

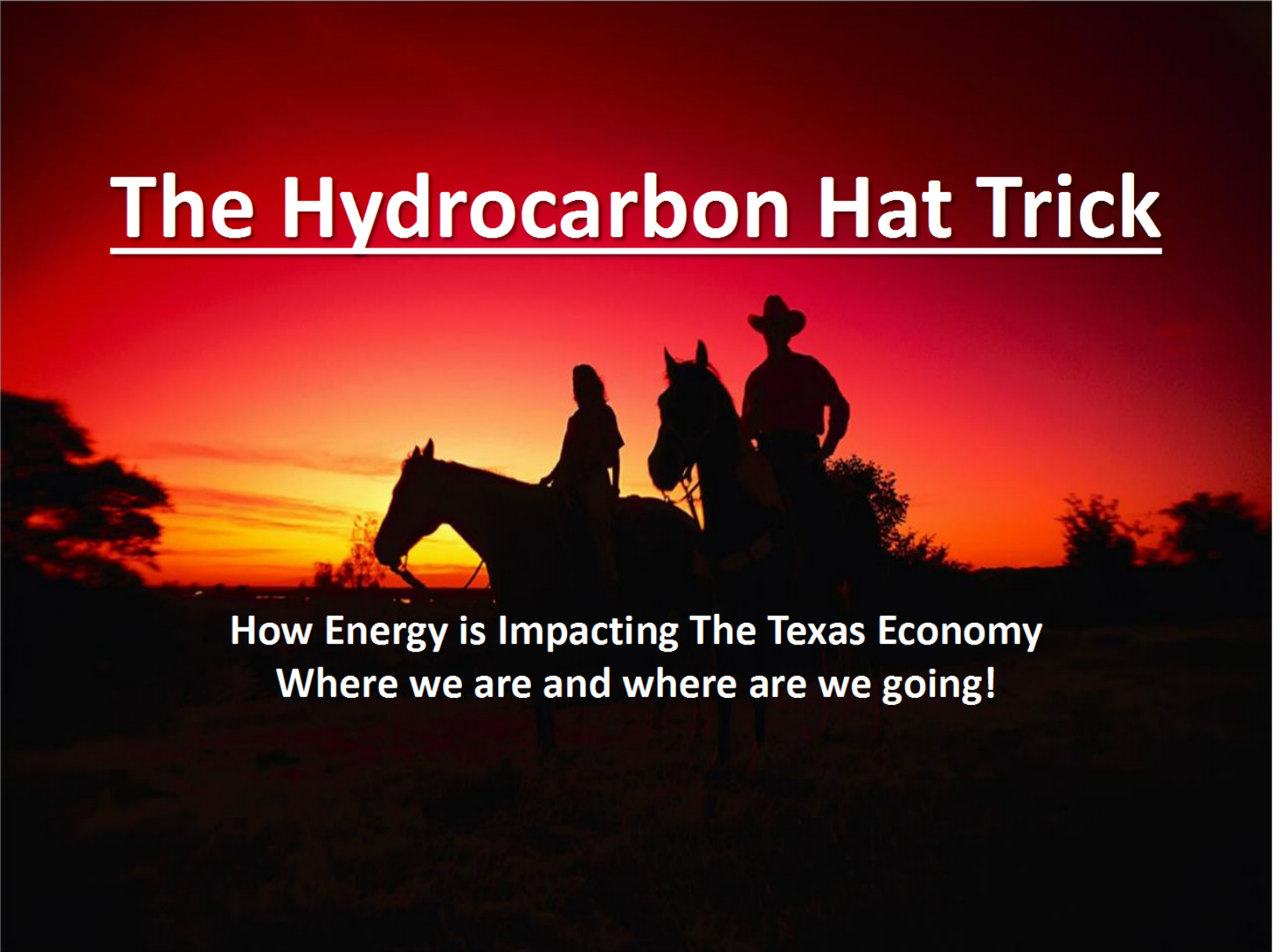
PERMIAN BASIN COALITION

PARTNERSHIP - PRODUCTION - PROGRESS



D. Kirk Edwards
Las Colinas Energy Partners, LLC
April 2, 2013
Midland, Texas

The Hydrocarbon Hat Trick

The background of the slide is a photograph showing the silhouettes of two people riding horses against a vibrant sunset sky. The sky transitions from a bright orange near the horizon to a deep red at the top. The riders are positioned in the center of the frame, with the sun setting behind them, creating a strong backlight effect. The overall mood is serene and evokes a sense of traditional Texas life.

**How Energy is Impacting The Texas Economy
Where we are and where are we going!**

A satellite image of Texas, showing the state's outline and major cities. The image is dark, with the landmass appearing as a lighter, textured shape against a black background. Four cities are labeled in red text: Midland/Odessa, Austin, San Antonio, and Houston. The labels are positioned over their respective geographic locations on the map.

Midland/Odessa

Austin

San Antonio

Houston



Midland/Odessa

Austin

San Antonio

Eagle Ford Shale

The Hydrocarbon Hat Trick

Extraction



Refining



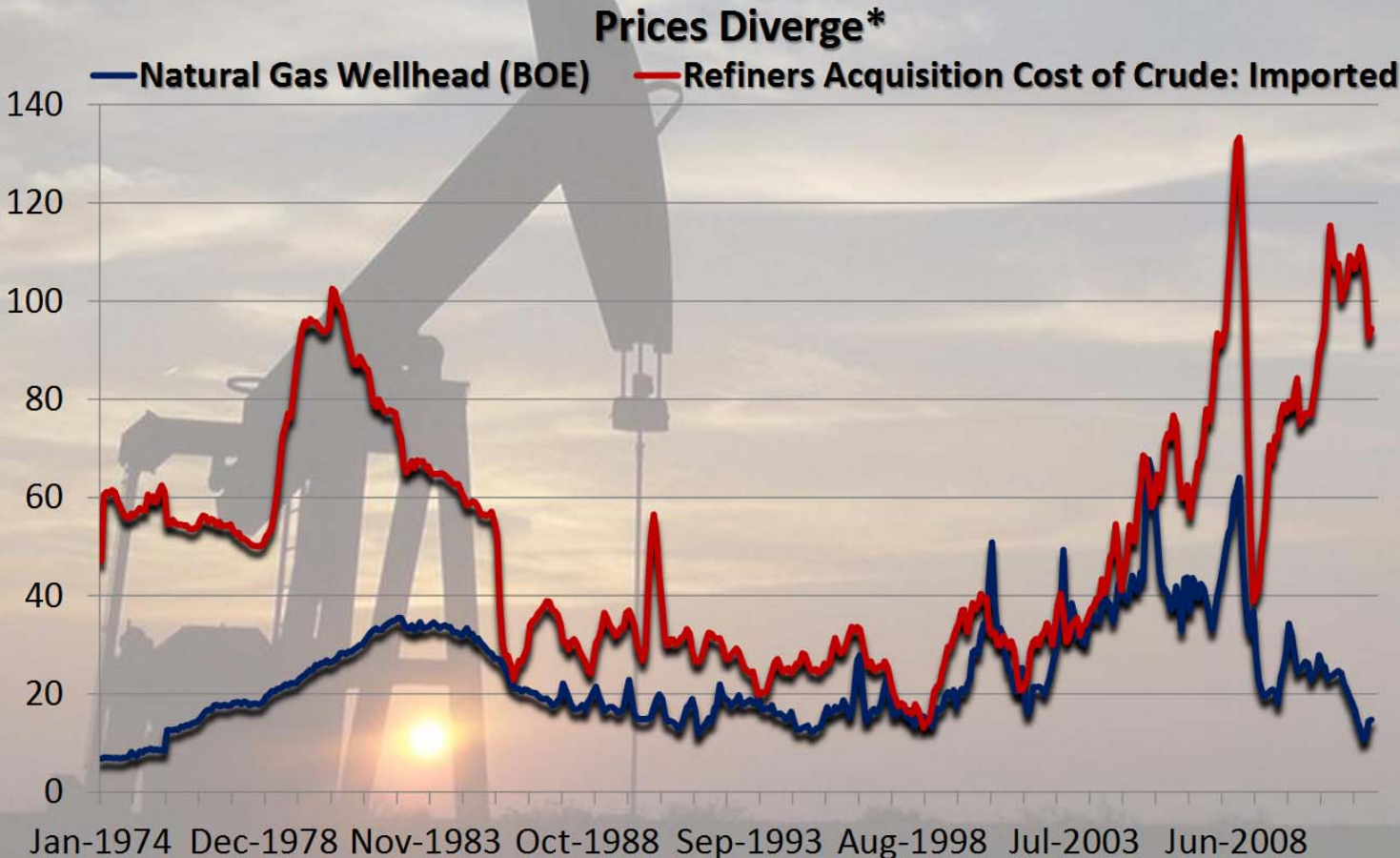
Petrochemicals



Oil & Gas Extraction



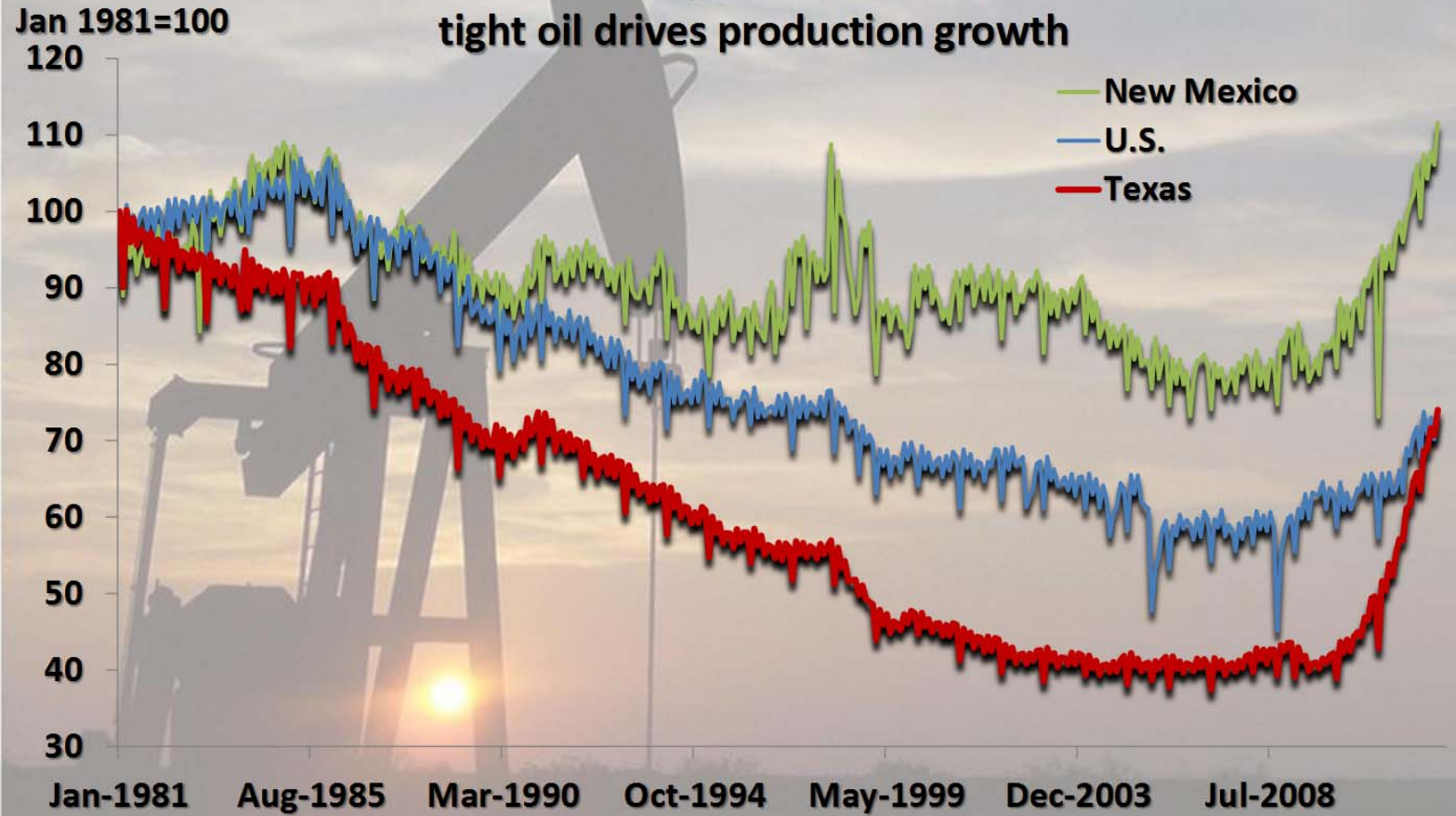
Oil & Gas Extraction



* Adjusted using consumer price index: all urban consumers.
SOURCE: Energy Information Administration. Author's adjustments.

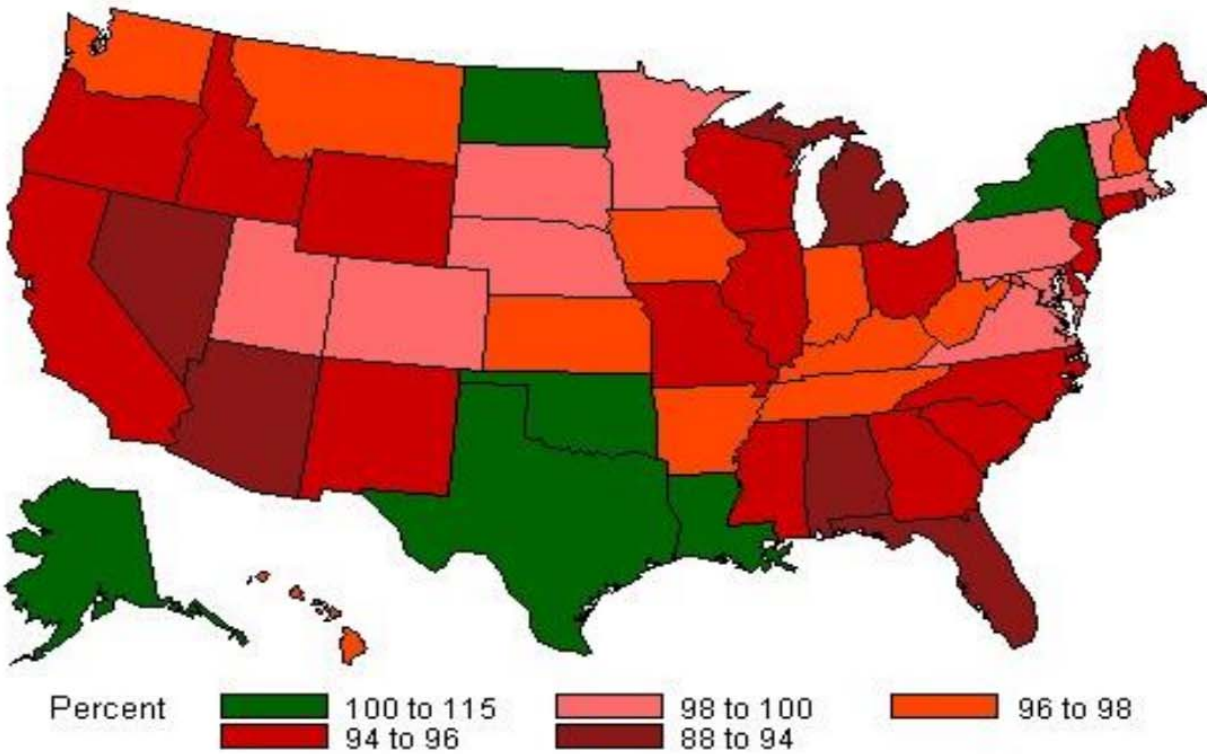
U.S. Oil Production Growth

After 30 years of decline,
tight oil drives production growth



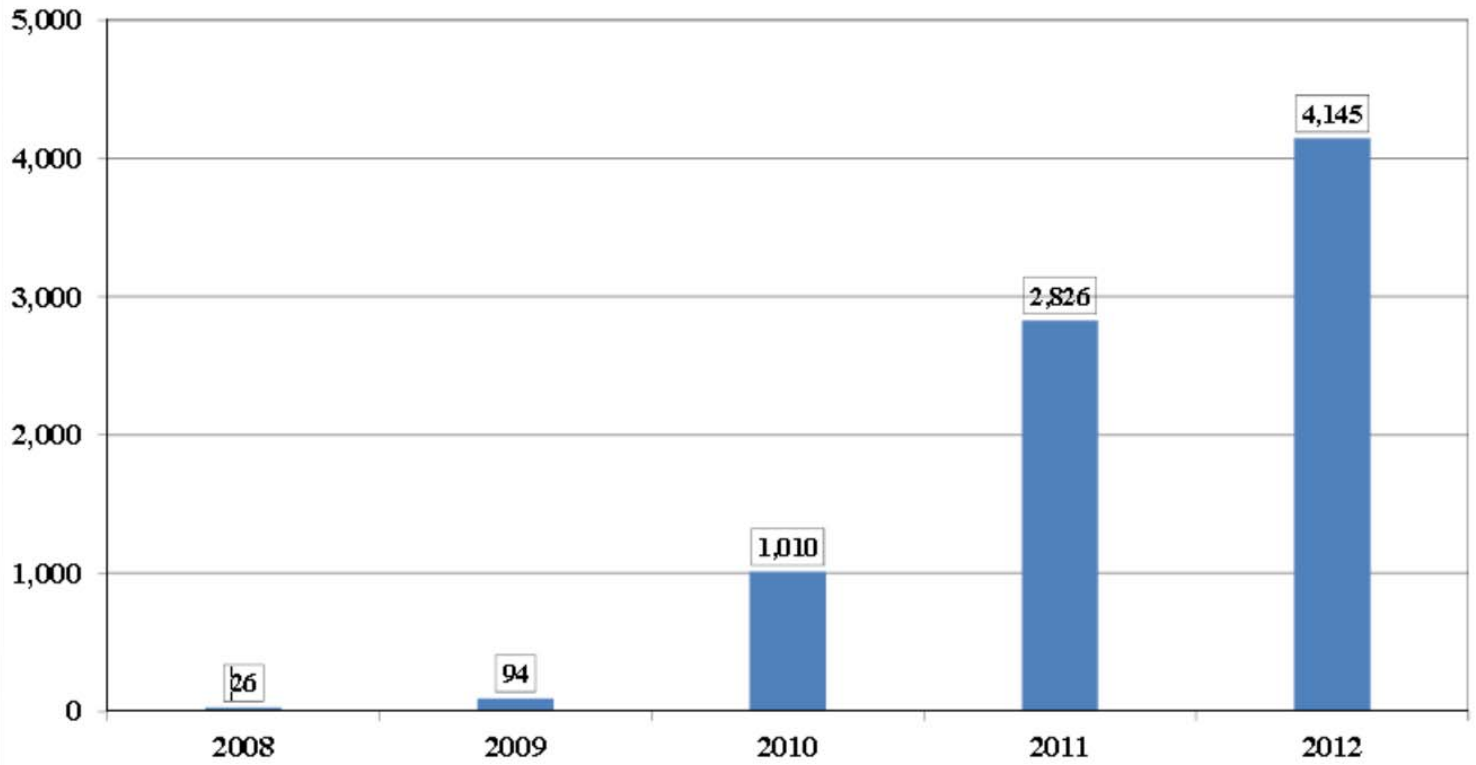
SOURCE: Energy Information Agency.

Most States Below Peak Employment



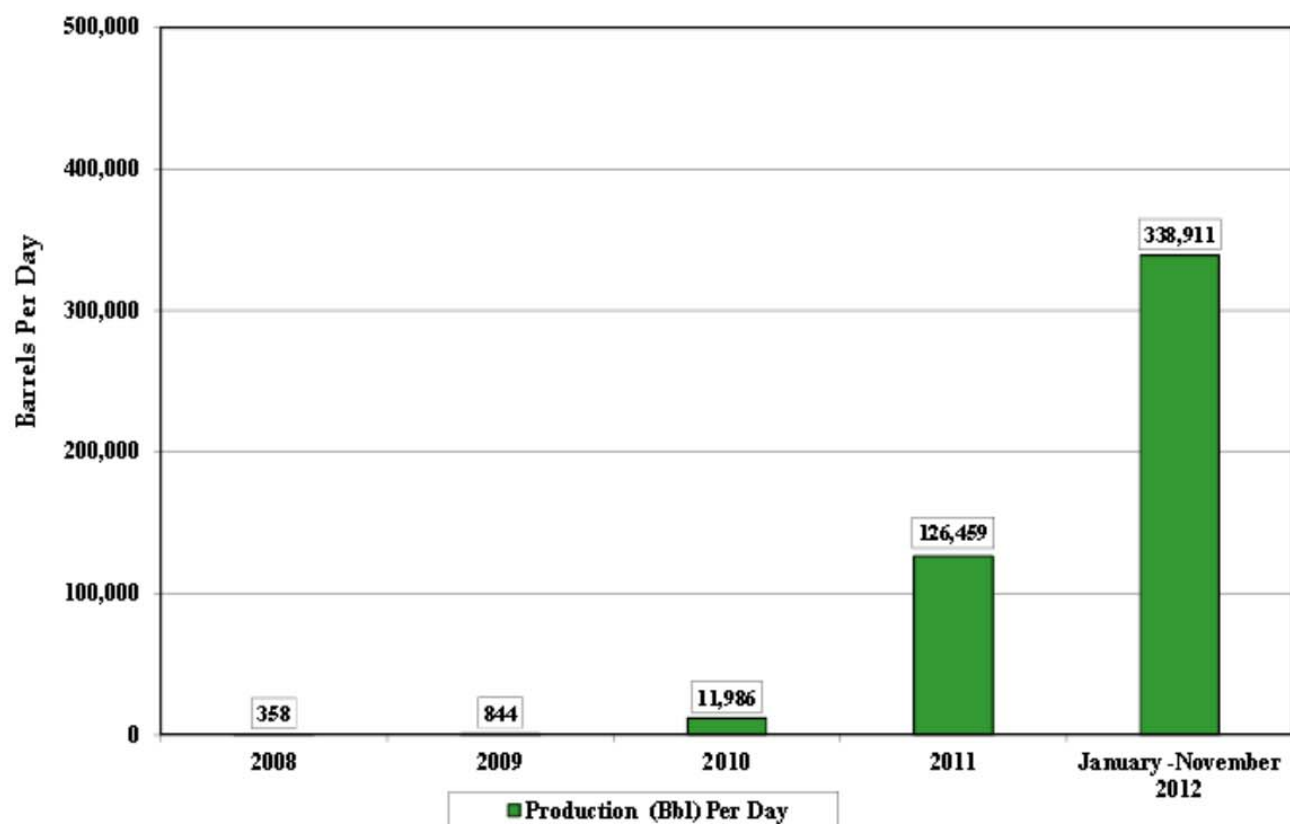
EF shale production growing rapidly

Texas Eagle Ford Shale
Drilling Permits Issued
2008 through 2012



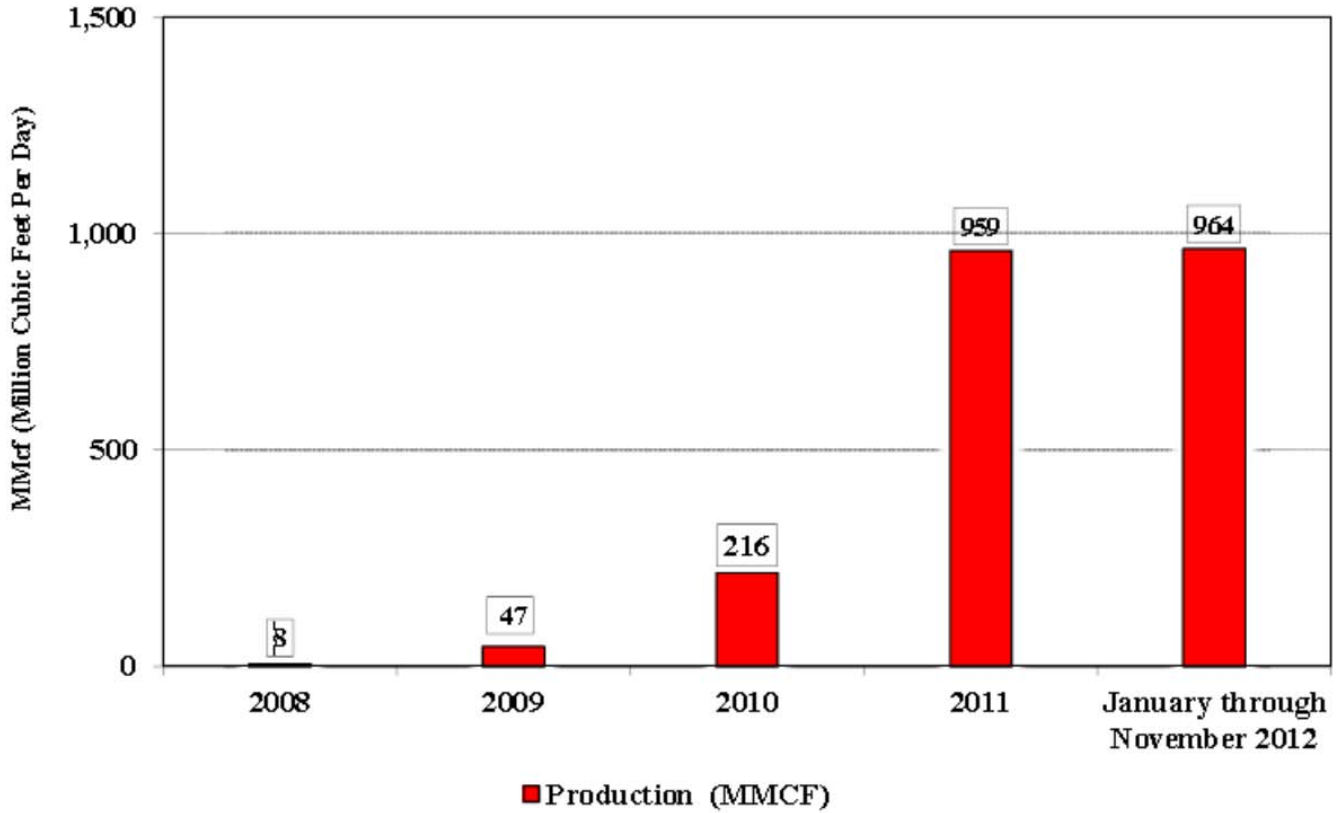
EF shale production growing rapidly

Texas Eagle Ford Shale
Oil Production
2008 through November 2012



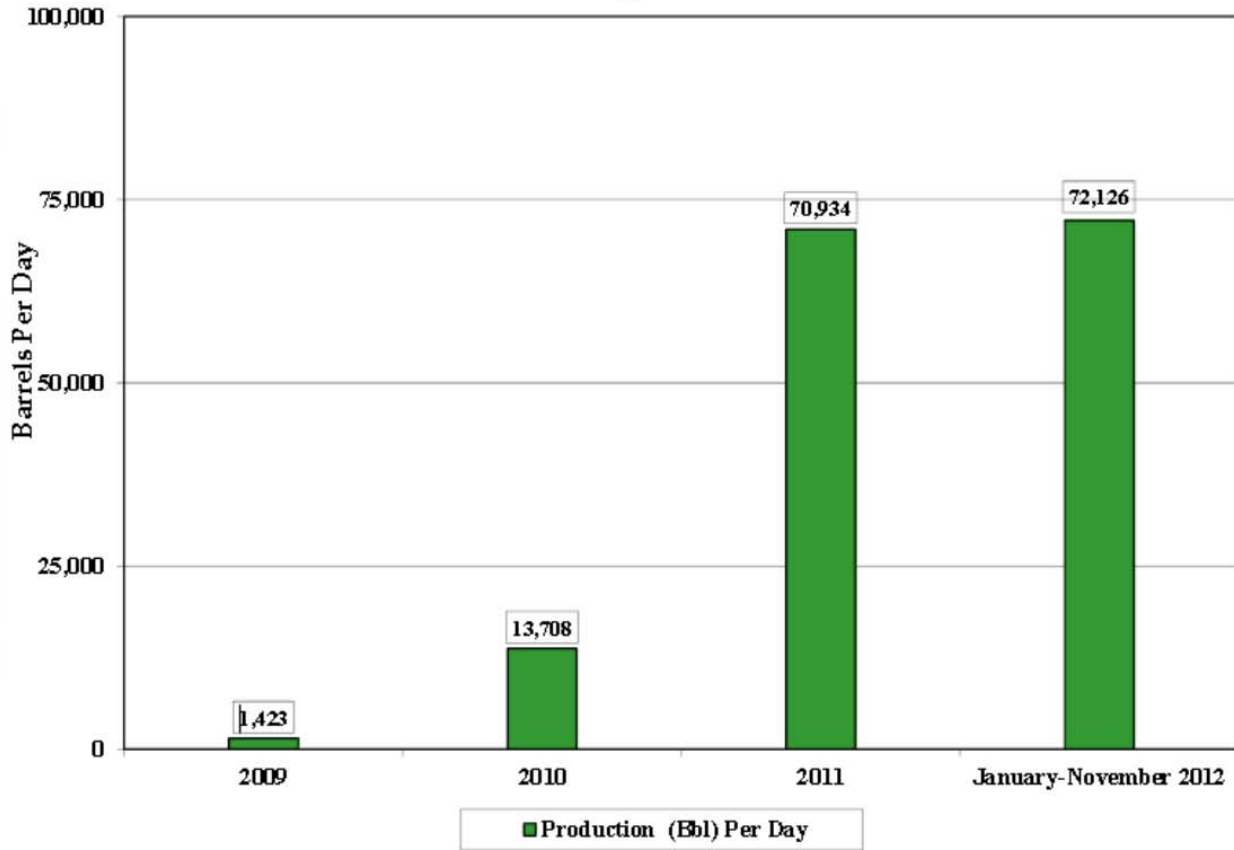
EF shale production growing rapidly

Texas Eagle Ford Shale
Gas Well Gas Production
2008 through November 2012



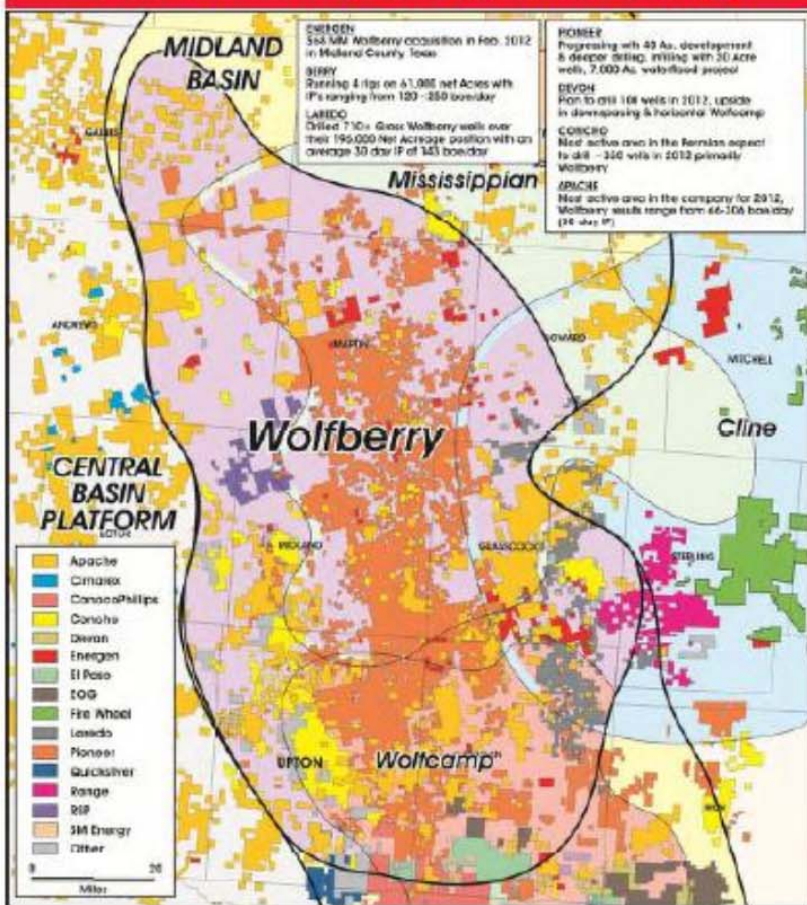
EF shale production growing rapidly

Texas Eagle Ford Shale
Condensate Production
2009 through November 2012

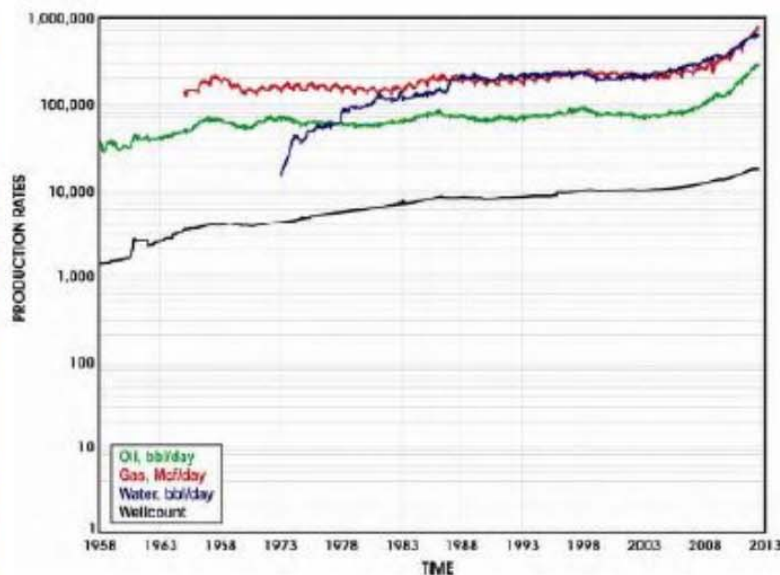


Midland Basin Activity – Wolfberry – Acreage Positions and Operator Activity

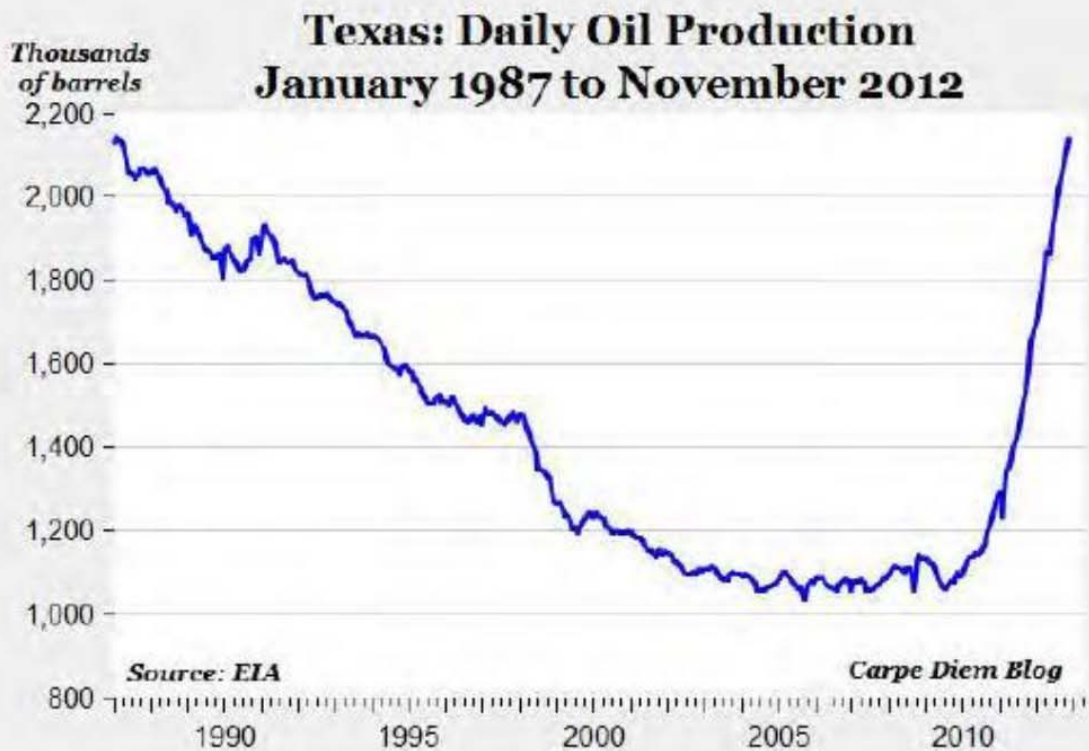
Select Wolfberry Acreage with Activity



Spraberry-Wolfberry Historical Production



- \$2 Mln well cost with 140 Mboe EUR
- Vertical wells with multi stage fracs
- 40 acre spacing being reduced to 20
- Deeper zones may add 100 Mboe to EUR
- Waterflood pilots having positive results



Shale Boosts State Tax Revenues

Production & Regulation Tax Revenues:

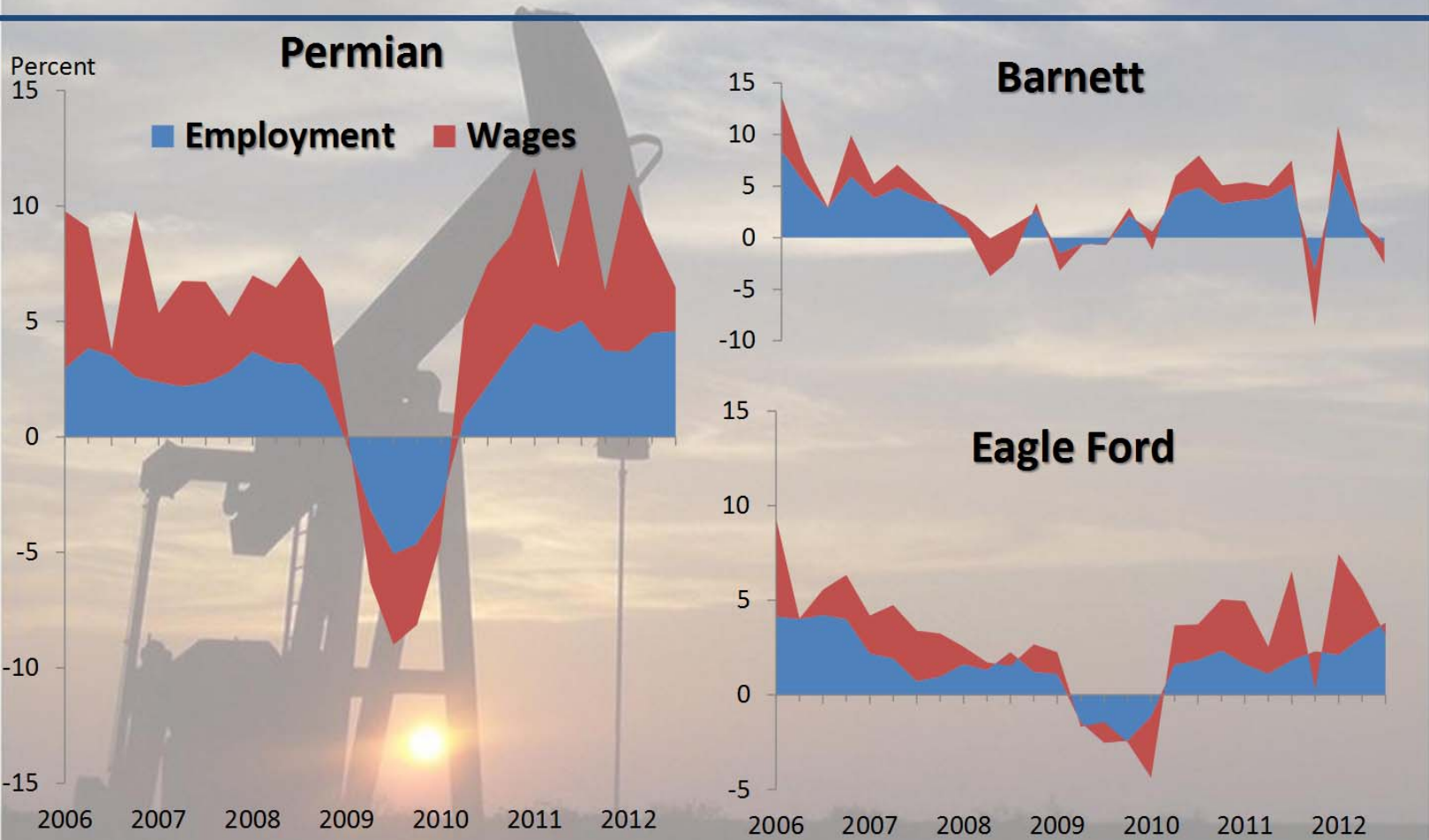
- Natural Gas up **53%** in 2011 & **38%** in 2012
- Oil up **46%** in 2011 and **43%** in 2012
 - Oil Well Service Taxes up 54%
 - Over a dozen other mining related licenses and fees saw well into double digit increases in net revenues, as did Royalty Payments

Retail sales in energy regions

- Midland & Odessa Sales Tax up 15-18% ytd in 2013.

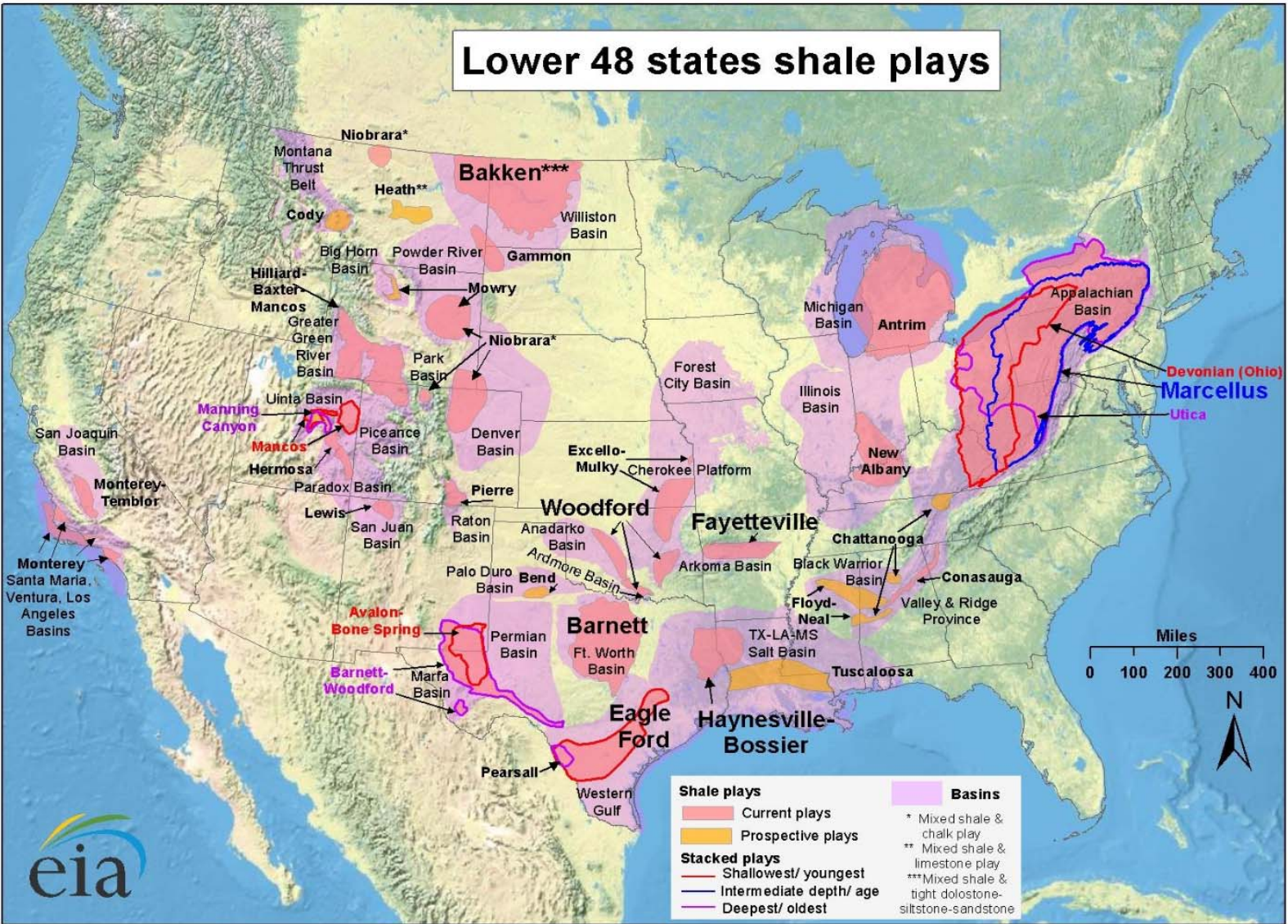
UTSA: 2011 EF generated \$312 million in state taxes

Total Wages In Texas Shale*

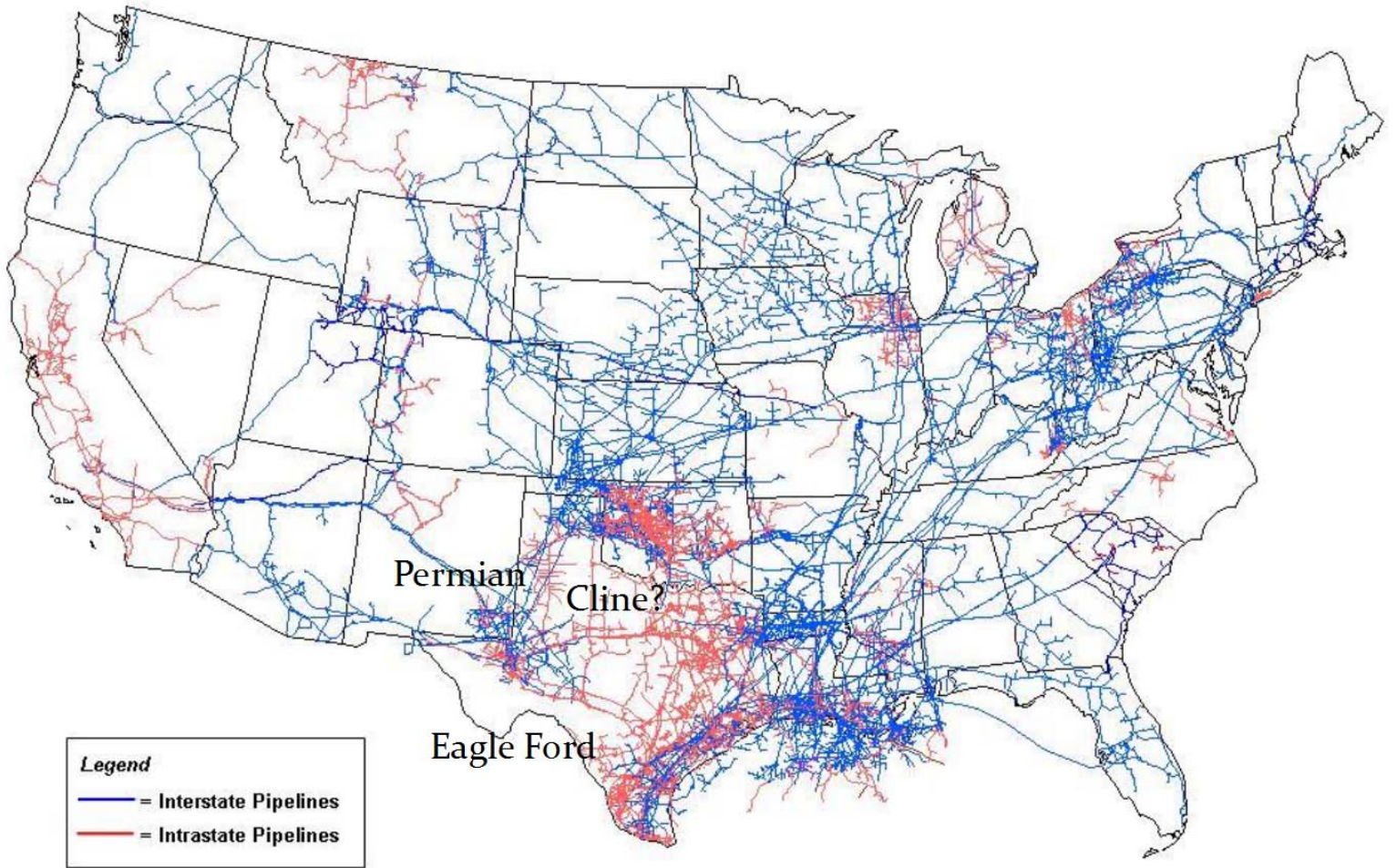


*Growth rates are year-to-year. Adjusted using U.S. Personal Consumption Expenditures.
SOURCE: Quarterly Census of Wages and Employment; Bureau of Labor Statistics

Lower 48 states shale plays



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



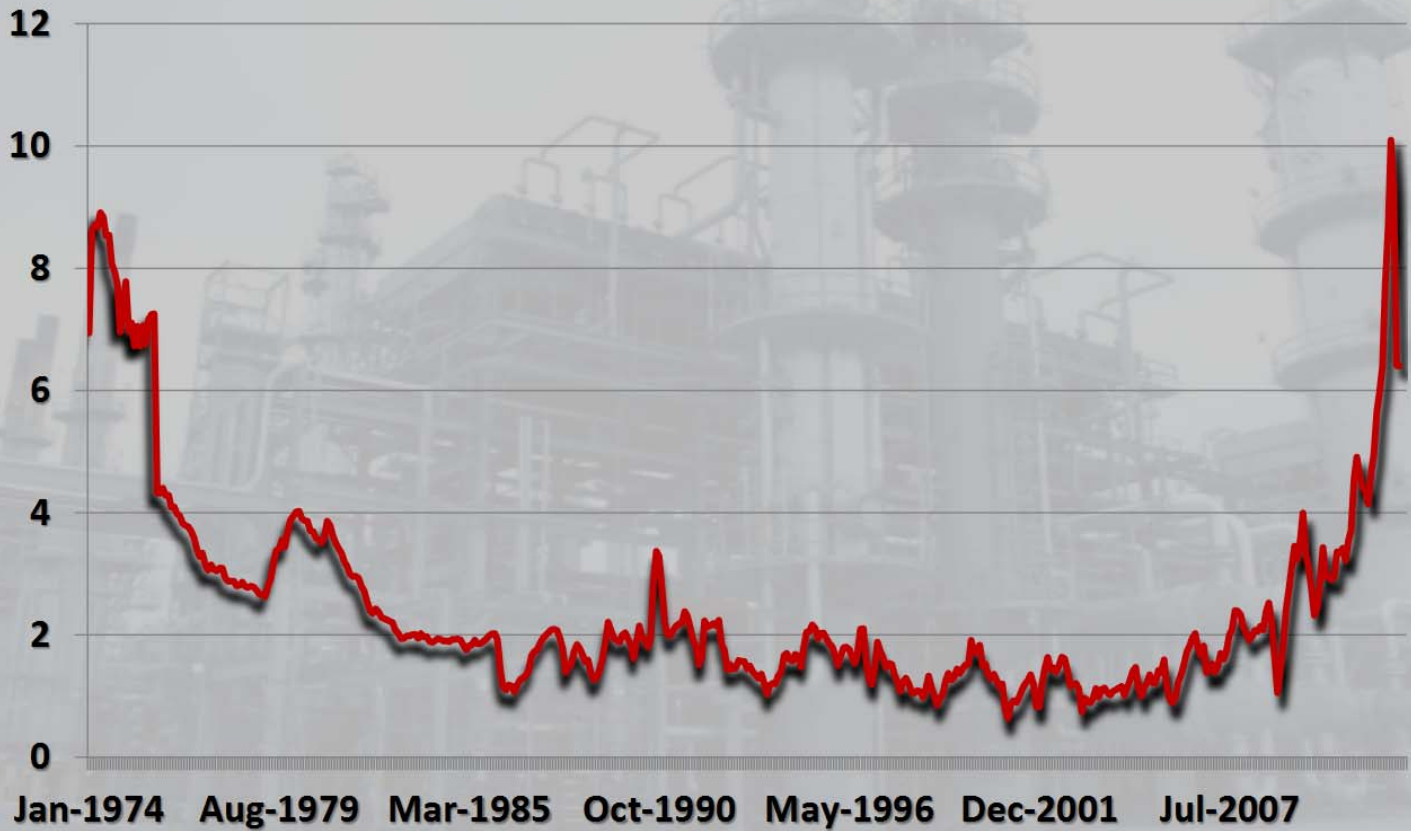
Source: Energy Information Administration, Office of Oil & Gas, Natural Gas Division, Gas Transportation Information System

Refining & Petrochemicals



Refining & Petrochemicals

Oil rises while shale and weather crush natural gas

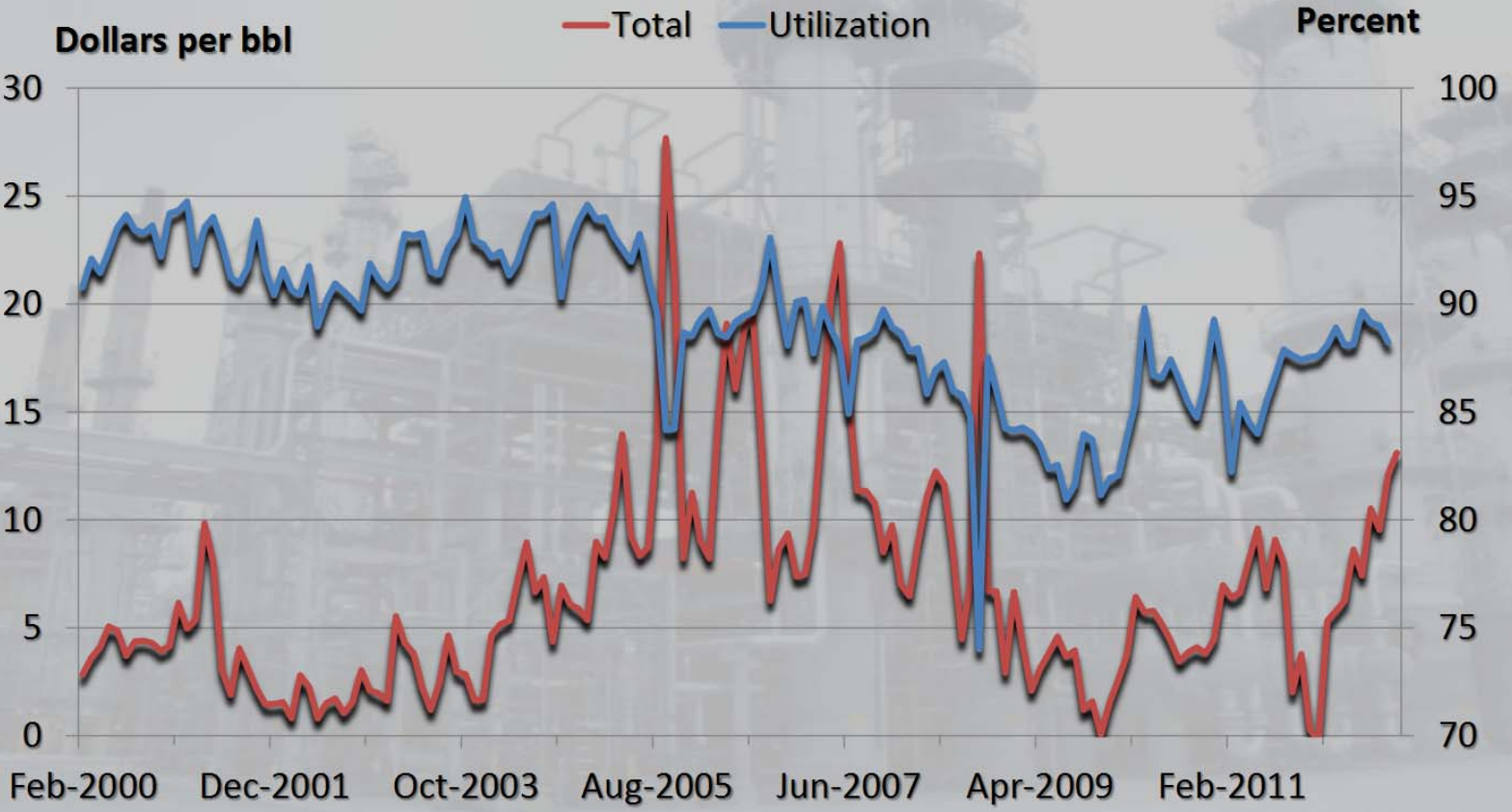


*Refiners acquisition cost of imported crude / natural gas wellhead price (BOE).

SOURCE: Energy Information Administration. Author's Adjustments.

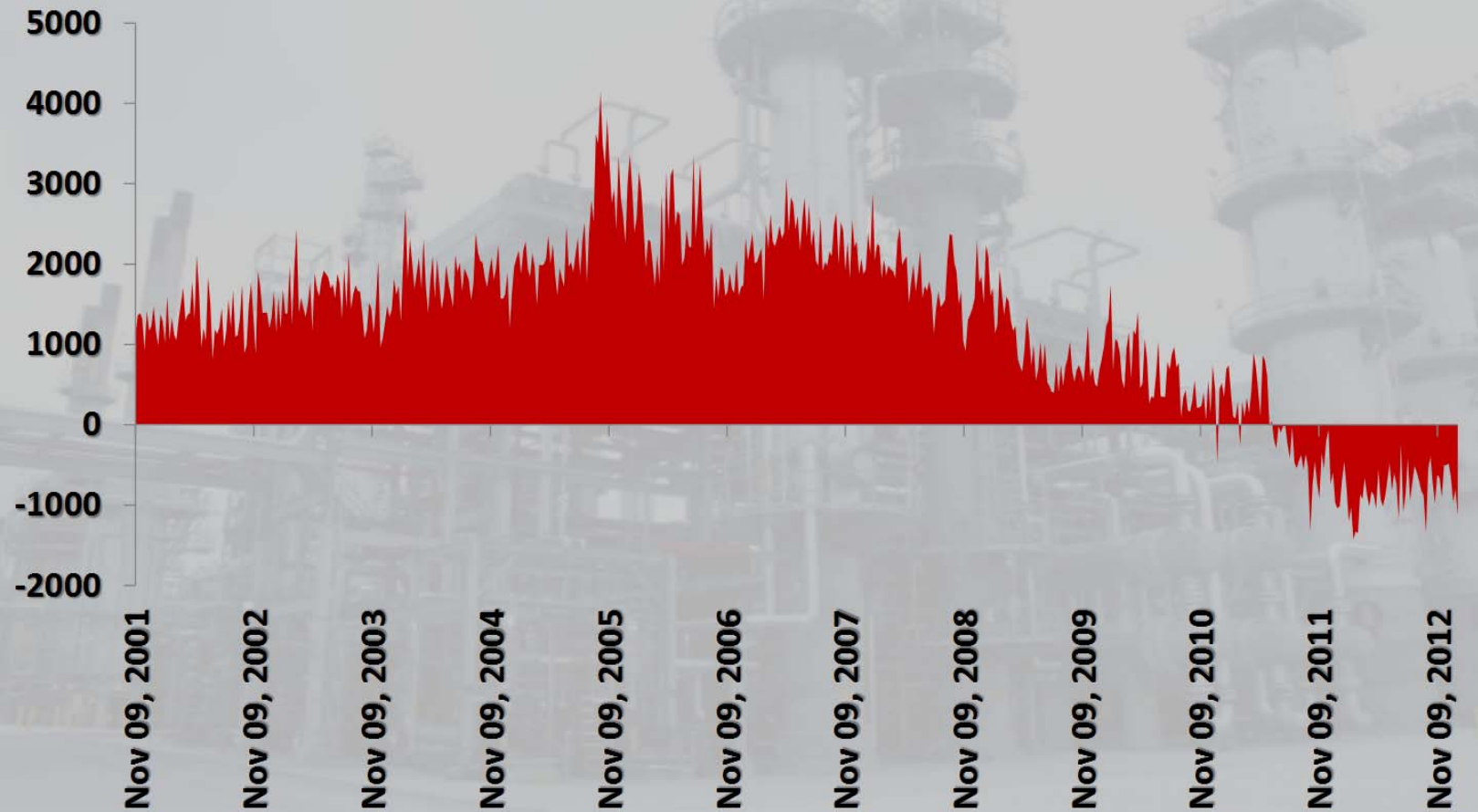
Refining

Utilization and margins are up



Refining

the U.S. becomes a net exporter of gasoline and diesel



Advantage U.S. Ethylene

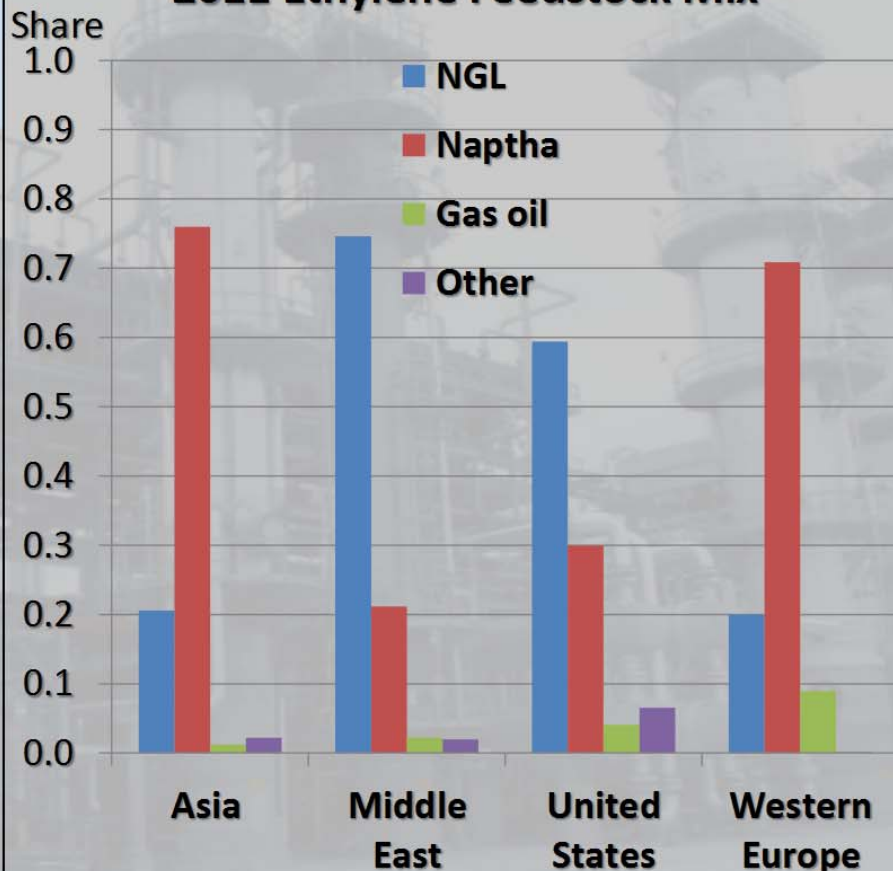
2011 Nameplate Capacity tonnes/year

Asia	29,242,000
Middle East	24,059,000
United States	27,593,206
Western Europe	24,384,000

* Percent of capacity reporting feedstock usage for each region was: Asia-82%, ME-46%, U.S.-99%, WE-89%, ROW-56%. 73% of global capacity reported feedstock use.

SOURCE: 2012 International Survey of Ethylene Steam Crackers. Author's calculations.

2011 Ethylene Feedstock Mix*



New Ethylene Capacity

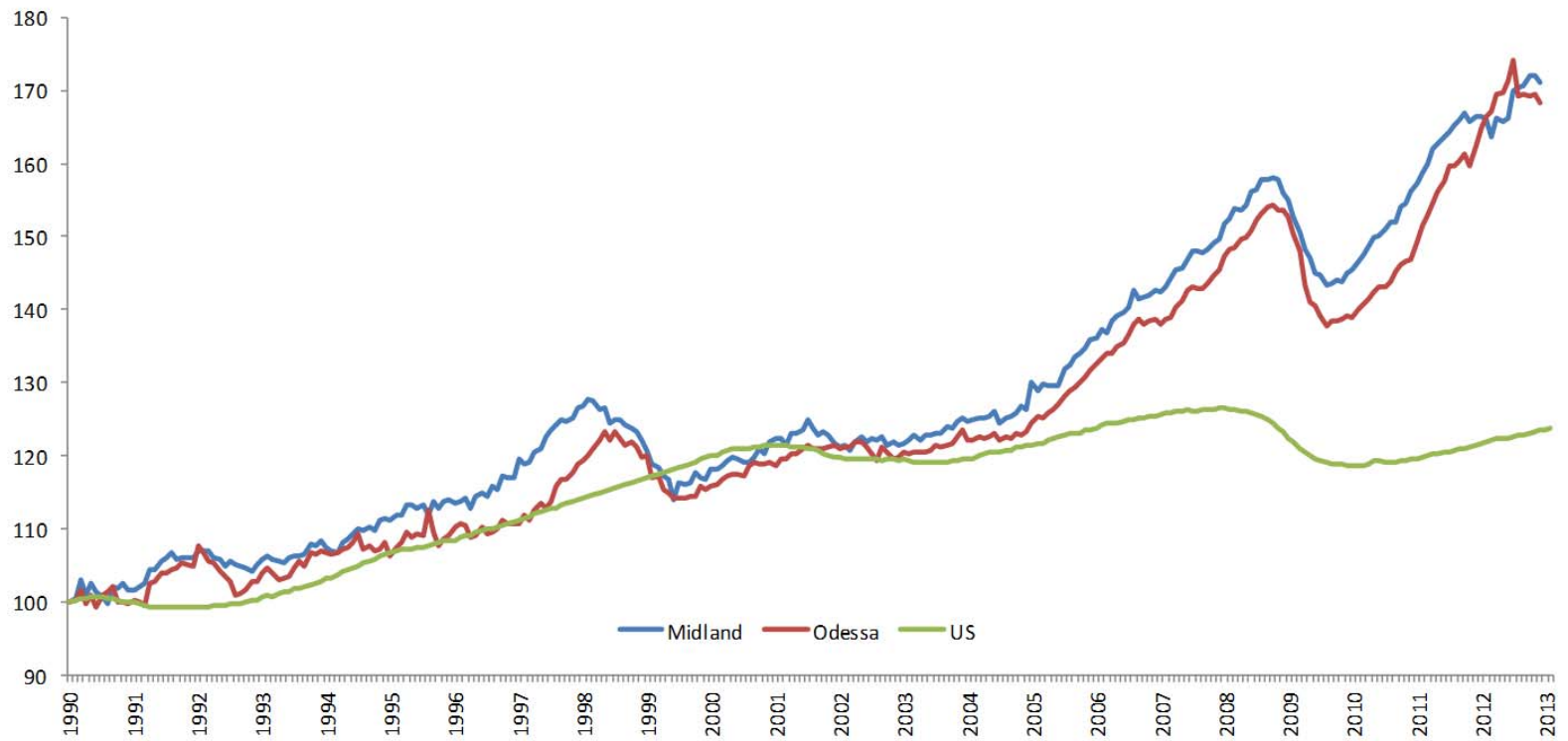
Company	Location	Capacity (mm lb/yr)	Start-Up
Dow Chemical	US Gulf Coast	4,200	2014-2017
Ineos	Lake Charles, LA	3,000	2018
CP Chem	Baytown, TX	2,500	2016/2017
Braskem/Idesa	Mexico	2,200	2015
Shell Chemical	Northeast US	2,000	2016+
Formosa	Point Comfort, TX	1,760	2015
LyondellBasell	Texas, Illinois	1,450	2012-2014
Dow Chemical	Hahnville, LA	800	2012Q4
Williams	Lake Charles, LA	600	2013Q3
Westlake Chemical	Lake Charles, LA	230	2012
Ineos	Chocolate Bayou, TX	230	2013

Source: Chemical Week, December 2011

Oil and natural gas have separated
Midland and Odessa from the rest of the
country for the last four years ...

Midland & Odessa outperform US by wide level in job growth since 2000

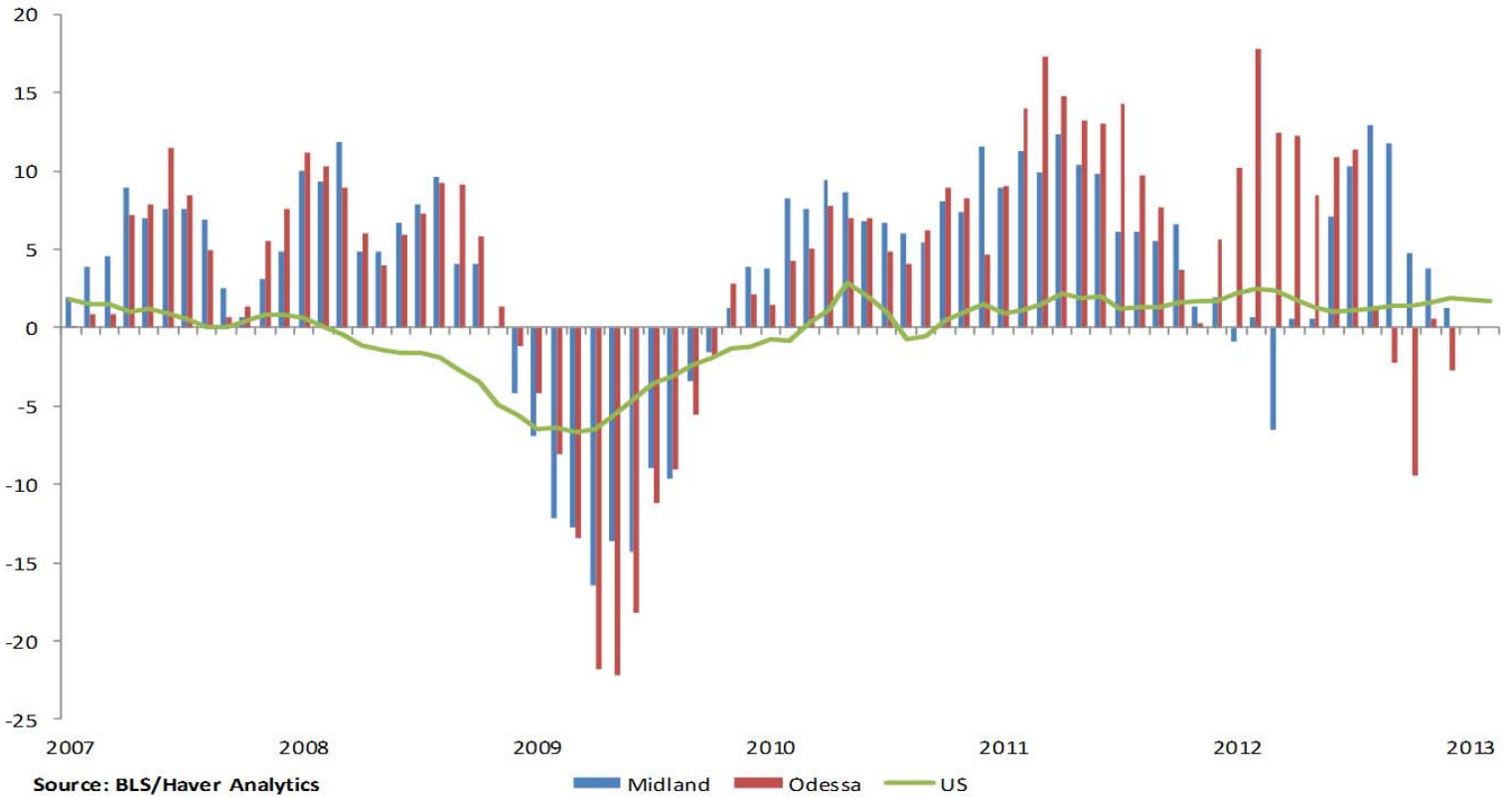
Non-farm employment, Jan-1990=100, SA



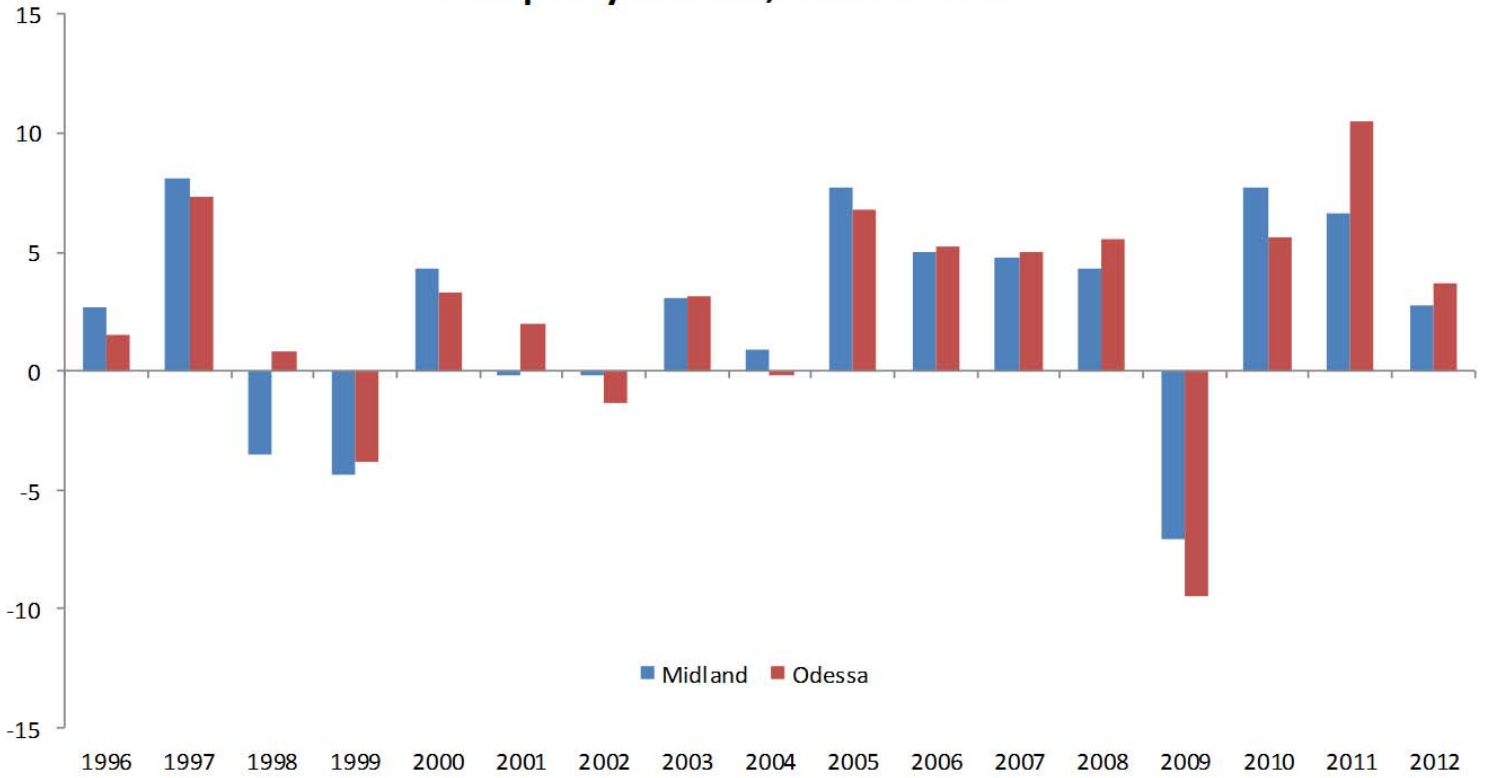
Source: BLS/ Haver Analytics

Midland Odessa job losses have disappeared Lowest Unemployment in the country!

3-mo-moving average of % job growth

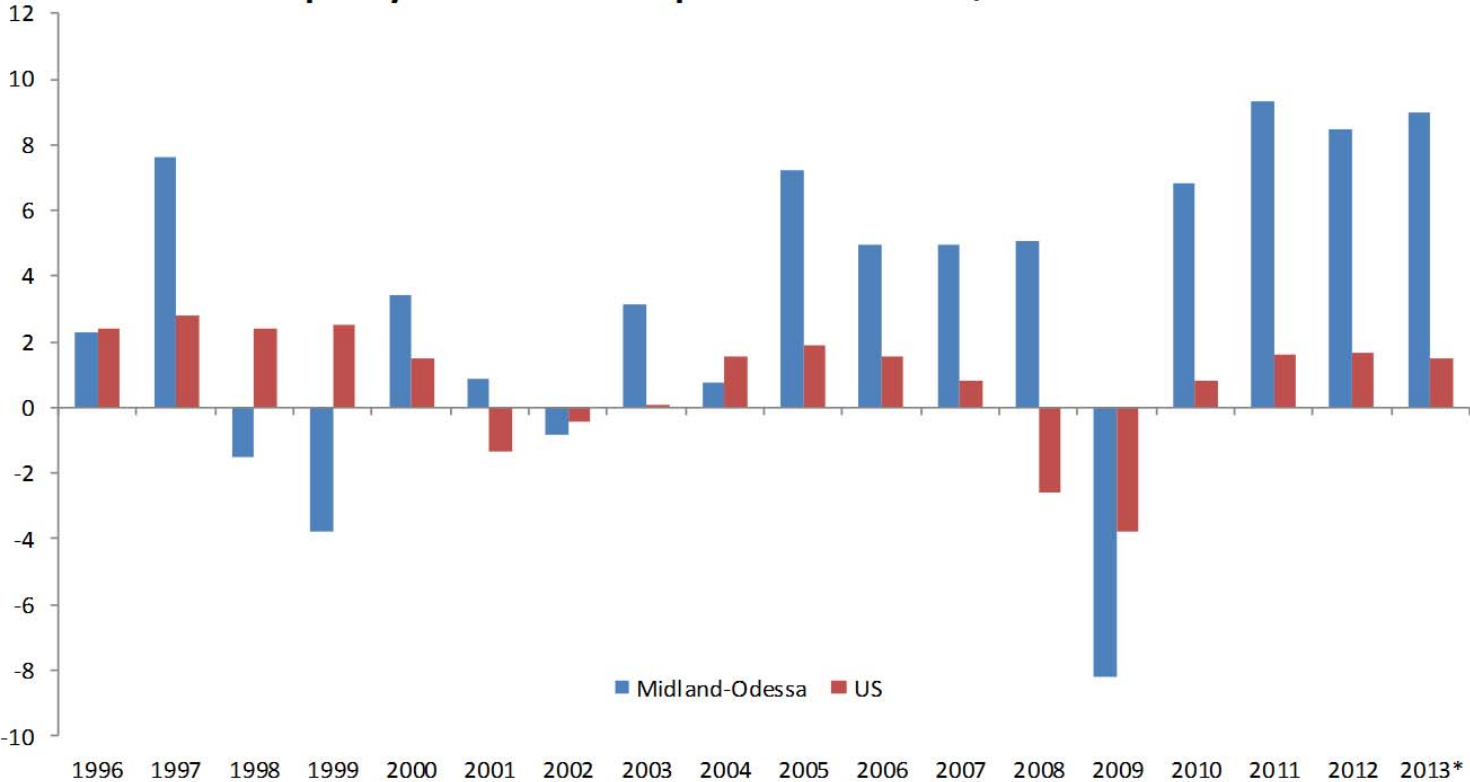


Percent change in Midland and Odessa Employment, 1996-2012



Source: BLS/Haver Analytics
Note: Dec/Dec SA data

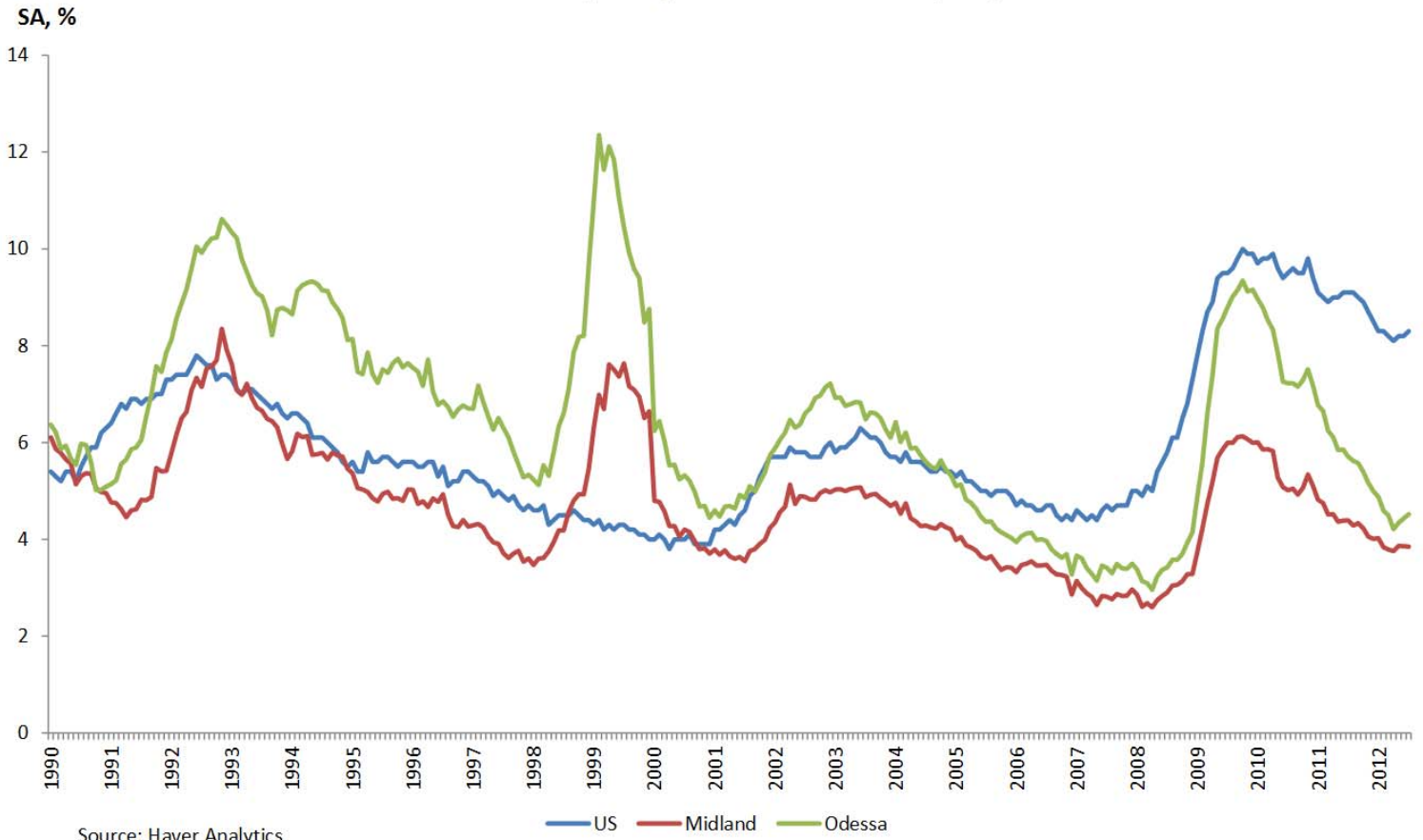
Annual percent change in Midland-Odessa Employment compared to US, 1996-2012



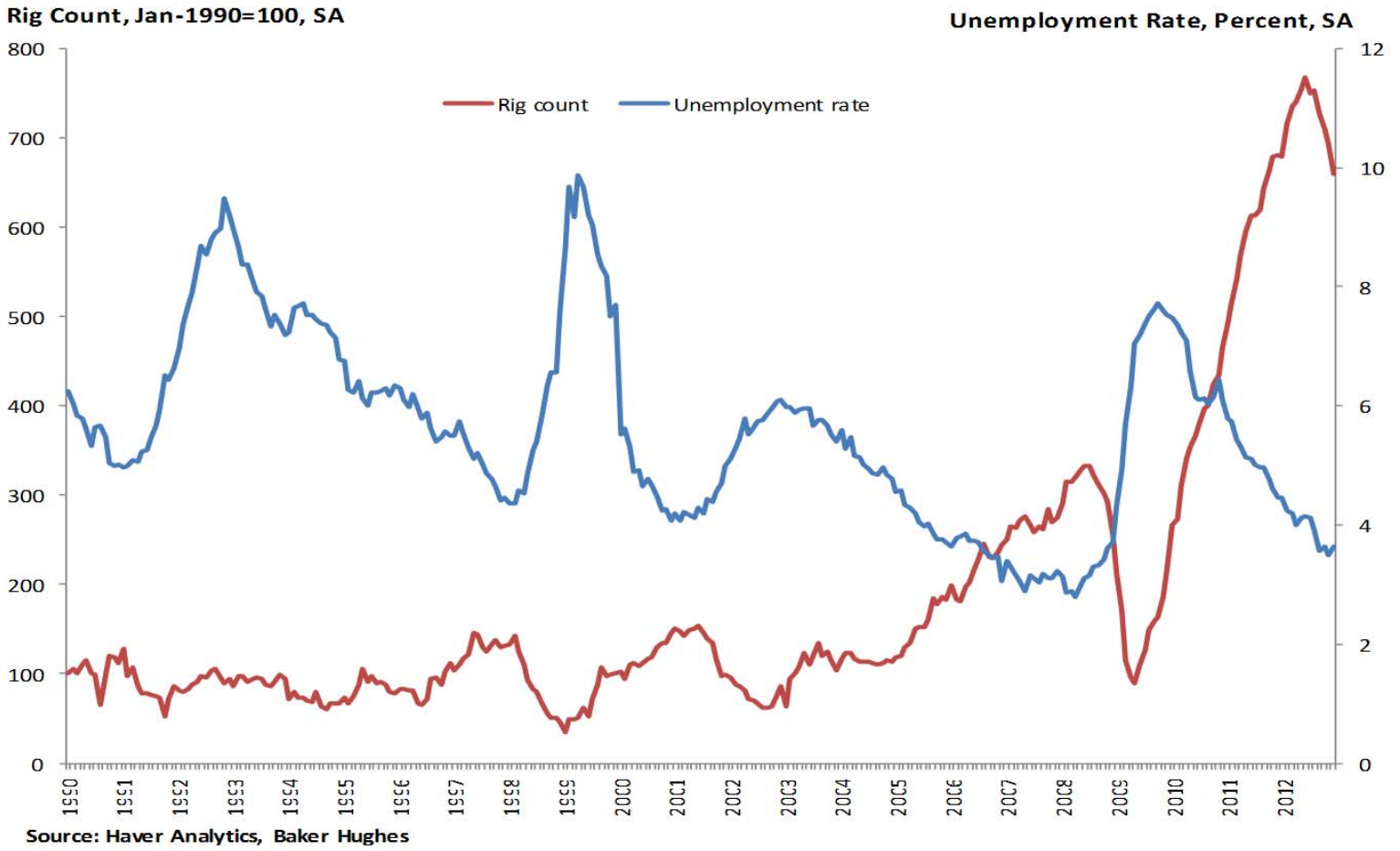
Source: BLS/Haver Analytics

Note: Dec/Dec SA data, 2013* Jan/Jan

Unemployment rate(%)



Baker Hughes TX district 8 rig count and Midland-Odessa unemployment rate



Outlook



Outlook



Outlook



- **Hydrocarbon Industries continue to drive Texas growth rates ahead of the U.S.**
- **Is the Global Economy Slowing?**
- **Uncertainty: Regulatory, Fiscal, Eurozone**

Outlook is Positive

Short Term Risk is All Downside

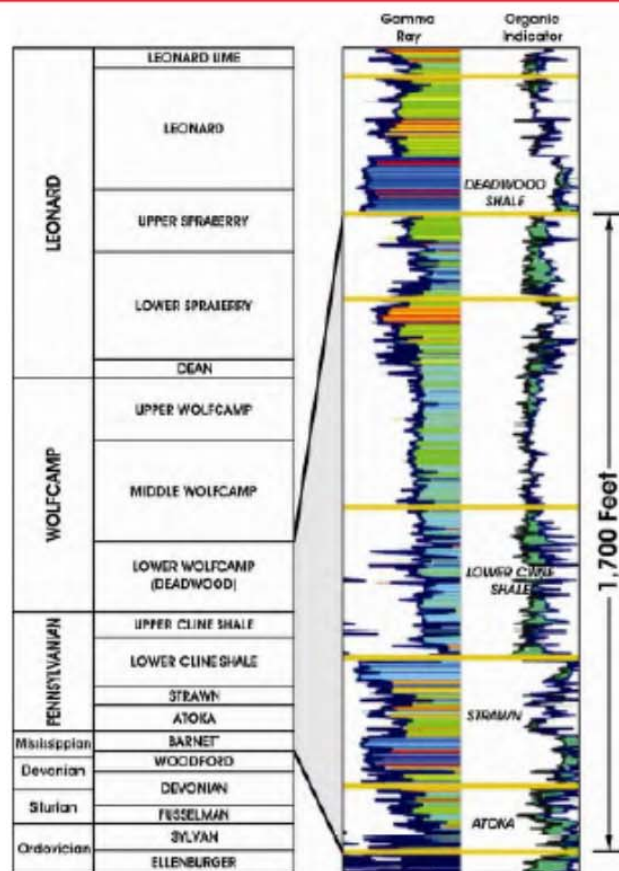
Midland Basin Activity – Cline Shale – Good Rock and Fluid Properties

The Cline Shale has high thermal maturity and pressure gradient values essential for shale plays

Cline Shale Type Log (Apache)

- Pennsylvanian Cline Shale

- Interbedded shale with sand and silt
- Depths of ~9,000 to 9,500 feet
- Thicknesses of 200 to 350 feet
- 2 to 7.5% TOC
- Thermal maturity (%RO) 0.85 to 1.1
- 5 to 8% porosity
- 25 to 35 MMboe/section OOIP
- 40 to 45 degrees API gravity oil
- 1400 BTU associated gas
- Pressure gradient (Psi/ft) 0.55 to 0.65

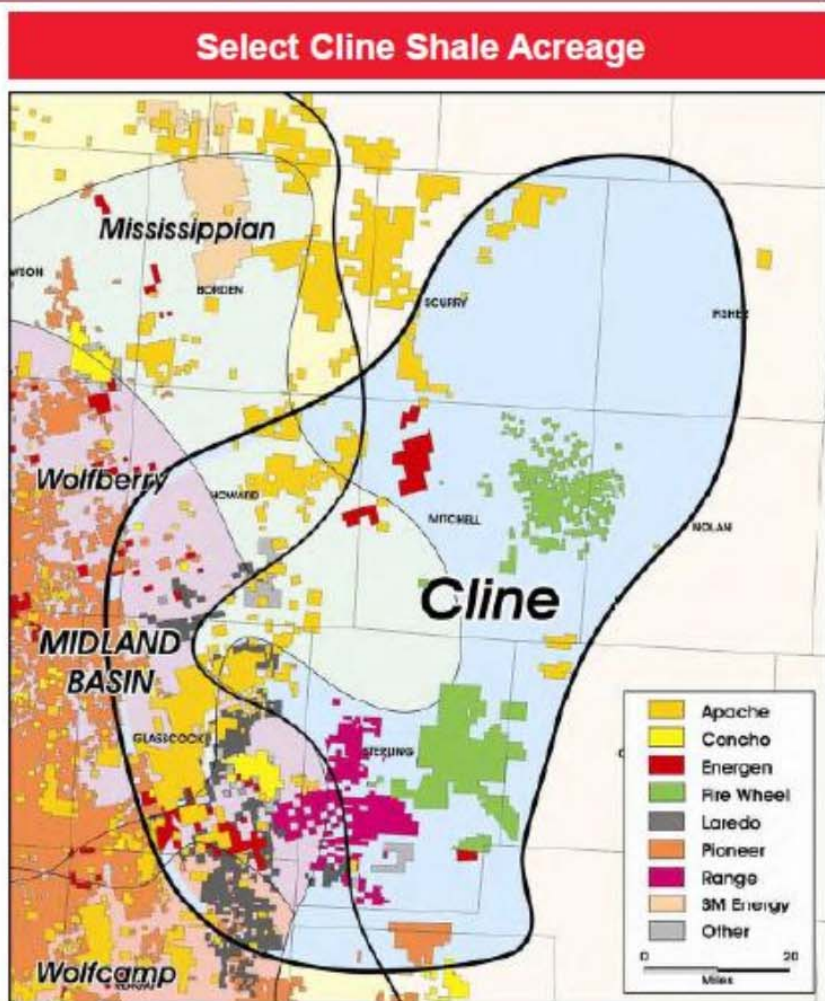


Midland Basin Activity – Cline Shale – Acreage Positions

- Glasscock and Sterling are the most active
- Devon holds the most acreage: 556K net acres
- Laredo has a large position and is the most active operator in the Cline

Cline Net Acreage Positions by Operator

Operator	Cline Net Acreage
Devon	556,000
Apache	334,000
Laredo	196,000
Oxy	160,000
FireWheel	150,000
Range	100,000
Energen	80,000
Clayton Williams	38,100
Callon	14,470



Note: acreage shown is approximate and some company's positions are incomplete
 Source: Sofia Waterous, company presentations

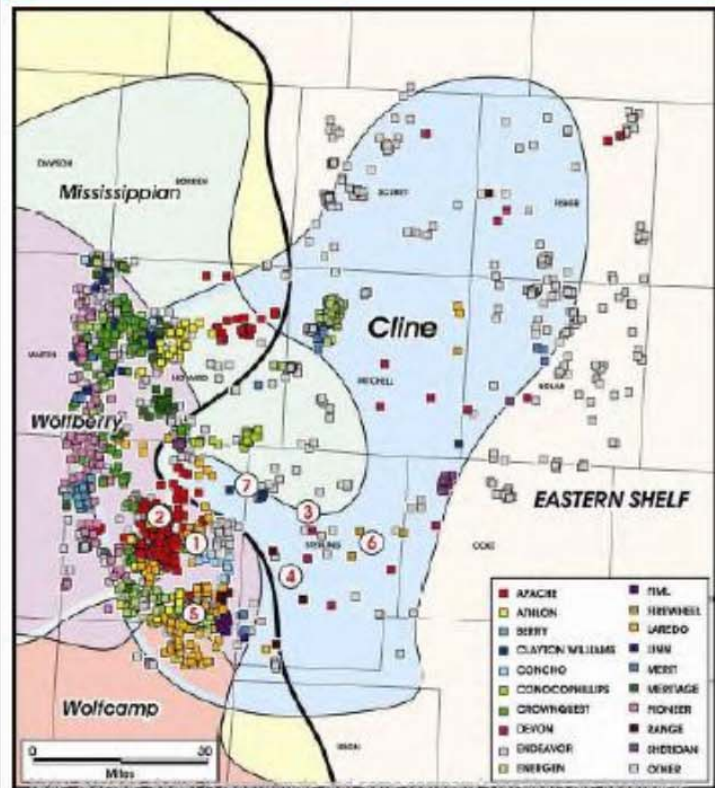
Midland Basin Activity – Cline Shale – D&C at Early Stage

- Laredo
 - D&C costs \$11.1 MM, EUR 784 Mboe, 60% oil
 - 7,500 ft lateral, 28 frac stages

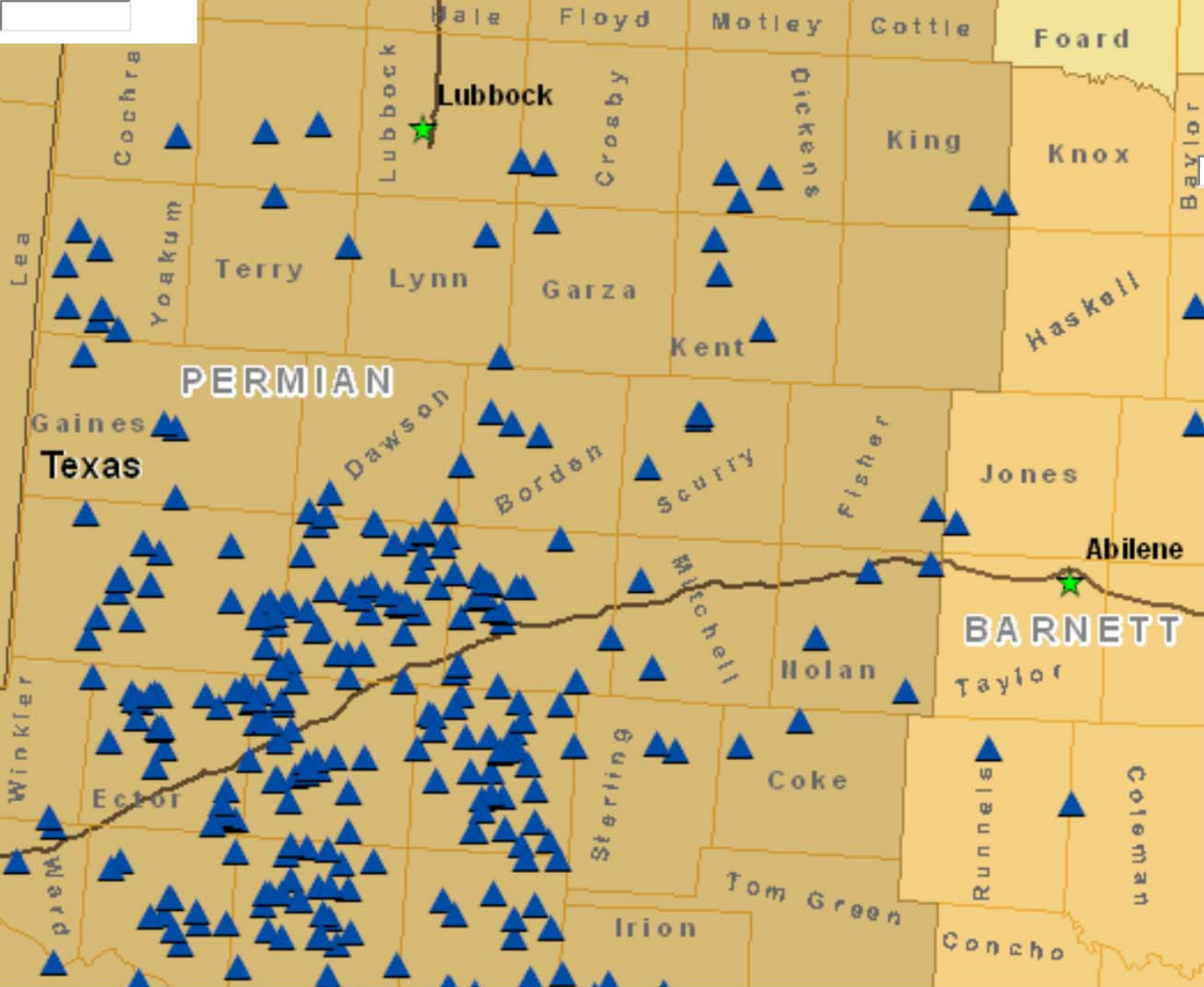
- Apache
 - D&C costs \$7.6 MM, EUR 423 Mboe, 87% liquids,
 - ROR 28% based on 6,800 ft lateral, 15 frac stages
 - IP30s of 306 to 469 Boe/day, EURs 397 to 440 Mboe
 - Lateral lengths 3,800 to 6,840 ft, frac stages 10 to 15

- Range
 - \$4.3 MM well cost for 3,000 ft lateral, 10 frac stages,
 - EURs ~350 Mboe

Cline Shale Activity with Area Permits⁽¹⁾



Source: Scotia Waterous, IHS, company presentations
 (1) Permits as of Jan-Oct 2012

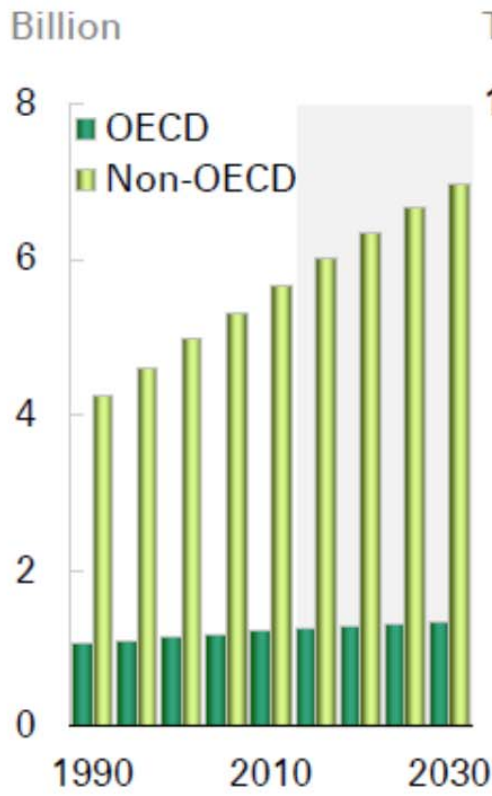


THE WORLD VIEW

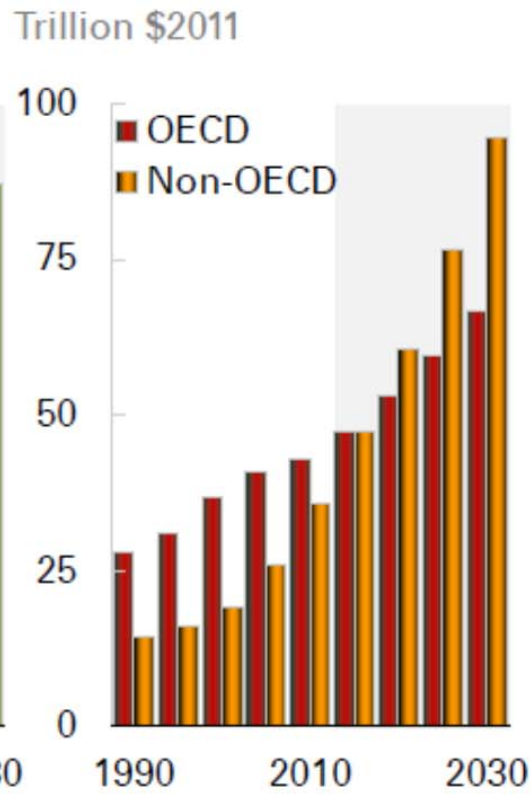
**WHERE WE HAVE BEEN, WHERE
WE ARE GOING IN ENERGY**

The world we live in...

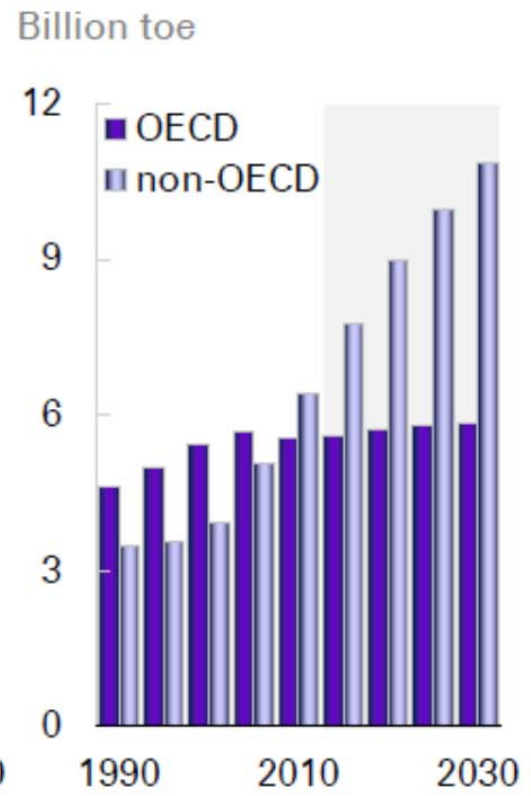
Population



GDP

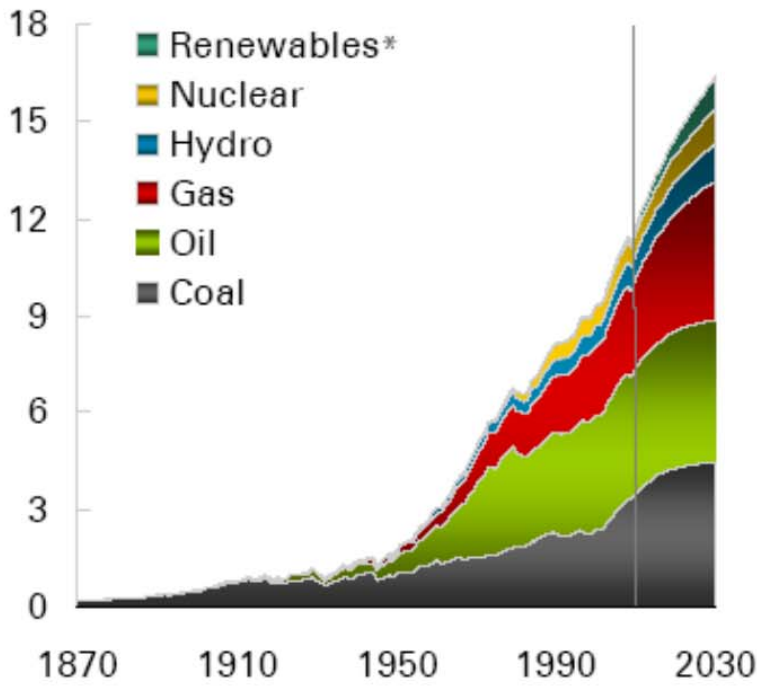


Primary energy



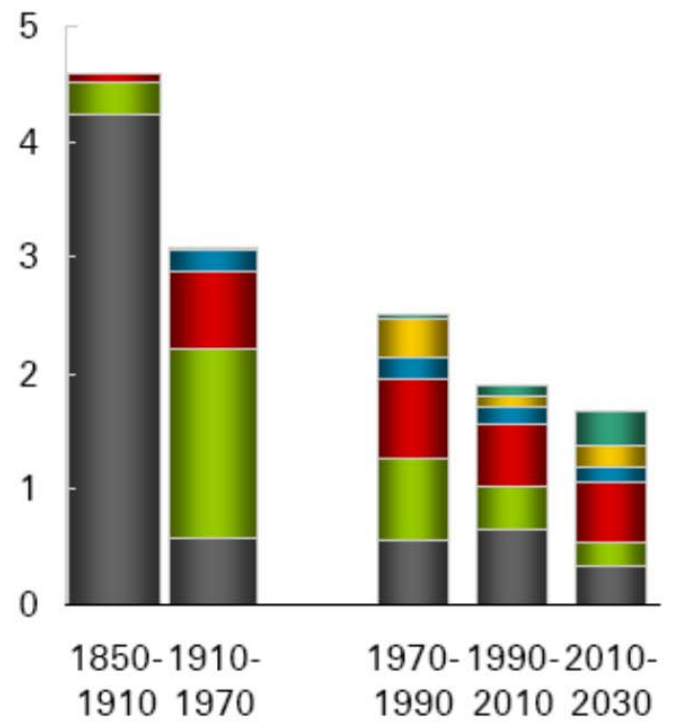
World commercial energy use

Billion toe



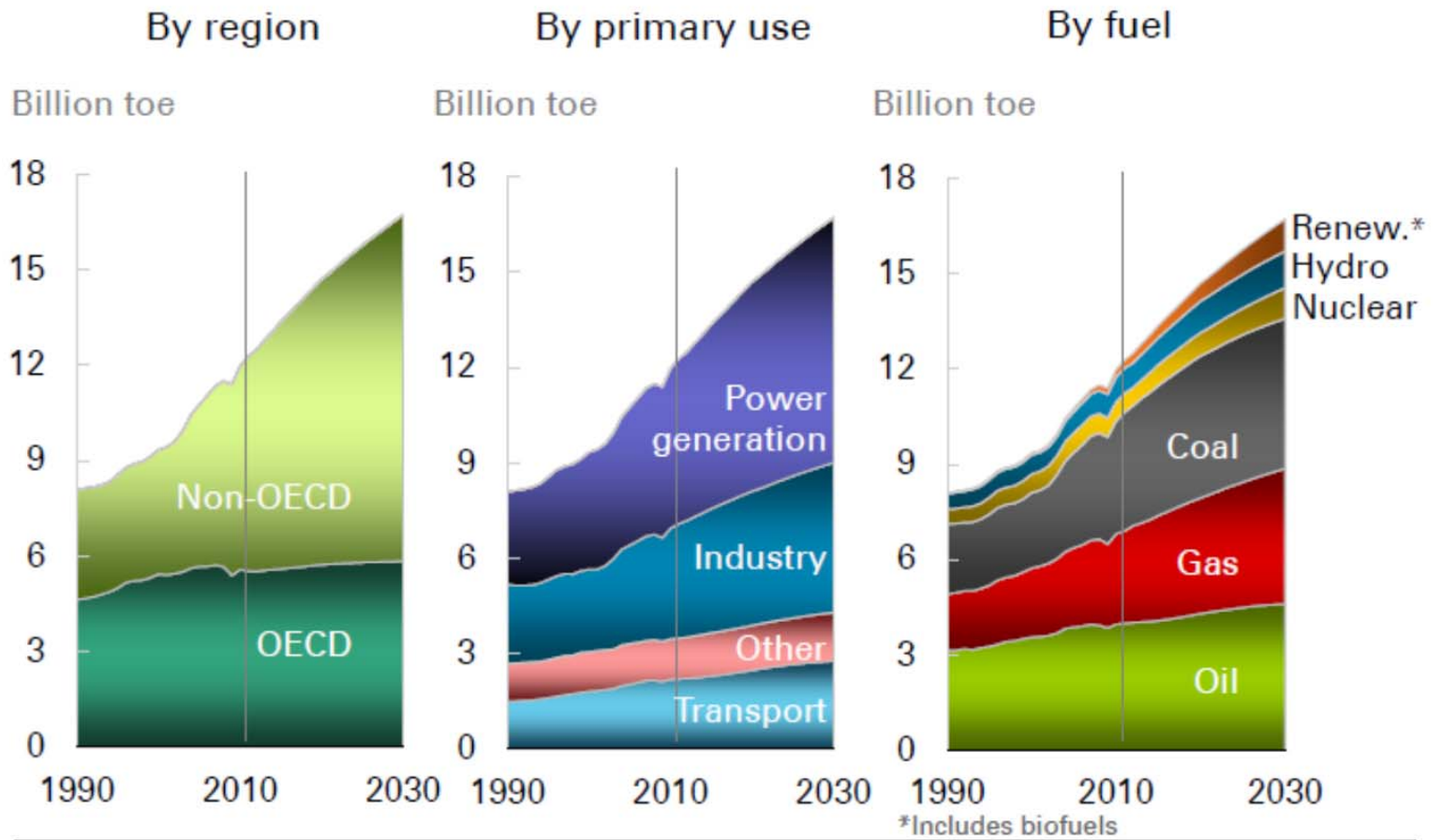
Contribution to total energy growth

% p.a.



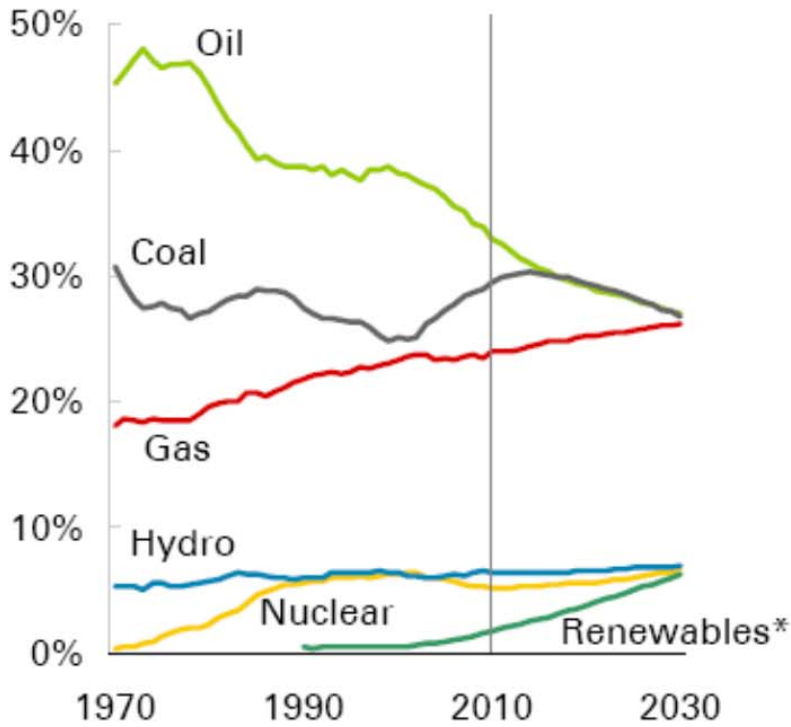
* Includes biofuels

Emerging economies dominate energy production growth...

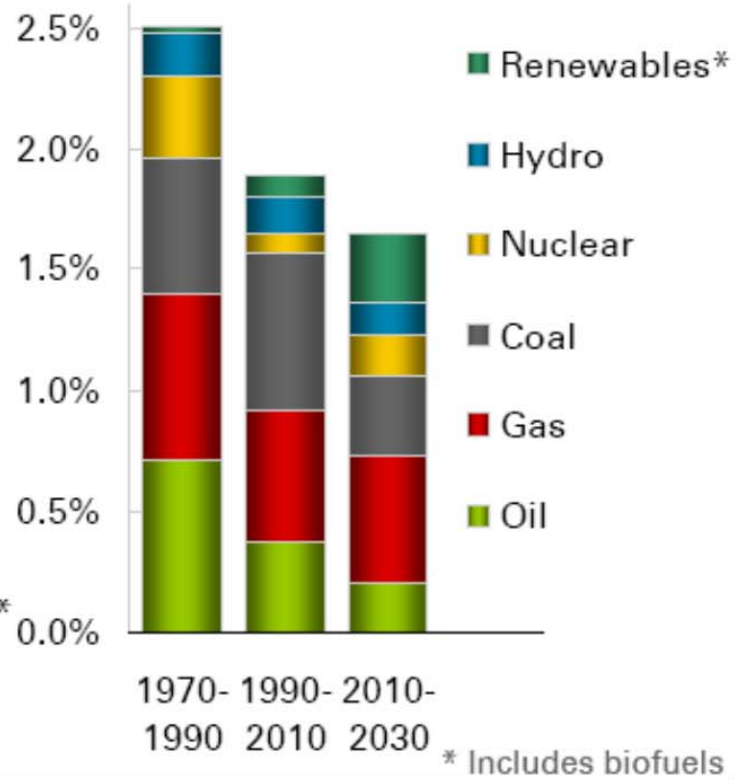


Gas and renewables win as fuel shares converge...

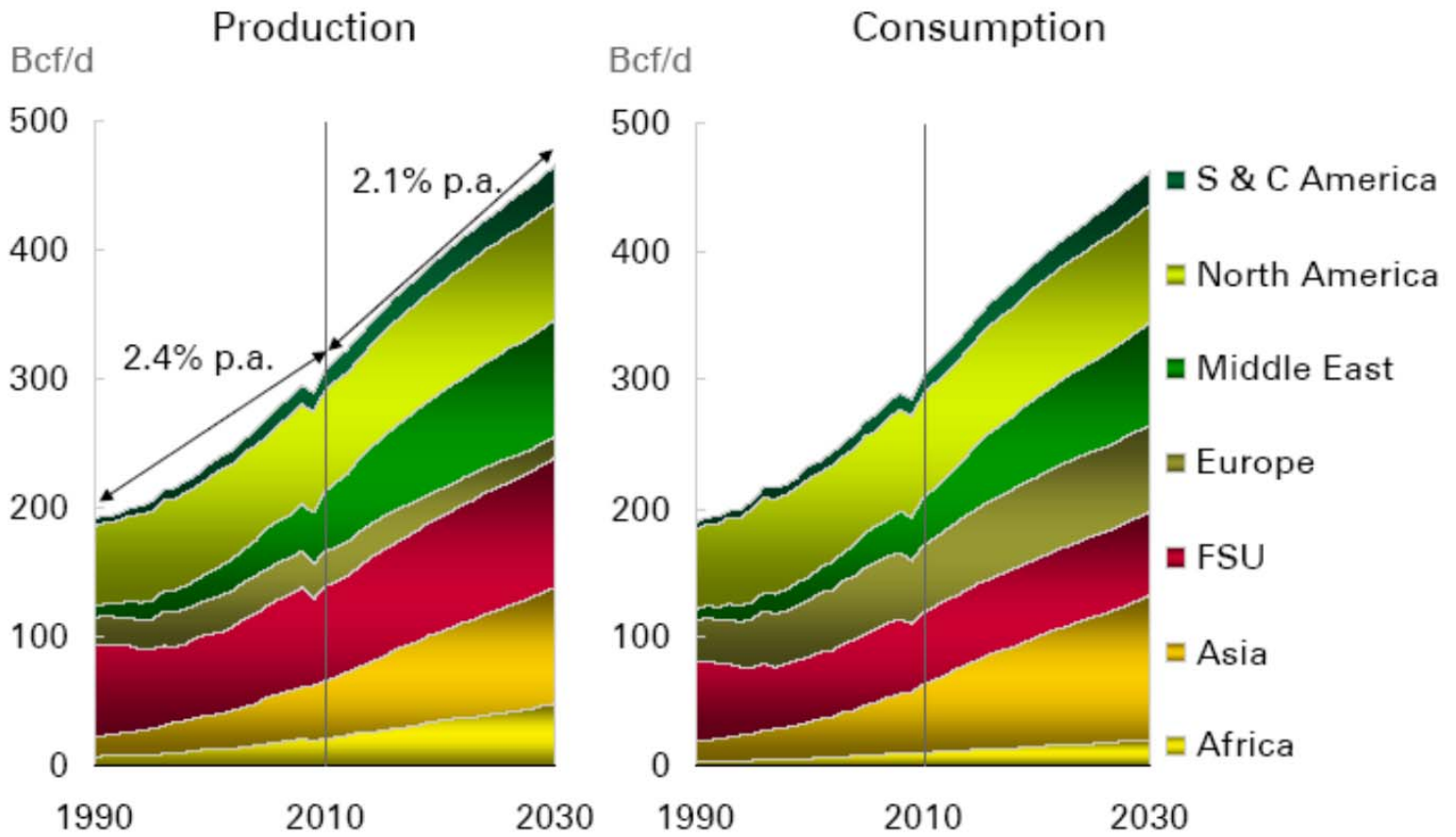
Shares of world primary energy



Contributions to growth

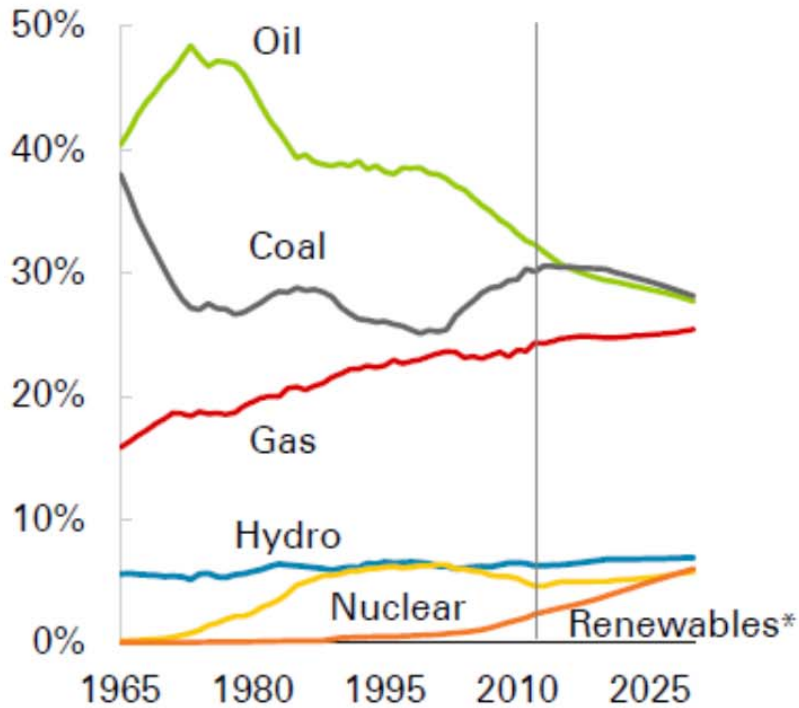


Gas production and consumption growth moderates...



Energy prices play a key role...

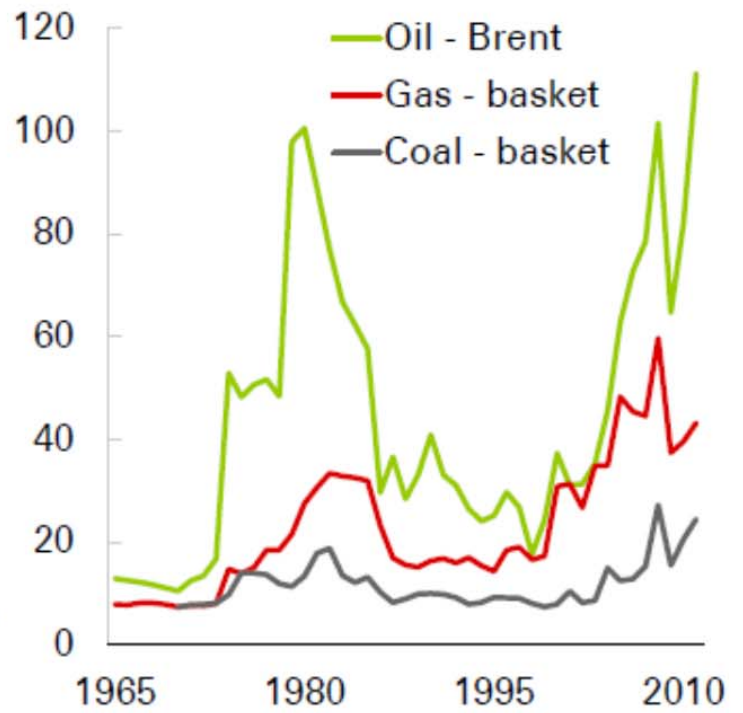
Shares of world primary energy



*Includes biofuels

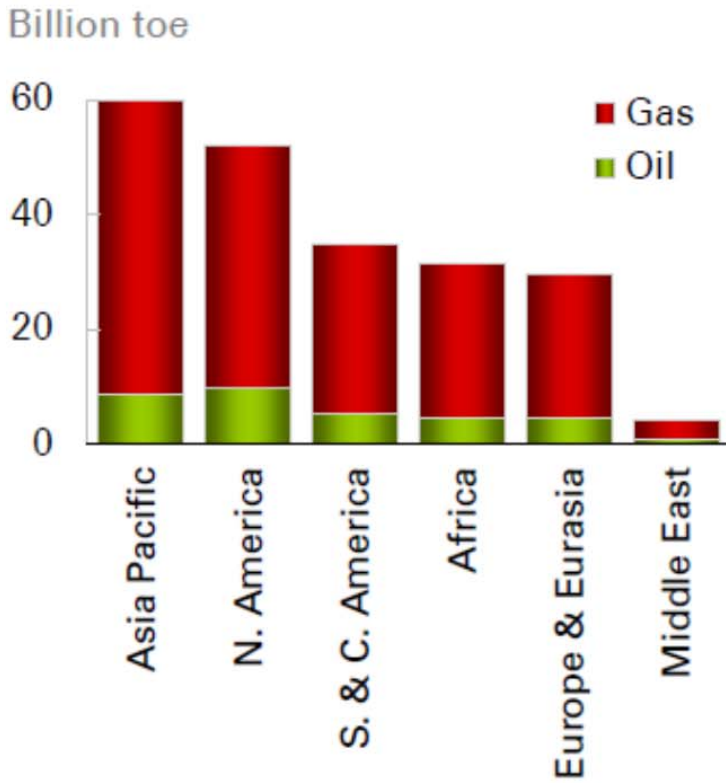
Energy prices

\$2011/boe

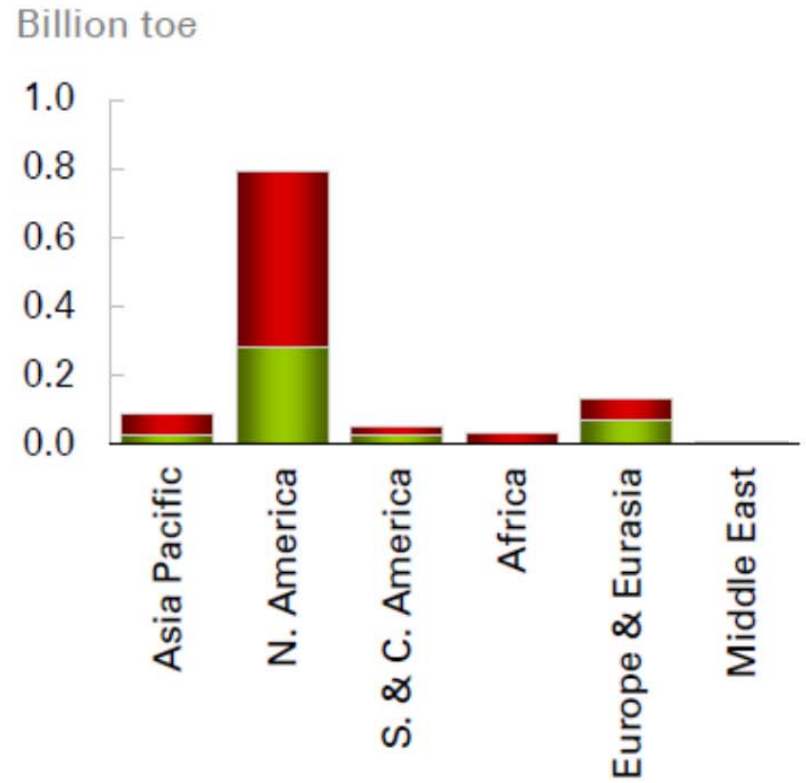


Shale gas and tight oil resources and production...

Current resources



Production in 2030



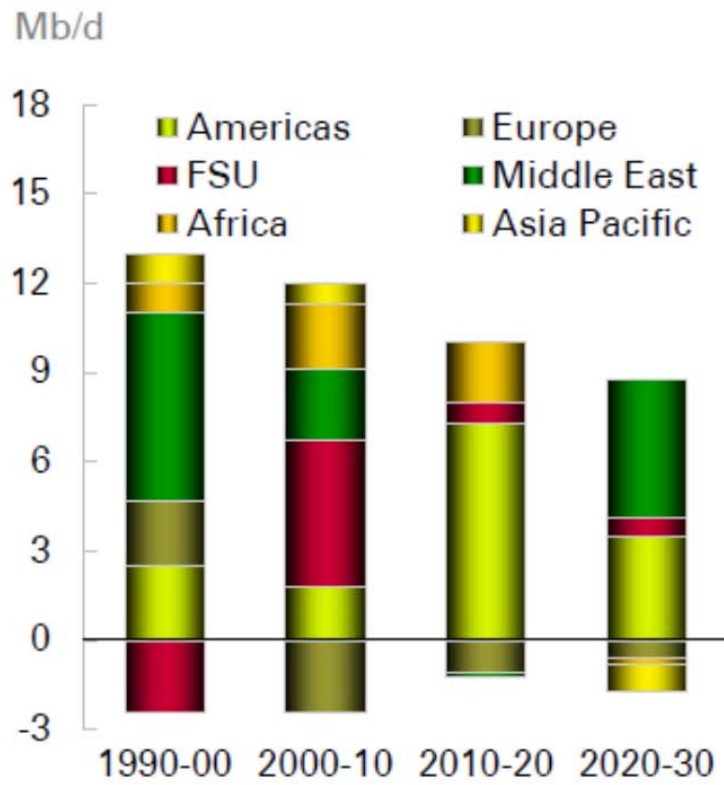
Resources data © OECD/IEA 2012

...highlight the importance of above-ground factors

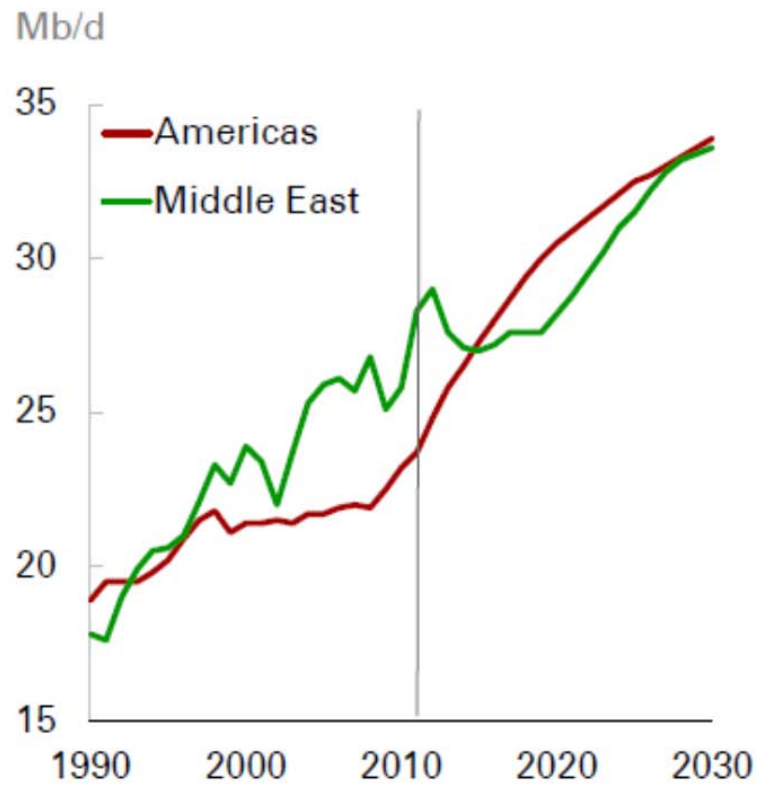
- High prices and technological innovation have unlocked vast unconventional resources in the US, reversing the trend of falling output and altering global energy balances.
 - Globally there are estimated technically recoverable resources of 240 billion barrels (Bbbls) for tight oil and 200 trillion cubic meters (Tcm) for shale gas. Asia has an estimated 57 Tcm of shale gas and 50 Bbbls of tight oil, versus 47 Tcm and 70 Bbbls respectively for North America.
 - In 2012, 2.1 Mb/d (24%) of US oil production was from tight oil and 24 Bcf/d (37%) of natural gas from shale. These resources have boosted gas output by nearly 20% and oil by 30% in the past five years.
 - Assessing both global resources and “above ground” factors, North America will continue to dominate production by 2030, even as other regions gradually adapt to develop their resources.
-

With the Americas dominating global supply growth...

Supply growth by decade



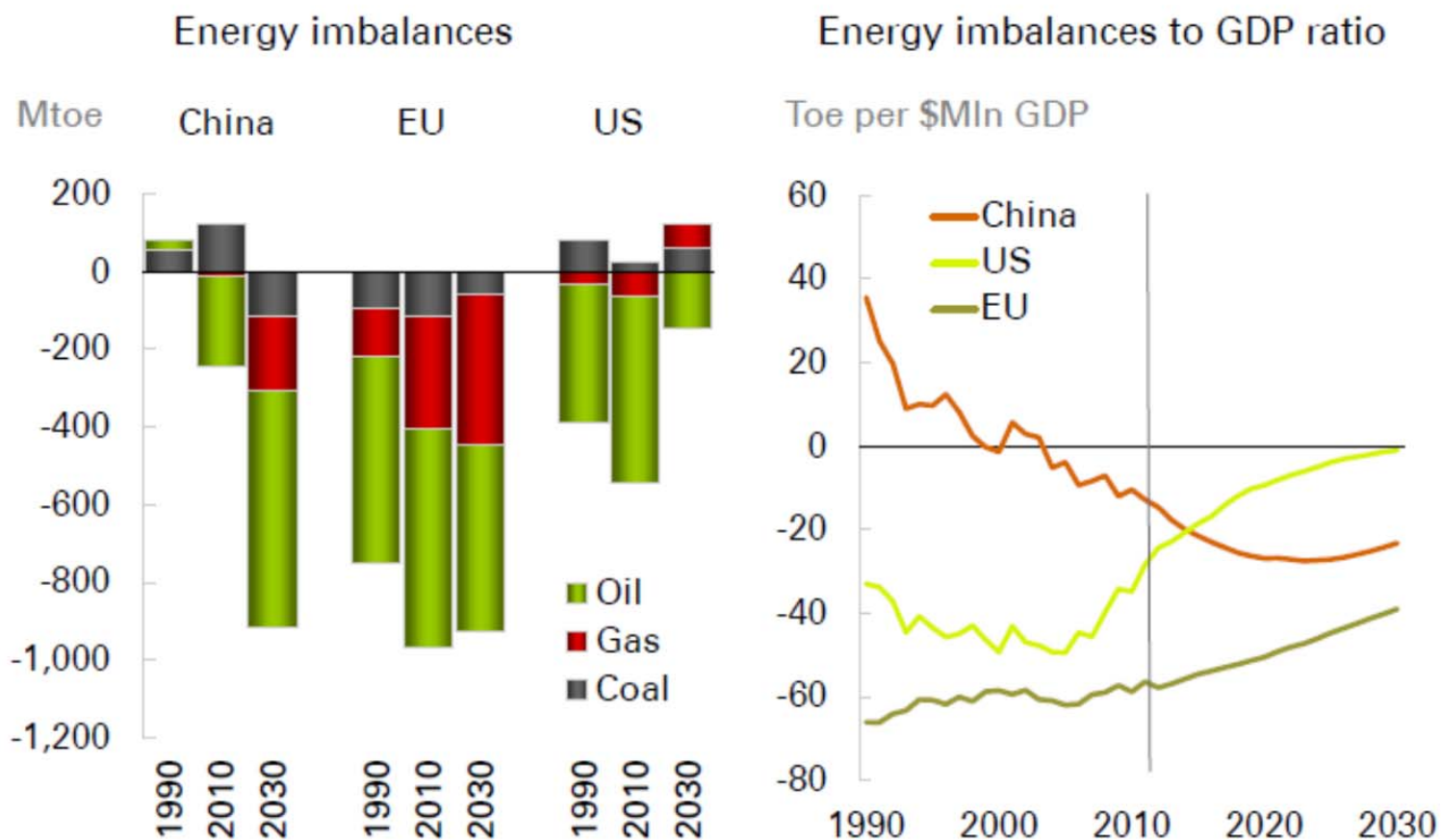
Americas surpass Middle East



...unconventionals will constrain OPEC output

- The Americas will account for 65% of incremental supply growth to 2030 as tight oil (5.7 Mb/d), oil sands (2.7 Mb/d), and biofuels (1.8 Mb/d) drive growth. The US (4.5 Mb/d) leads regional increases and will surpass its previous record output reached in 1970.
 - OPEC crude oil output will not return to the expected 2013 level of about 30 Mb/d until 2020 as non-OPEC supplies dominate global growth. From 2020-30, however, supplies will likely expand by 5.1 Mb/d as non-OPEC output growth fades.
 - The US will likely surpass Russia and Saudi Arabia in 2013 as the largest liquids producer in the world (crude and biofuels) due to tight oil and biofuels growth, but also due to expected OPEC production cuts. Russia will likely pass Saudi Arabia for the second slot in 2013 and hold that until 2023. Saudi Arabia regains the top oil producer slot by 2027.
 - The US, Saudi Arabia, and Russia will supply over a third of global liquids in our outlook.
-

Energy imbalances: significant changes in import profiles...



...put into perspective by economic growth

- Growing production and flat consumption will see the US become nearly self-sufficient in energy by 2030. The US will remain a small net importer of oil, although net imports will decline by about 70%. With net exports of natural gas and coal, US energy production will reach 99% of domestic consumption, up from a low of 70% in 2005.
 - China is on pace to match Europe as the world's leading energy importer by 2030, and will replace the US as the world's largest oil importing nation by 2017.
 - However, the growth in Chinese energy imports will be taking place in a context of robust economic growth. Adjusting the volume of energy imports for expected economic growth will leave China relatively less dependent (per unit of GDP) than EU on imported energy.
 - Other things equal, the development of energy imbalances point toward a reduction of global trade imbalances.
-

QUESTIONS?



PERMIAN BASIN COALITION

PARTNERSHIP - PRODUCTION - PROGRESS



D. Kirk Edwards
Las Colinas Energy Partners, LLC
April 2, 2013
Midland, Texas