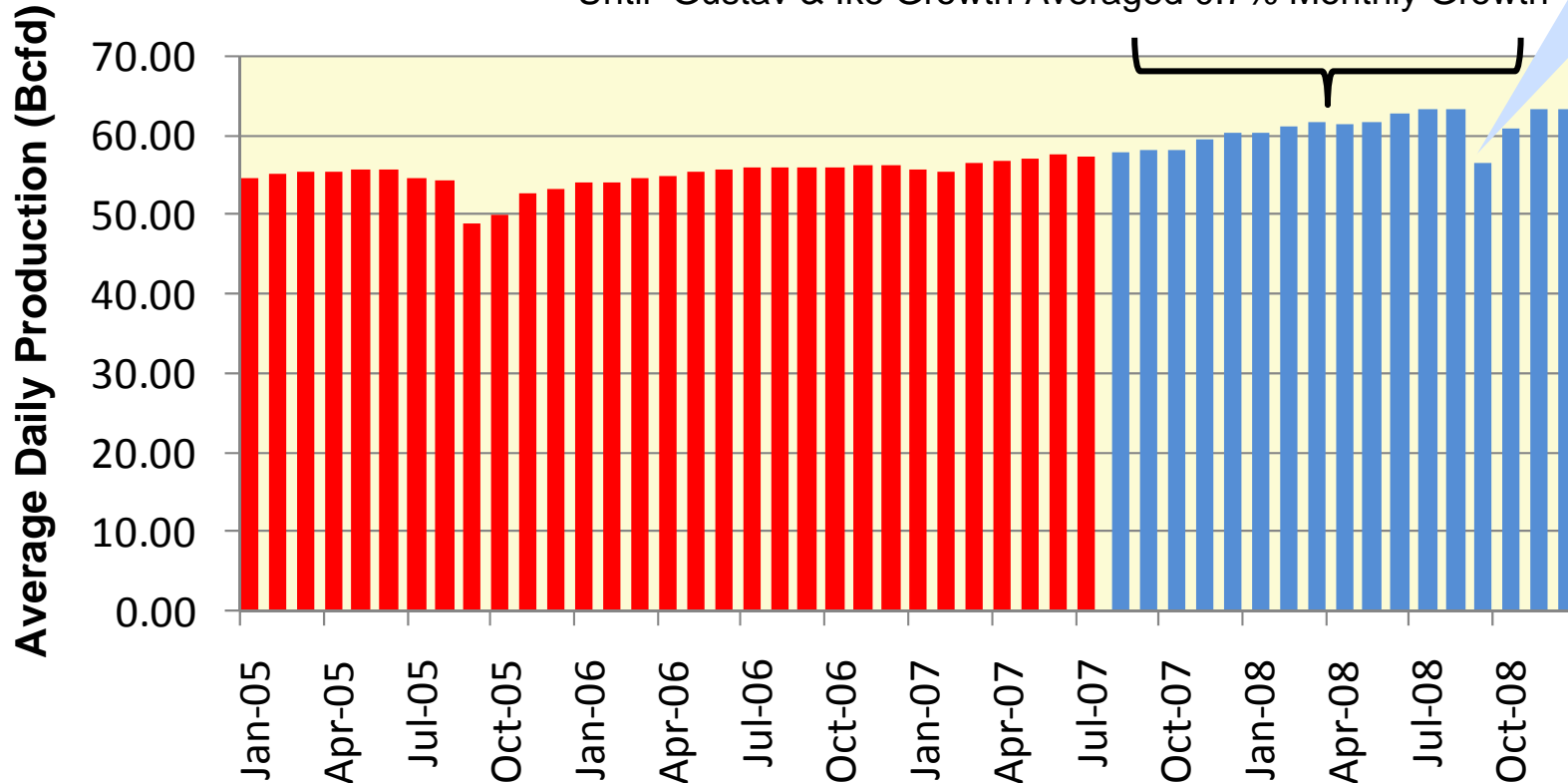
- Majors, Producers, Mktrs, Industrials
- Pipelines, Utilities, Midstream
- Financial and Hedge
- Government, Associations, Consultants

- ❖ BENTEK is the leading energy analytics firm
- ❖ We provide:
 - Daily assessments of the US natural gas market fundamentals
 - Analysis of major market developments
 - Near real-time Market Fundamentals Data
 - Consulting and Advisory Services
- ❖ Over 200 clients include producers, marketers pipelines, banks, LDCs and end users
 - FERC
 - MMS
 - State PUCs via NARUC

Production Grew In 2008 By 4 Bcfd

08 Production Is Up 7% Over 07

Until Gustav & Ike Growth Averaged 0.7% Monthly Growth

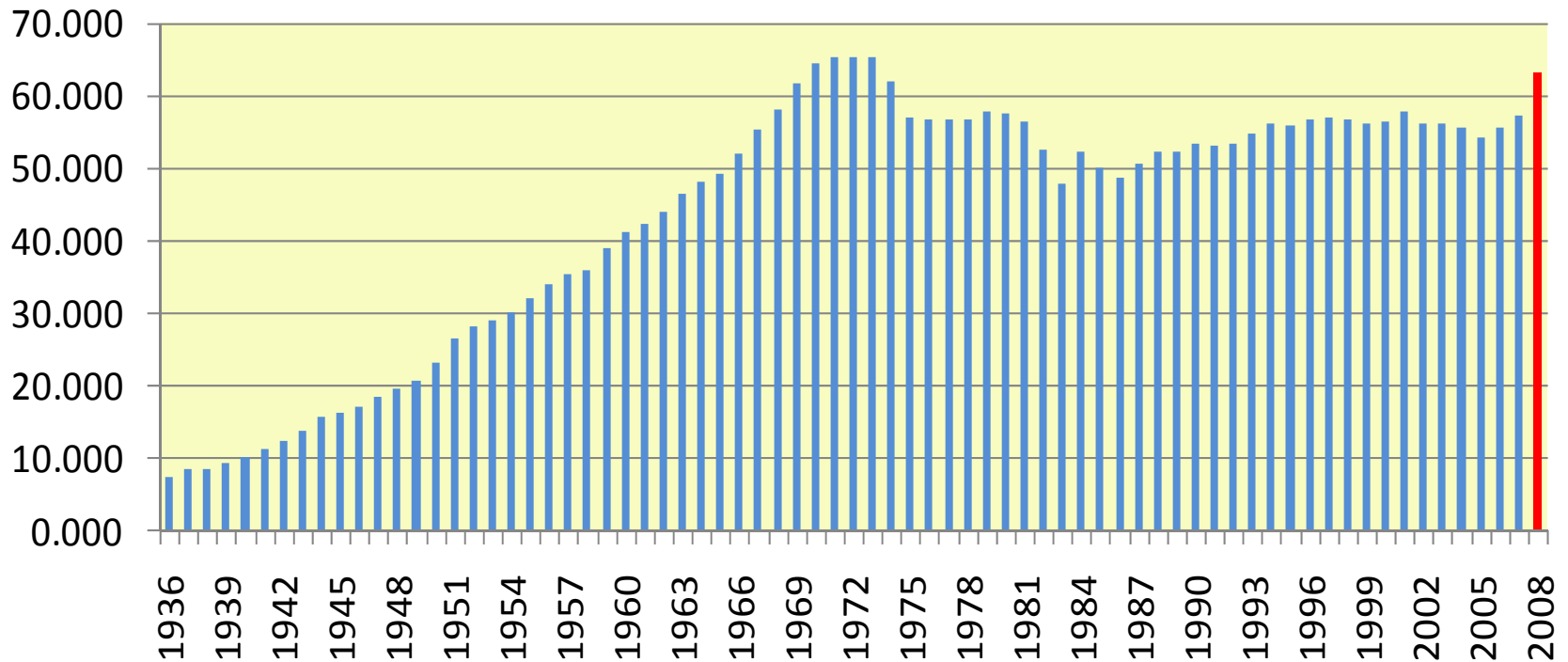


Almost 4.0
Bcfd lost to
H'canes

Source: EIA 914 Report
(Gross Withdrawals)

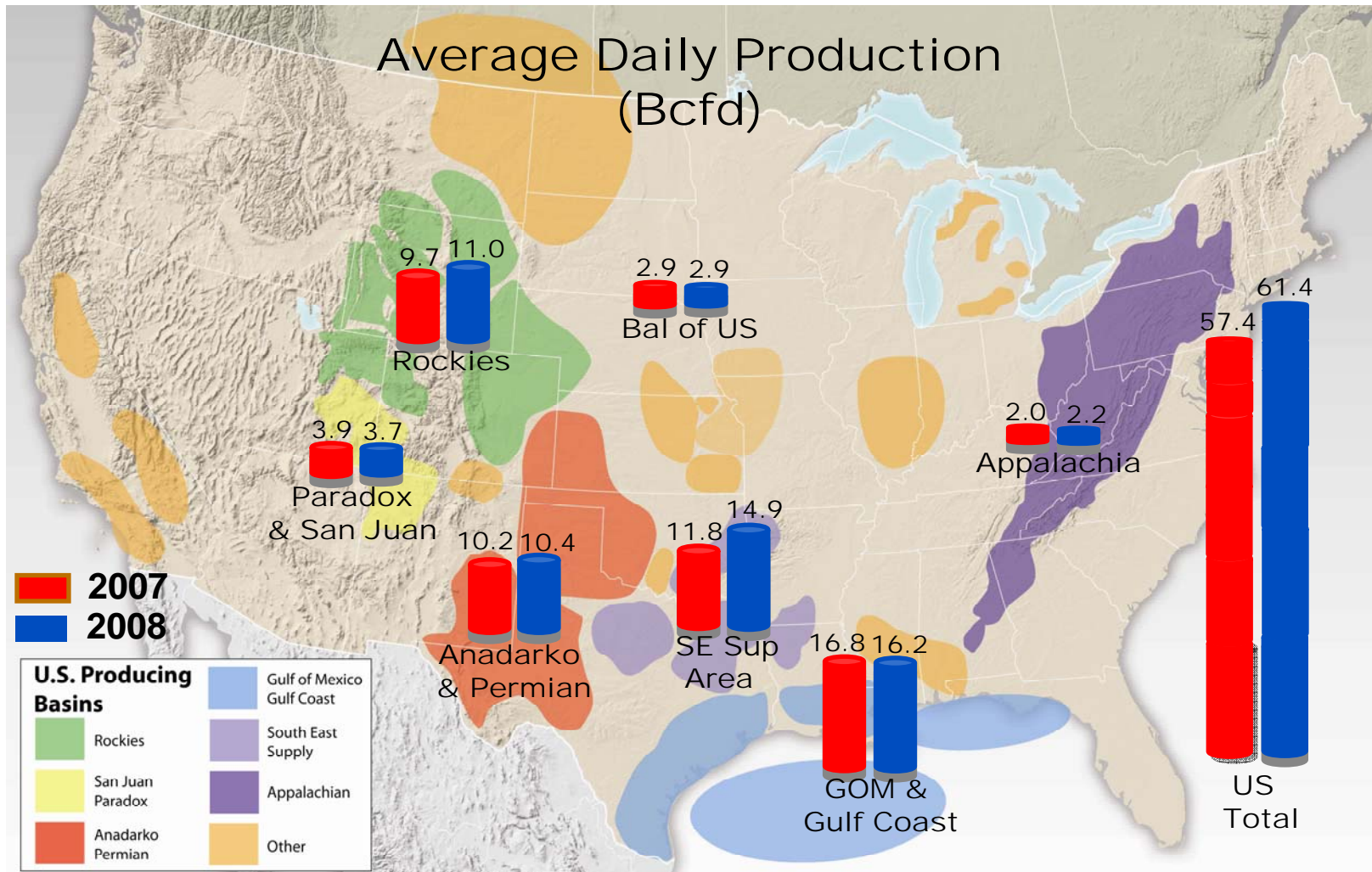
Production Is Nearing Historic Highs

Lower 48 Gross Withdrawals (Bcfd)

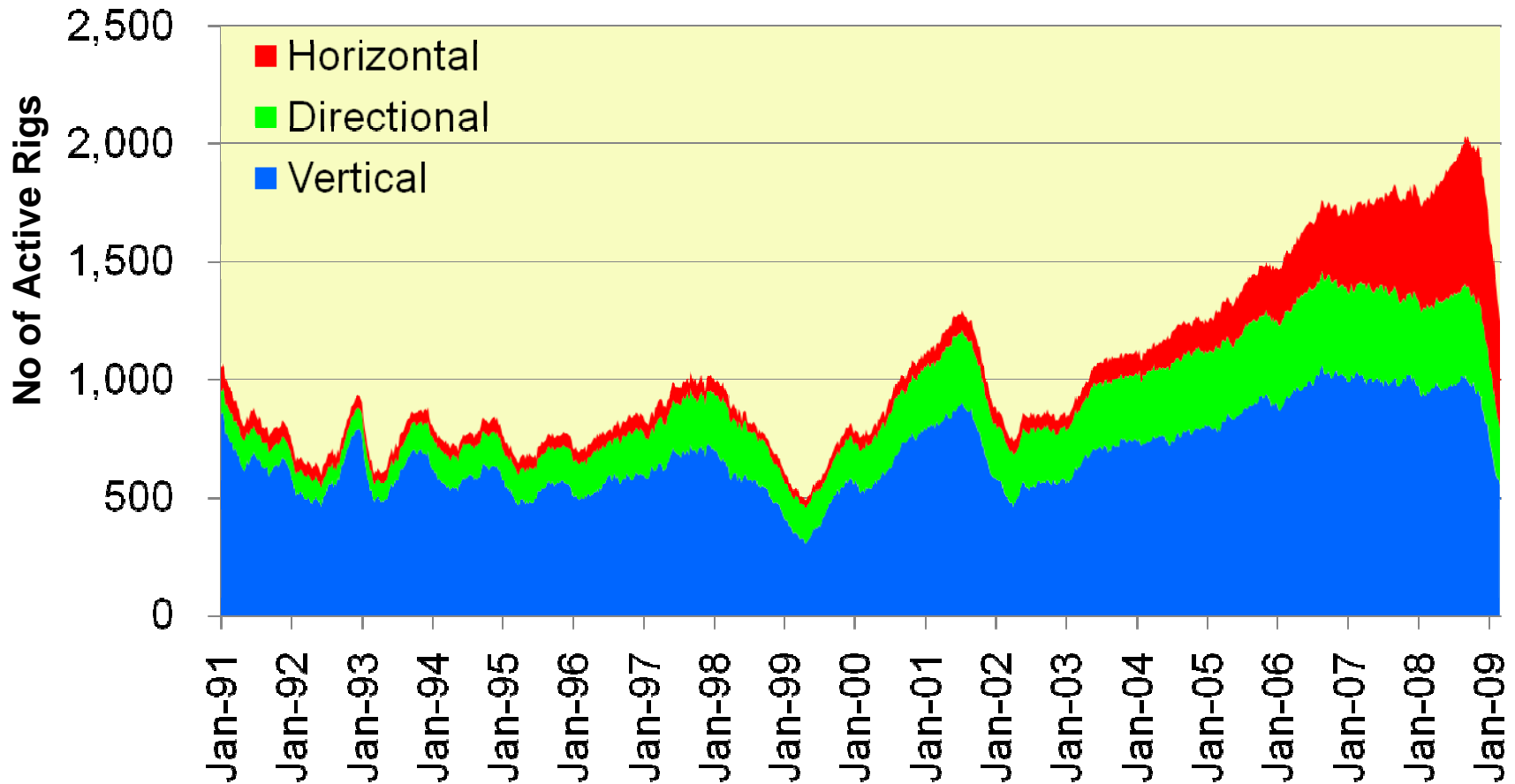


Source: EIA, BENTEK

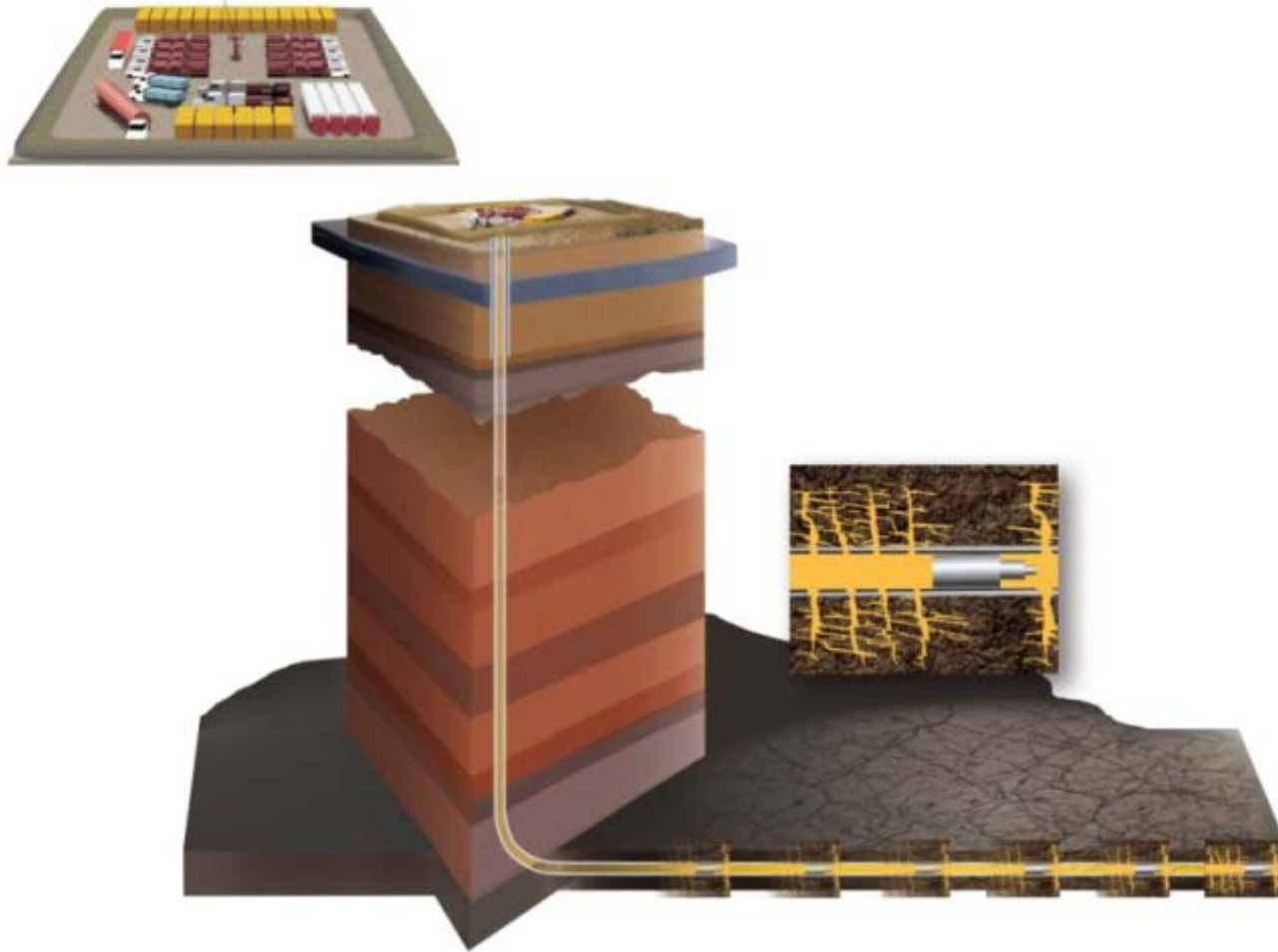
Growth Was Greatest In The Non-Conventional Supply Regions



Drilling Reflects The Shift To Unconventional Production

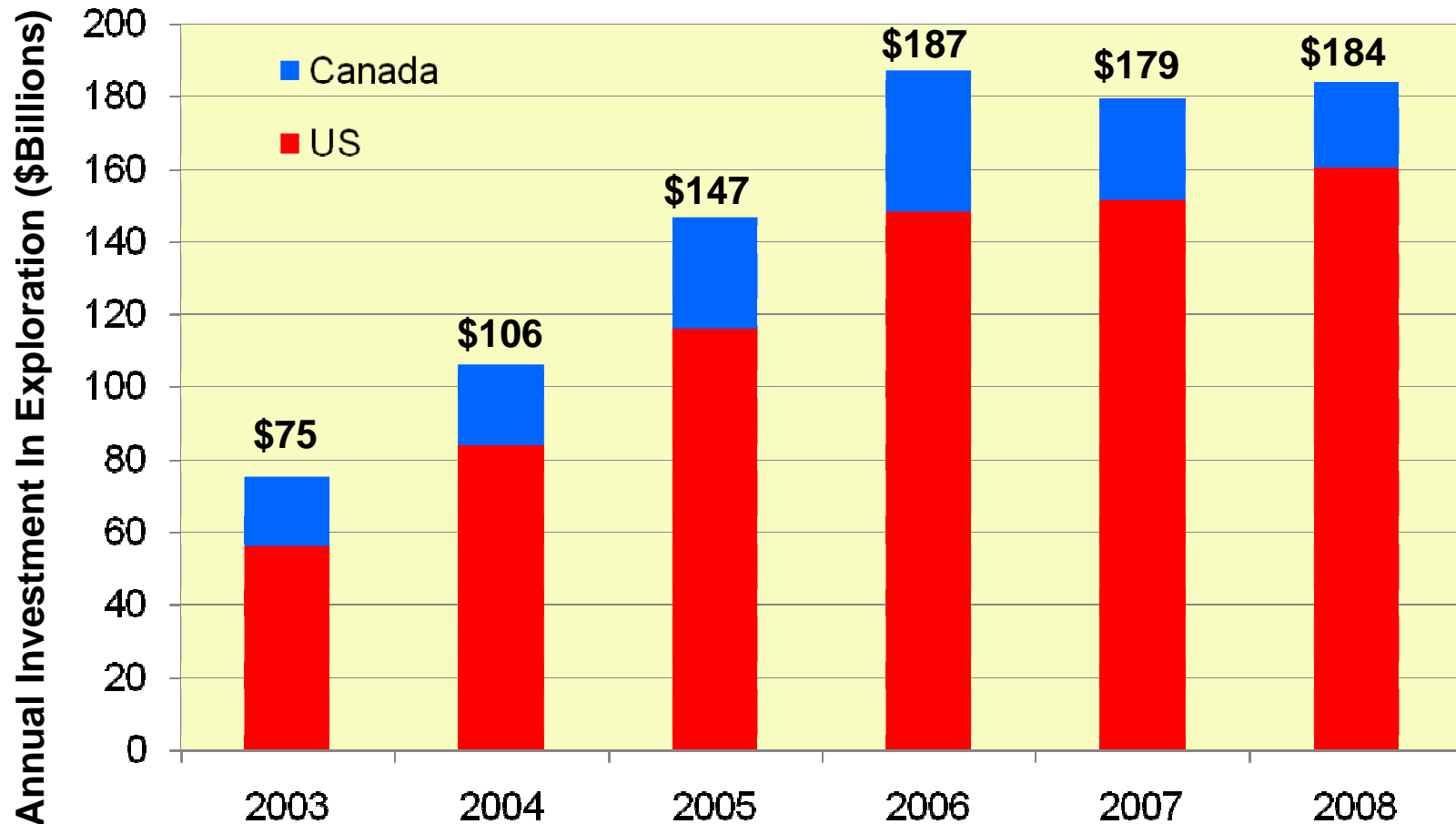


Innovative Fracing Technology Is Driving The Growth



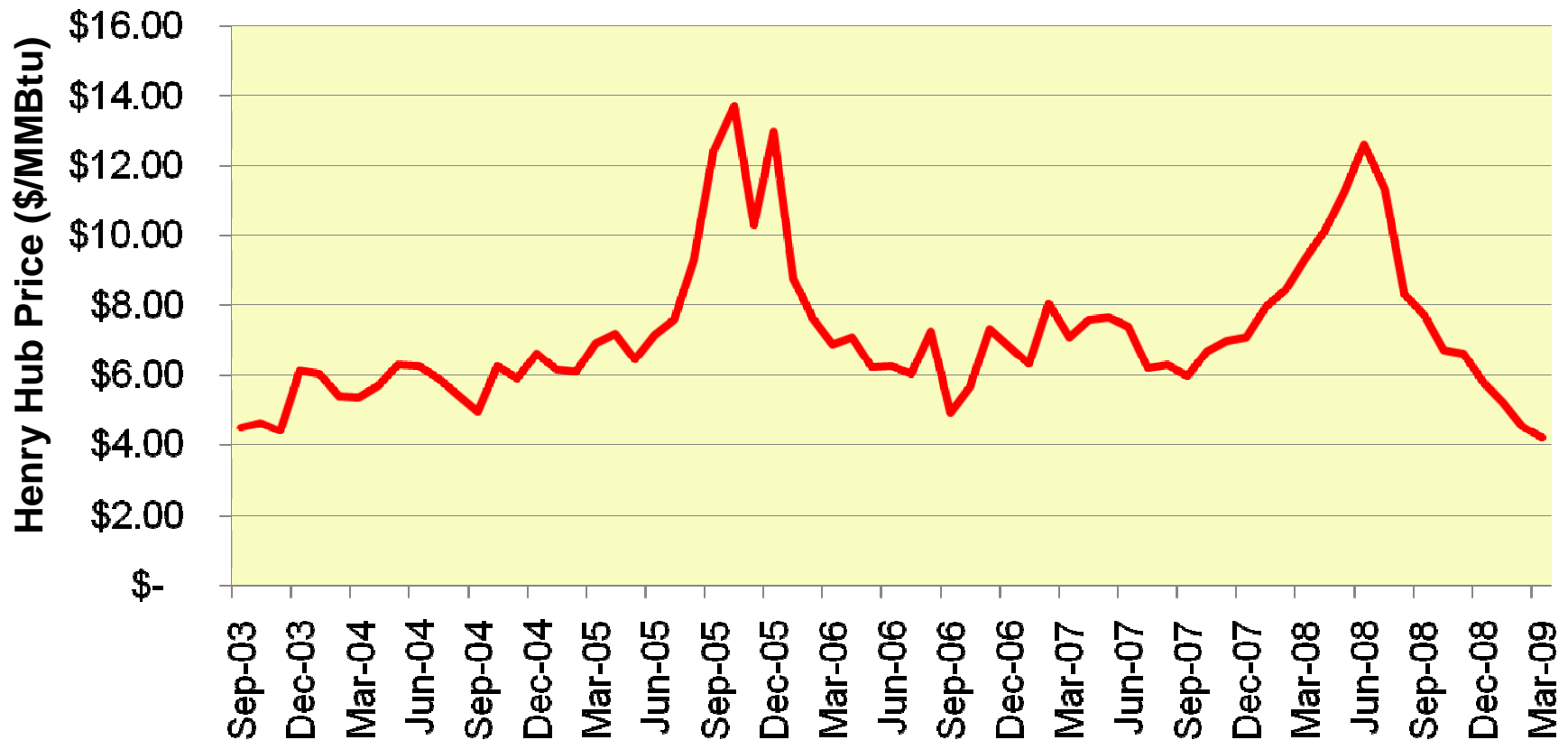
Source: *Hydraulic Fracturing Factsheet*, prepared by
Chesapeake Energy, February 2009

Producers Have Invested Nearly \$1 Trillion On Exploration Since 03



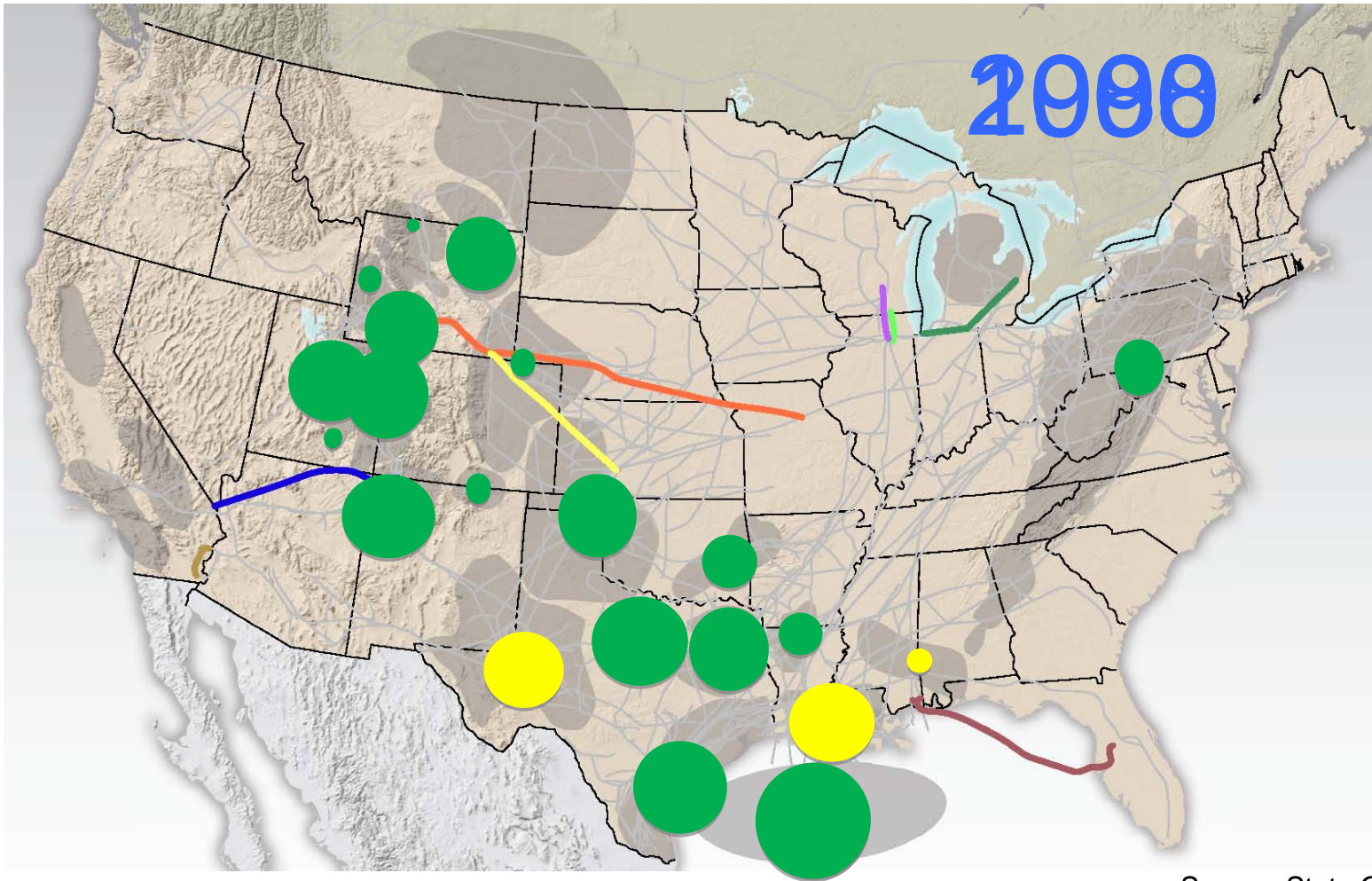
Source: Oil and Gas Journal, Penwell Publications

Natural Gas Prices Are Falling Precipitously



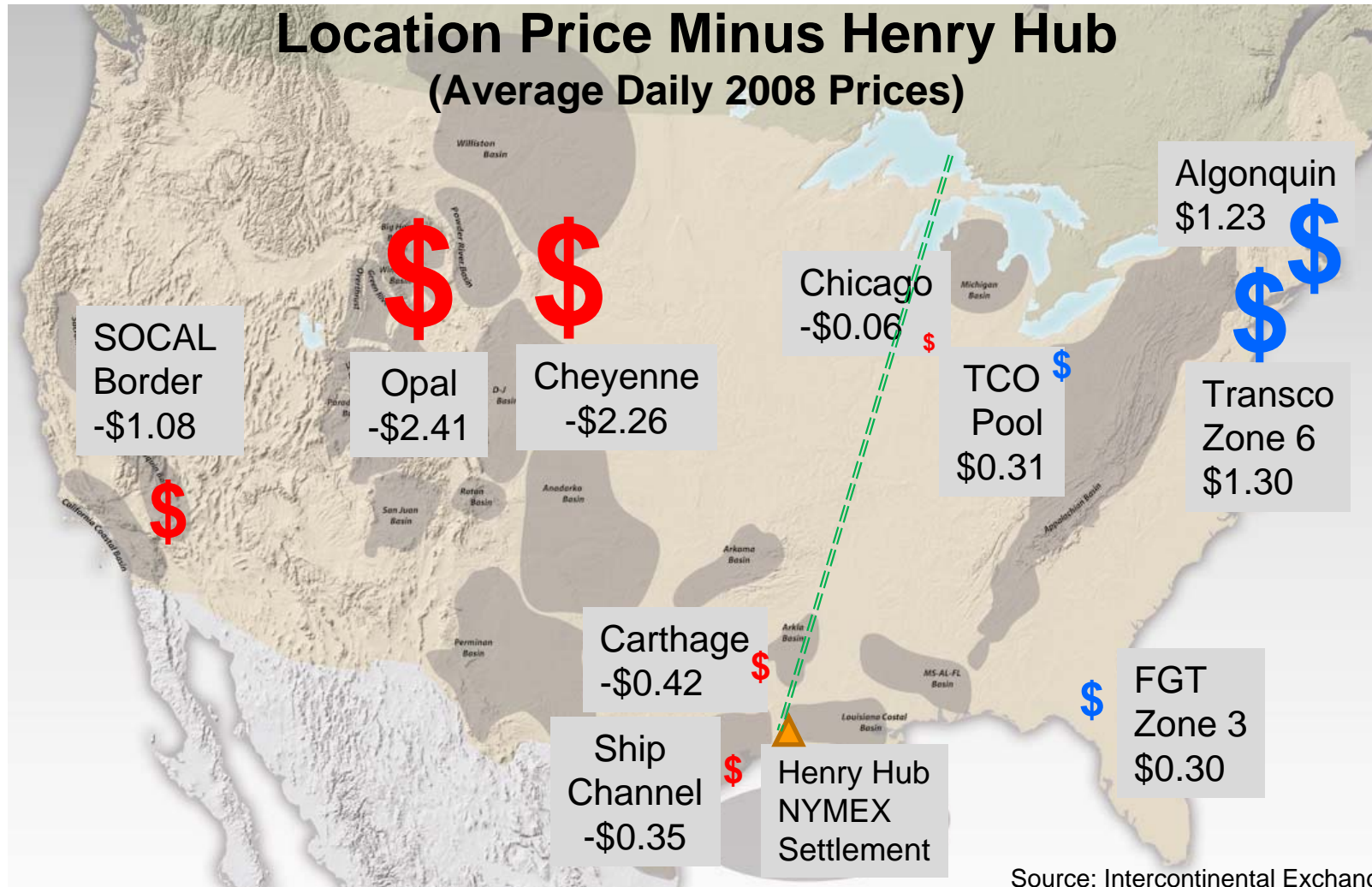
Source: ICE

The Geography of Production Is Changing

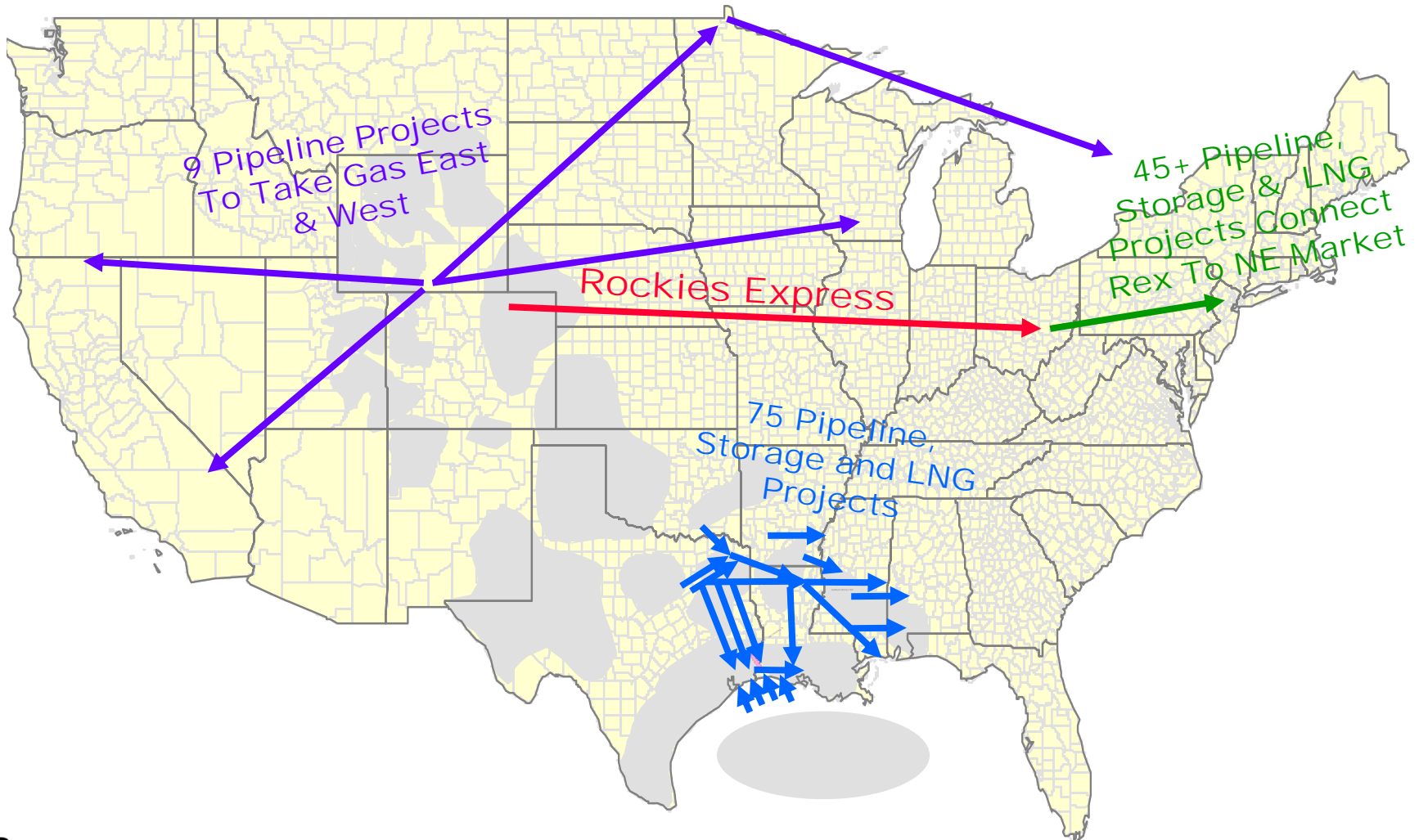


Source: State Oil & Gas
Commission Reports

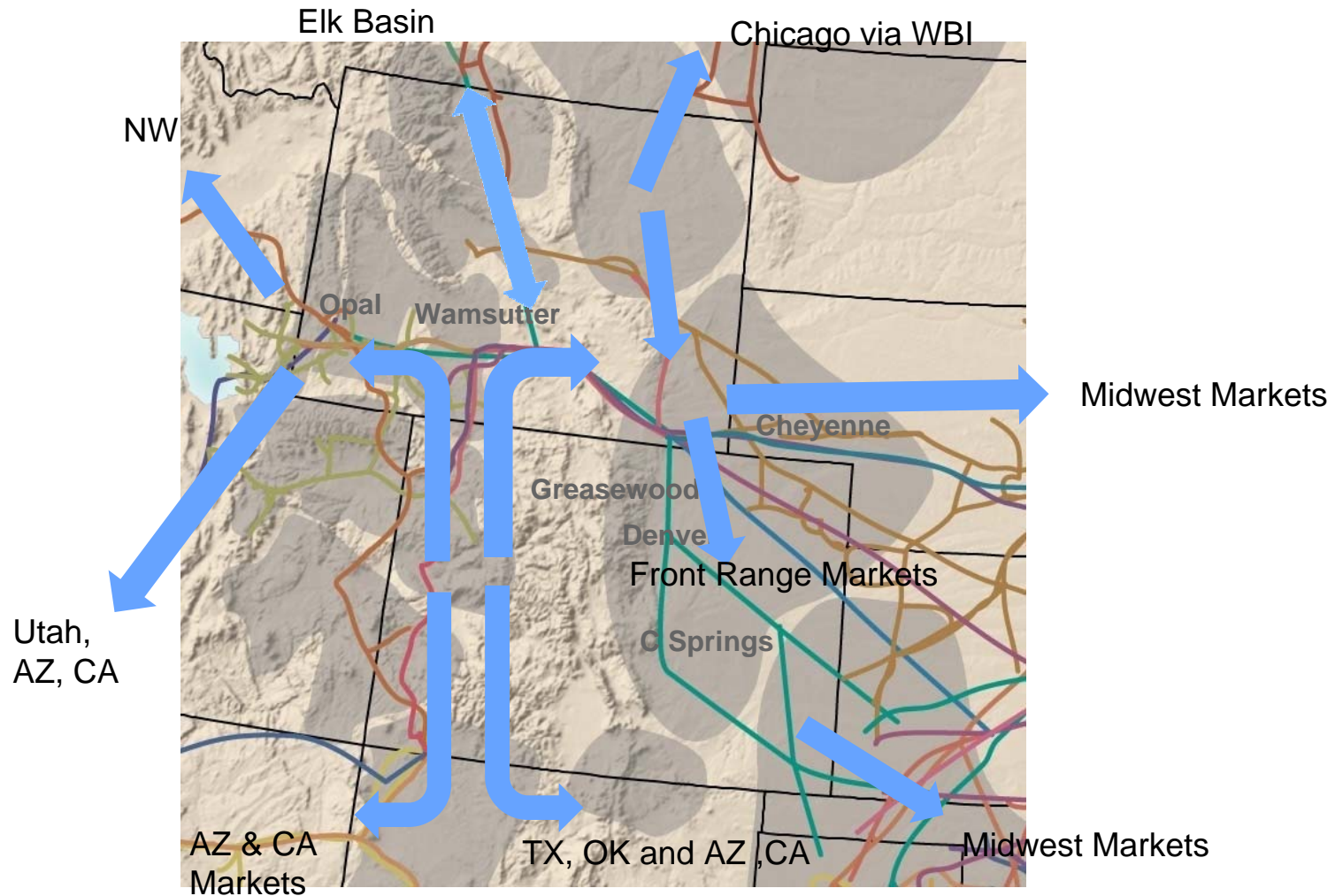
Pipeline Constraints Create Price Anomalies



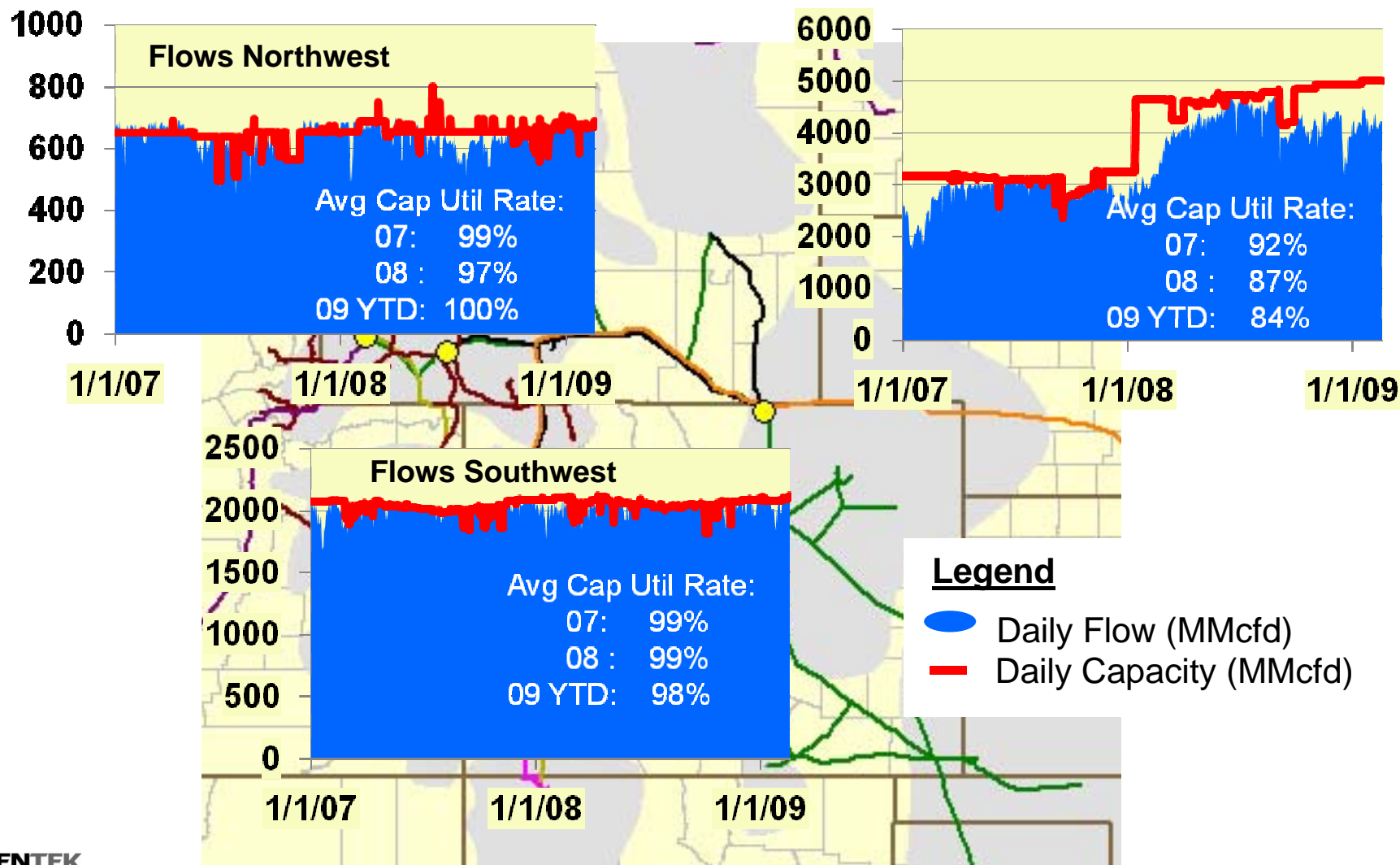
Billions Are Being Invested To Connect New Production



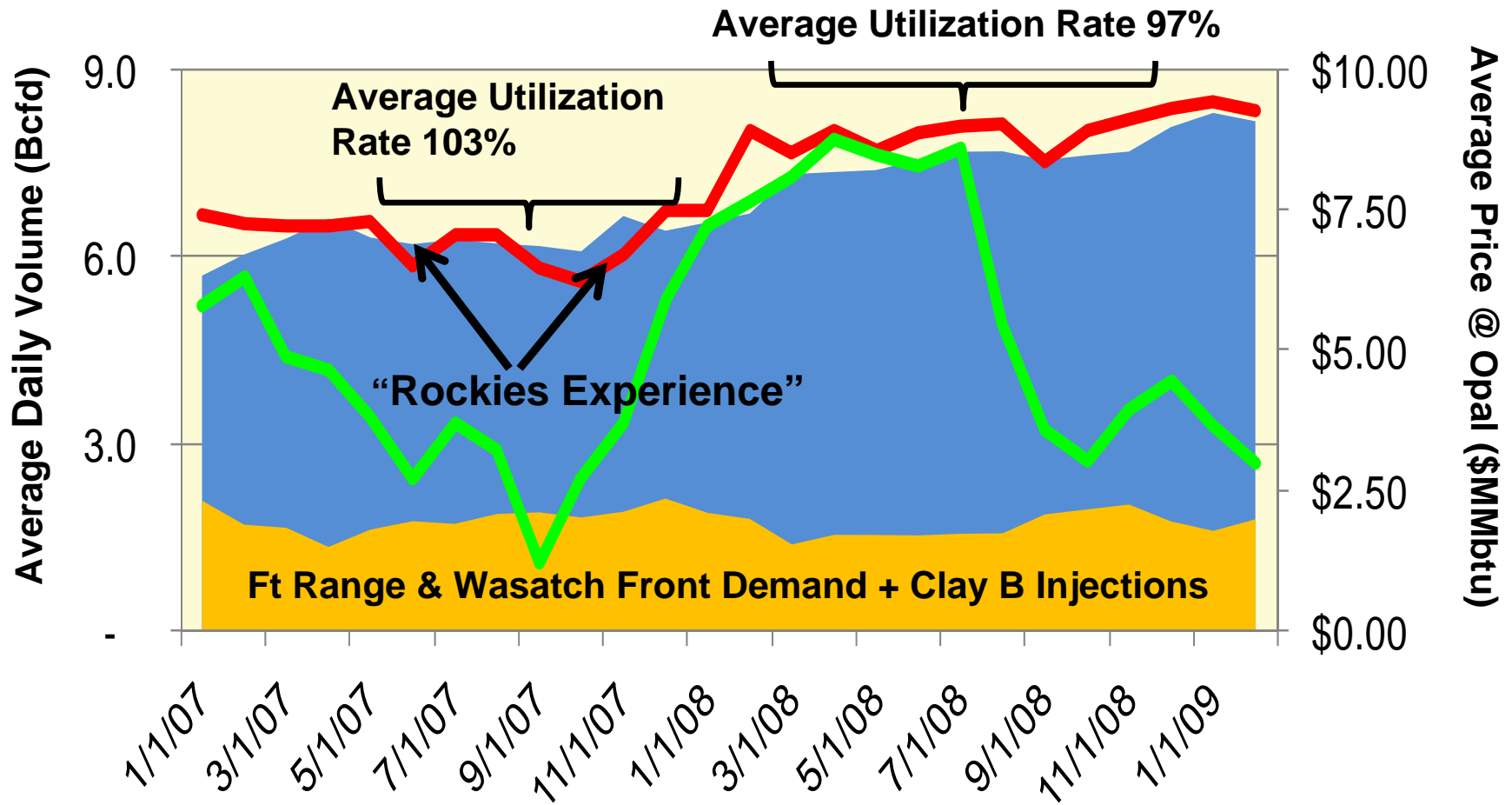
Rockies Gas Is Mostly For Export



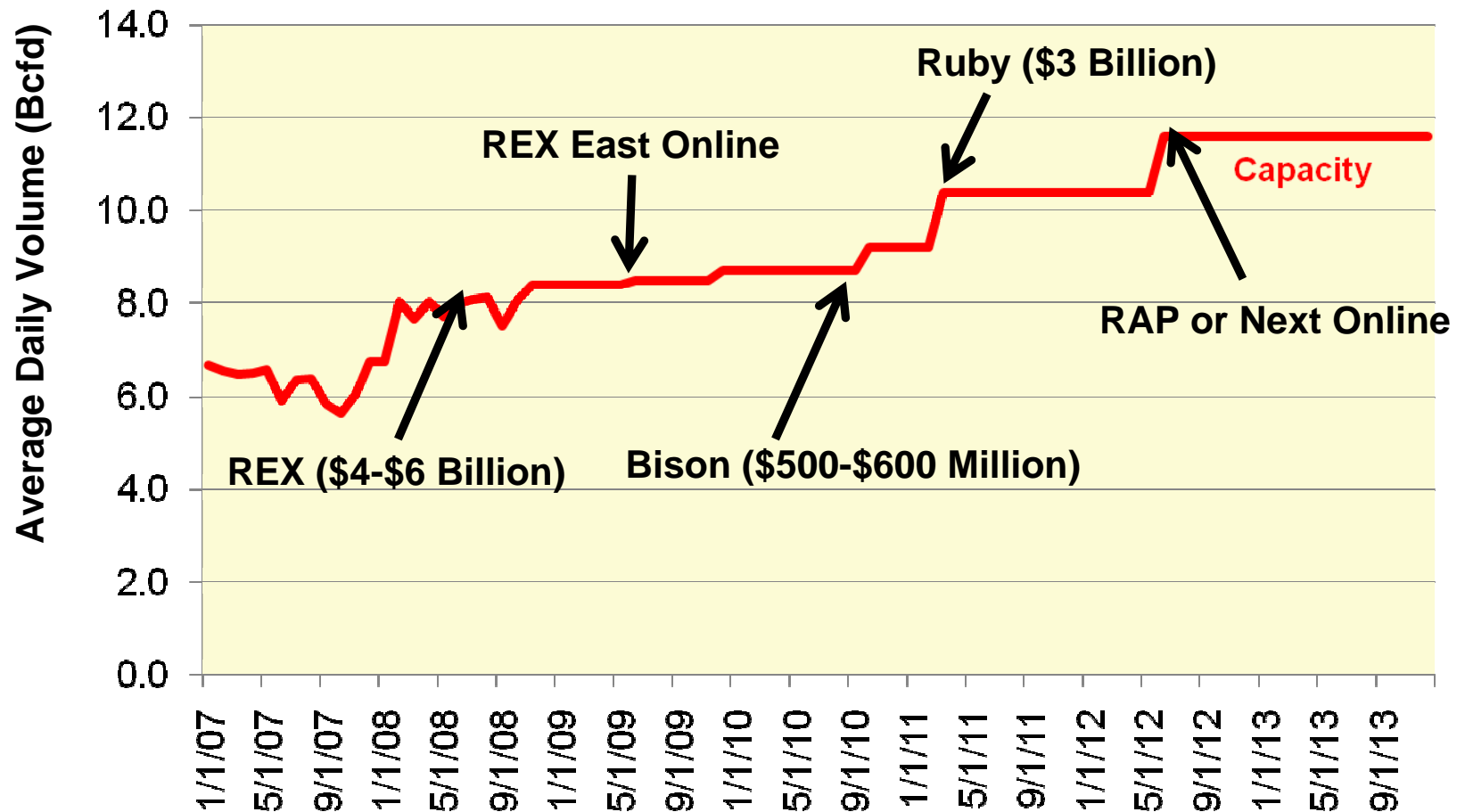
All Rockies Export Outlets Are Constrained



When Capacity Is Tight, Prices Fall

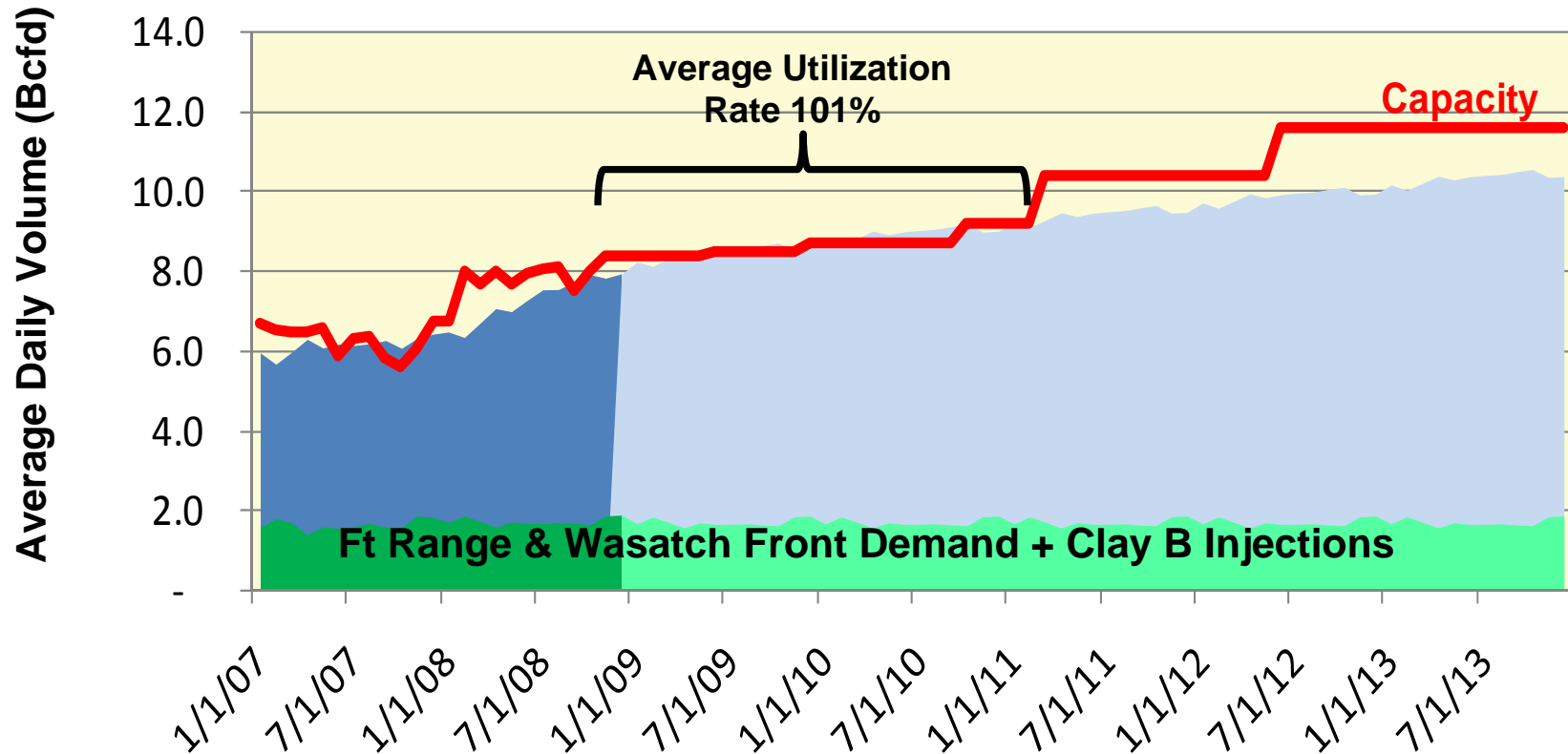


Rockies Capacity Additions



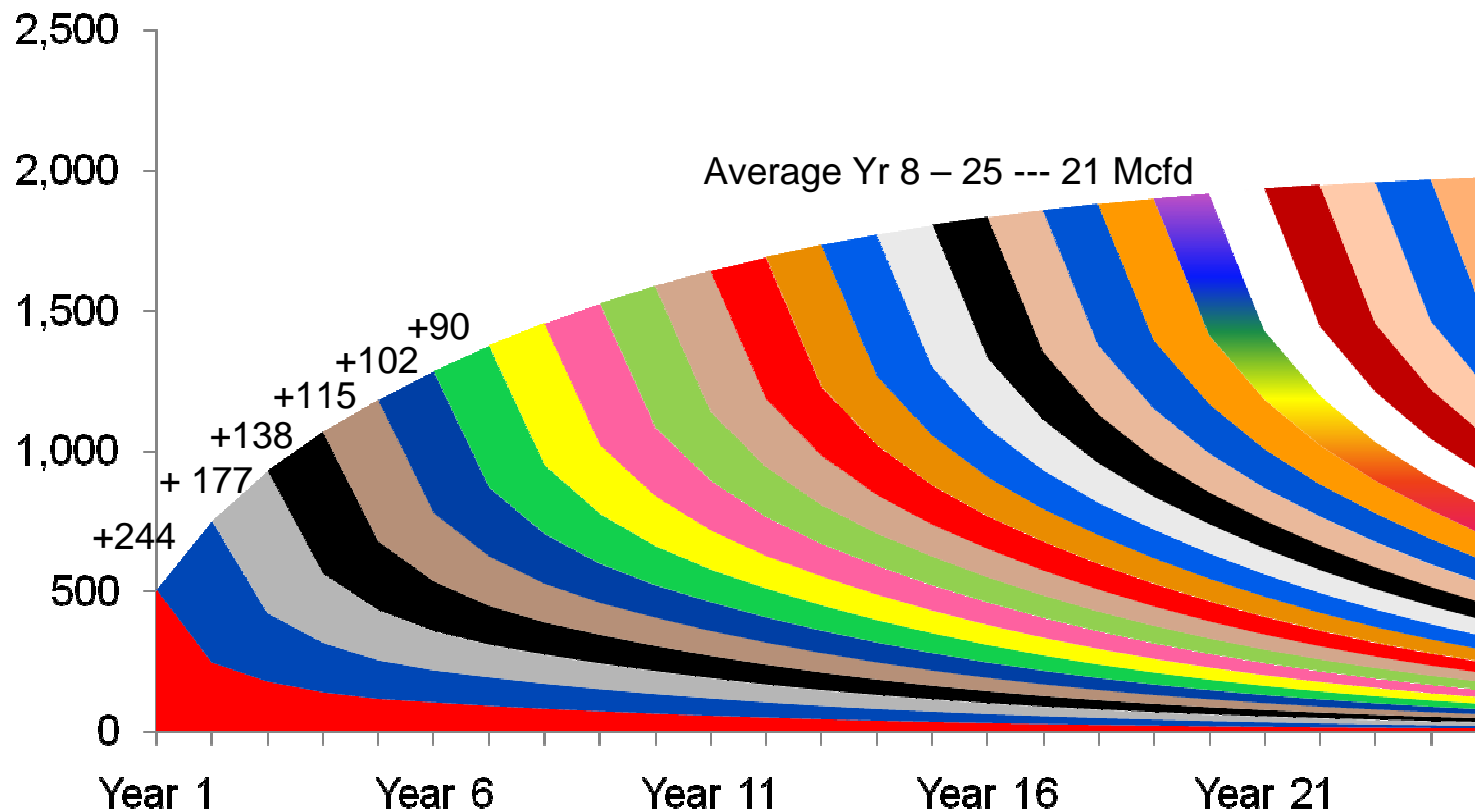
Business As Usual – Prices Too Low To Support Drilling

Assumes Drilling Remains Constant At Dec 08 Rate



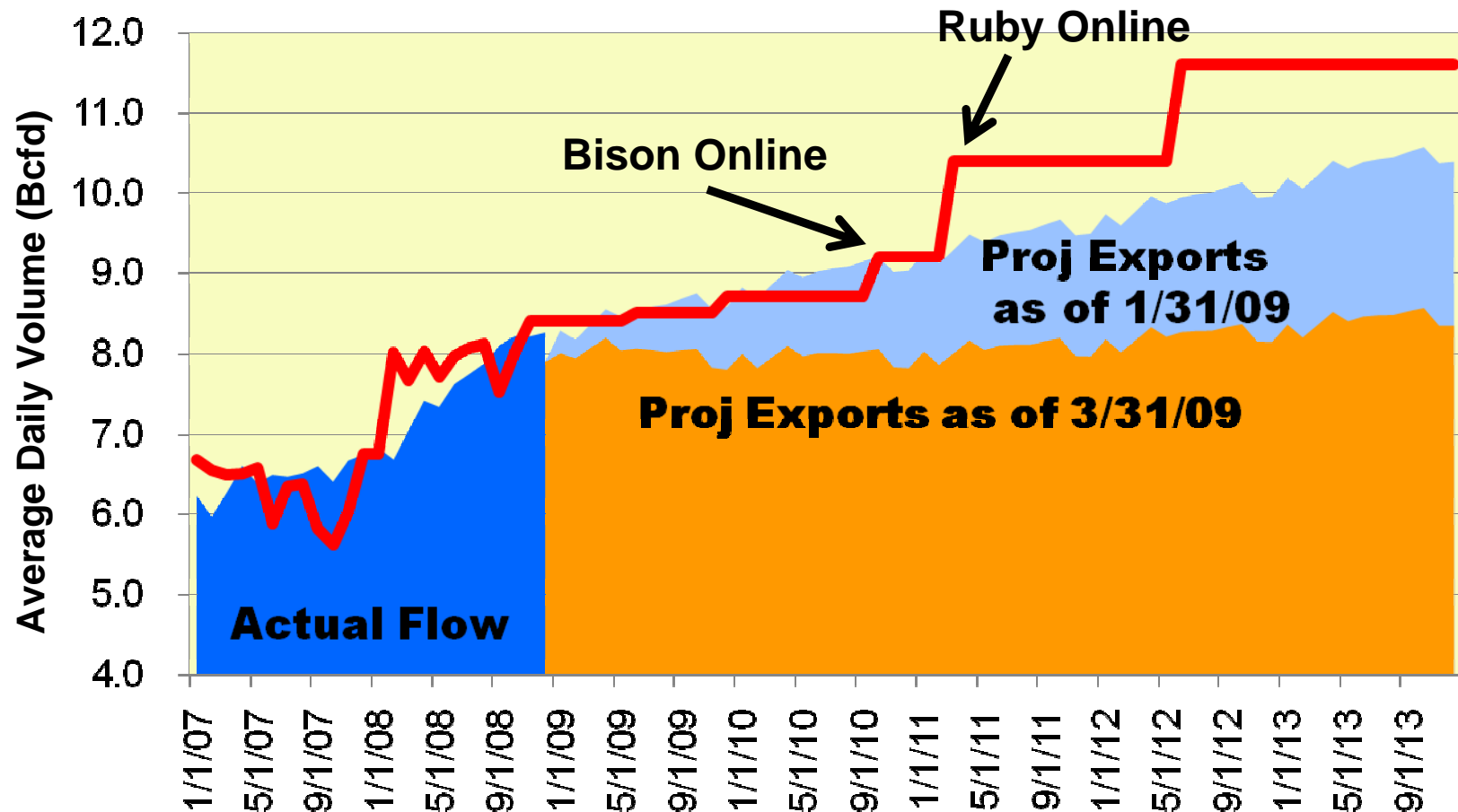
Steep Decline Rates Mean That Each Well Adds Less Incremental Volume

Average Daily Production From A Mamm Cr Well, Piceance Basin (Mcf/d)

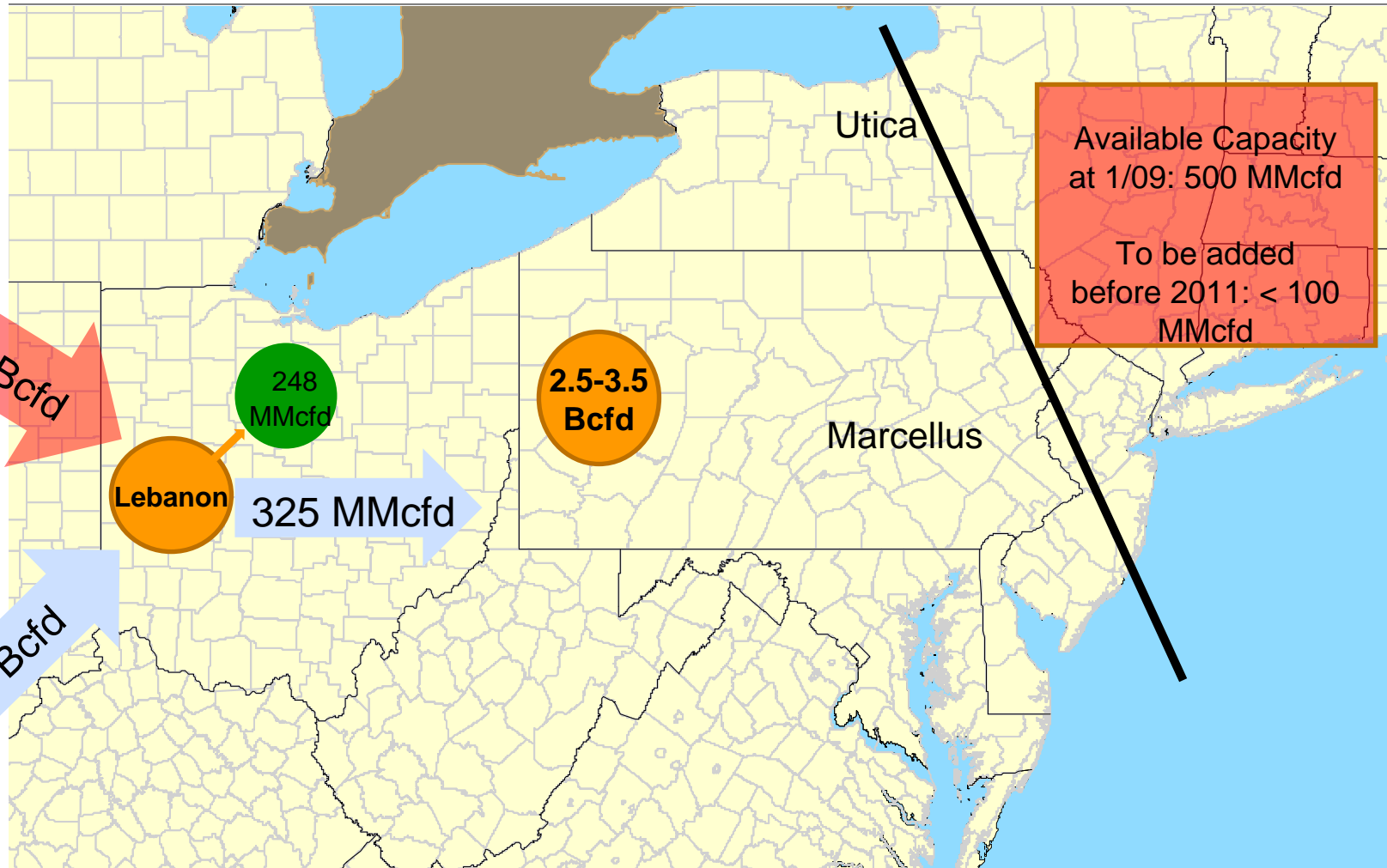


Assumes one well drilled per year

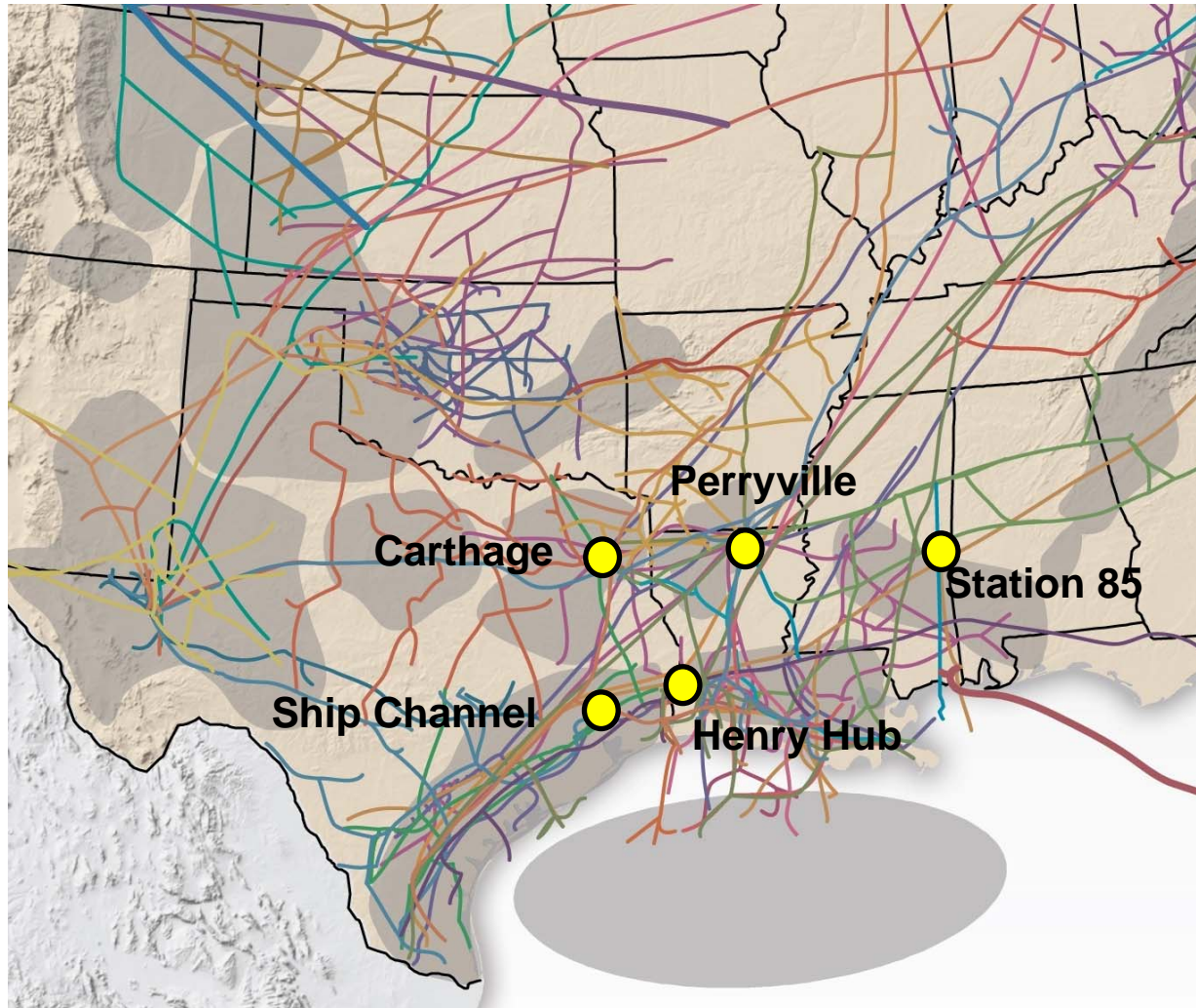
Drilling Slowdowns Are Aligning Production & Capacity



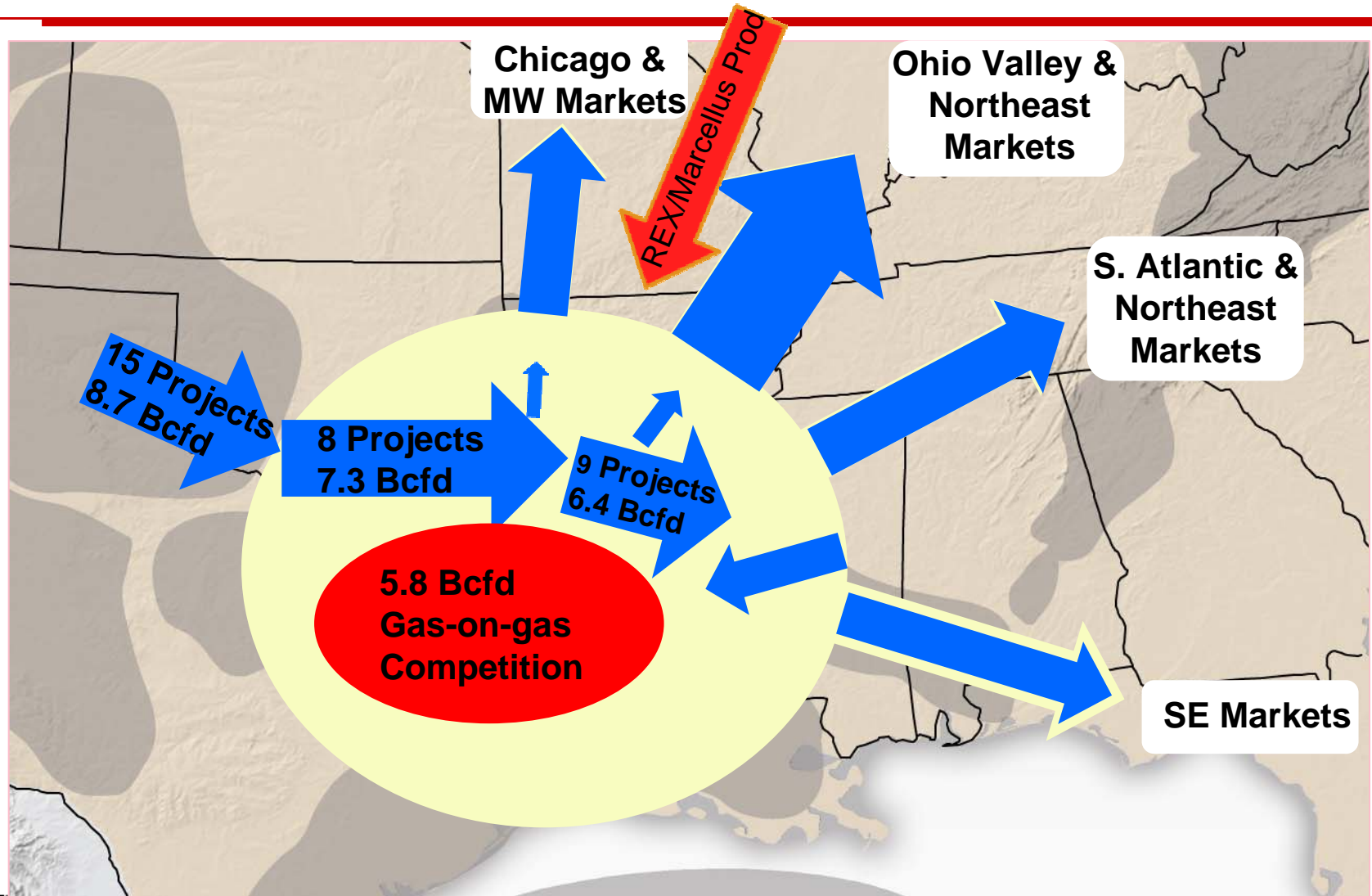
Constraints Are Developing In The Appalachia Market



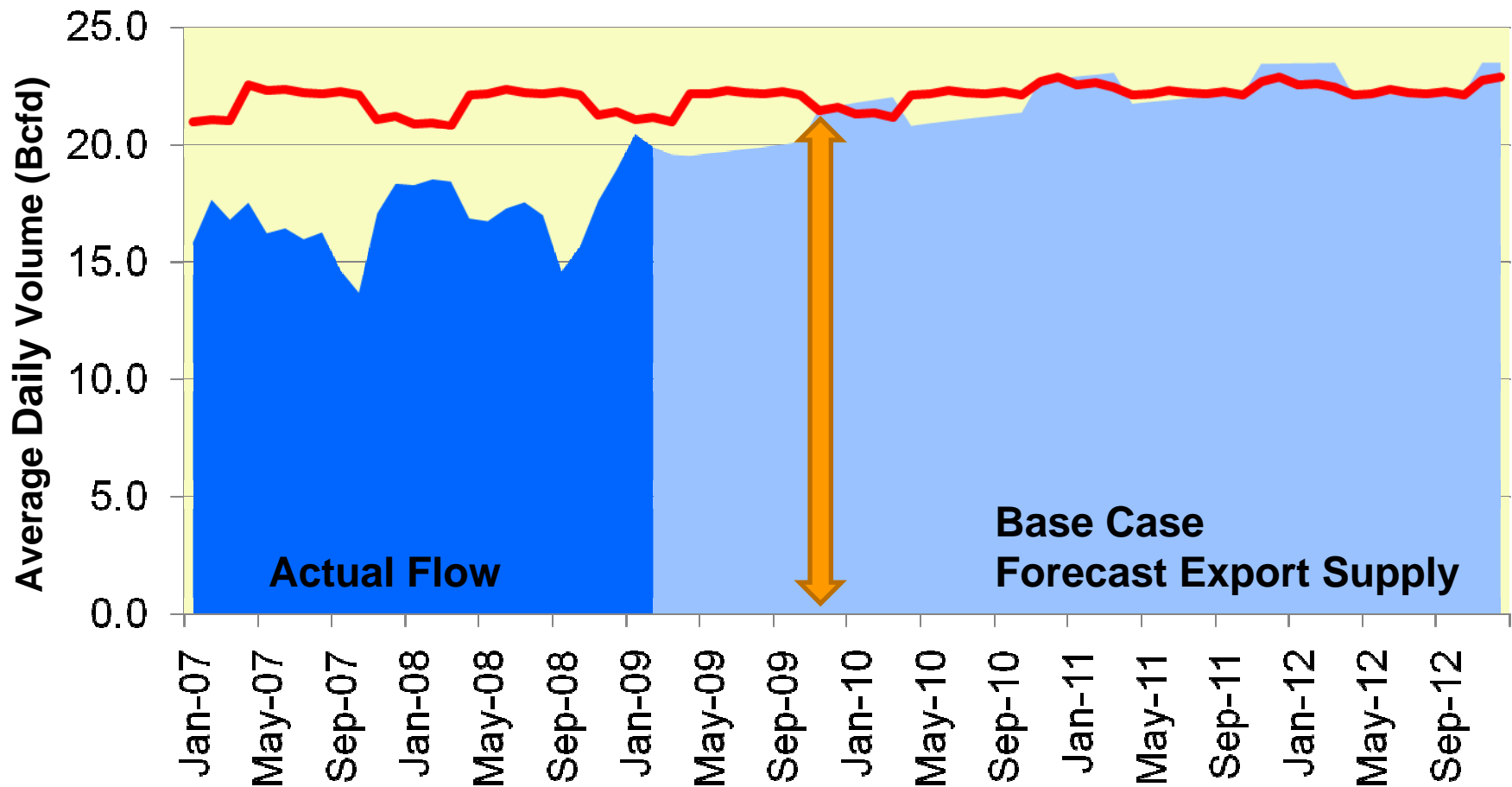
The Southeast Supply Area Is Complex



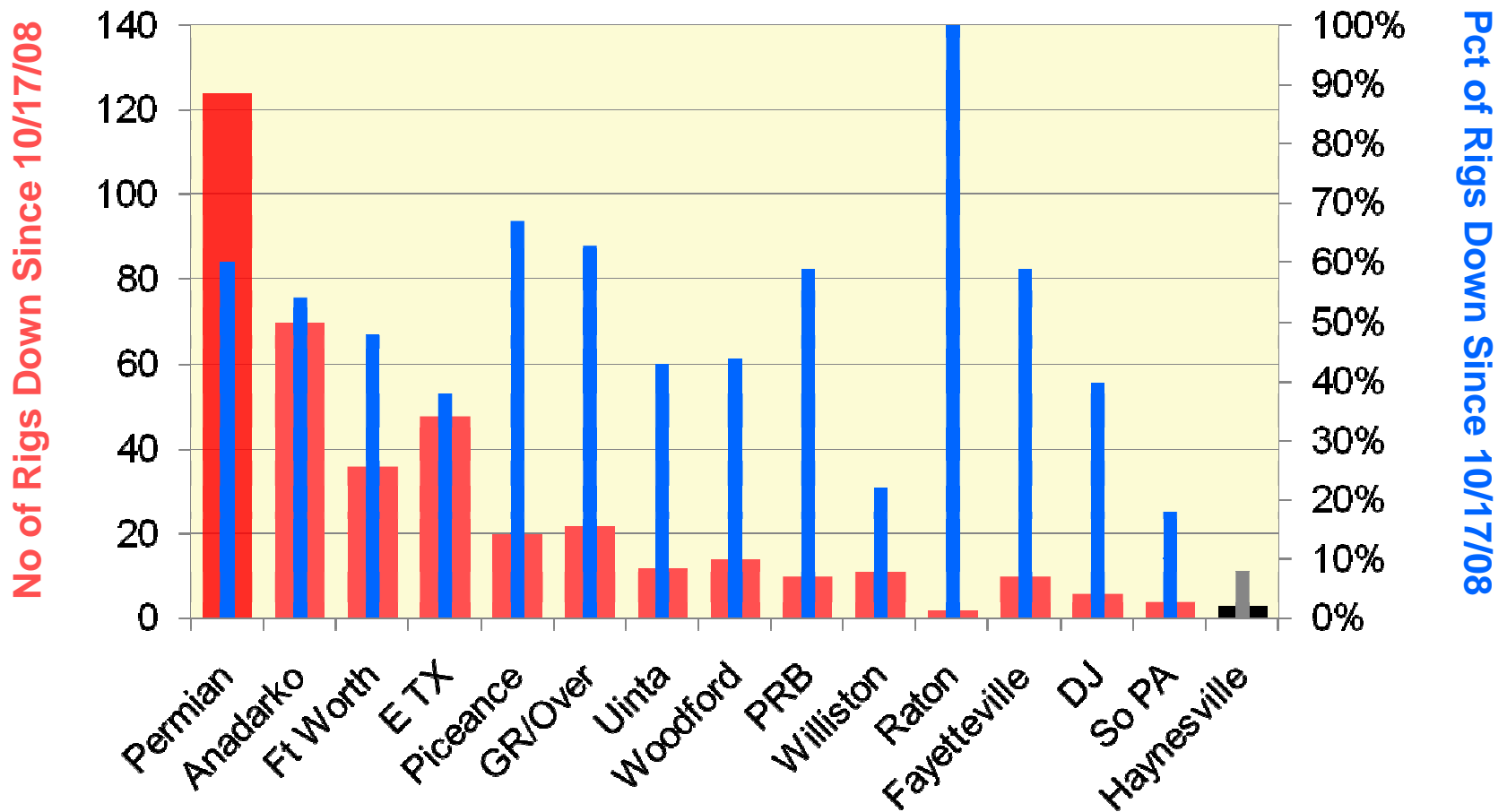
Pipeline Constraints Will Impact The SE Supply Area As Well



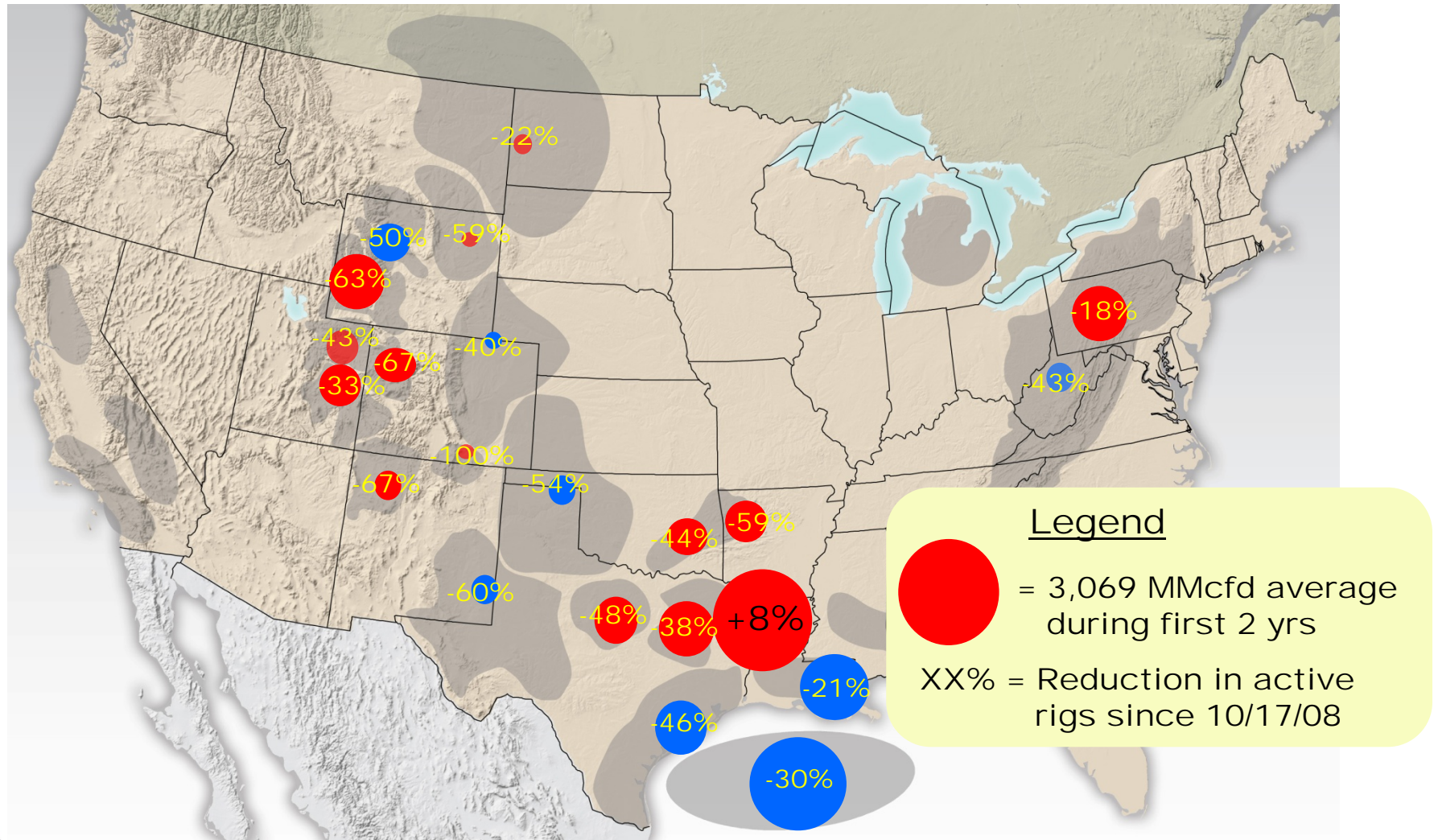
Drilling May Fall Off Further In The SESA As Well



Drilling Is Off Across The Country



Exploration Is Concentrating In The Most Productive Basins



Conclusions

- ❖ **Natural gas is the GOOD energy news for consumers.**
- ❖ **2008 belied the notion that the US is running out of natural gas. Prices will continue to fall and may stay in the \$3 to \$6 range for many years.**
- ❖ **On our current pace:**
 - **Exploration activity will fall dramatically in 2009 from 2008 levels.**
 - **2009 drilling declines will arrest production growth.**
 - **Because of technology and pipeline constraints, prices will continue to be volatile, but corrections will happen more quickly and the range narrower.**
 - **Additional pipe capacity is needed but increased demand must come first .**

Implications

- ❖ **The low cost of natural gas will make alternatives economically less competitive .**
- ❖ **We are faced with an historic opportunity: US gas supplies are sufficient to play the central role in our nation's energy policy:**
 - **It is abundant in the US**
 - **It is relatively cheap**
 - **It is relatively clean**
 - **It is N. American – it provides jobs and tax base**
 - **Its consumption technologies are proven**
- ❖ **State, local and federal government policy is critical to realizing this fragile opportunity.**
- ❖ **Government policy – whether state, federal or local – needs a feedback loop to accommodate market changes. Ultimately markets prevail.**

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