



The New Energy Reality: Opportunities & Challenges for U.S. Business

**MARS Winter Meeting
Chicago IL
January 15, 2015**

Christopher Guith
Senior Vice President - Policy
Institute for 21st Century Energy
U.S. Chamber of Commerce



The New Energy Reality

Energy Security is central to our national and economic security

- **Demand to increase 56% by 2040**
 - **90% in non-OECD countries**
- **Electricity demand to increase 76%**
- **1.4 billion people without electricity**
- **\$38 trillion of new investment by 2035 to meet rising demand**
- **90% world's oil reserves owned by national oil companies**



We Possess Tremendous Domestic Energy Resources

● Technically Recoverable Resources

- 120 years of Nat Gas
- 206 Years of Oil
- 464 years of Coal

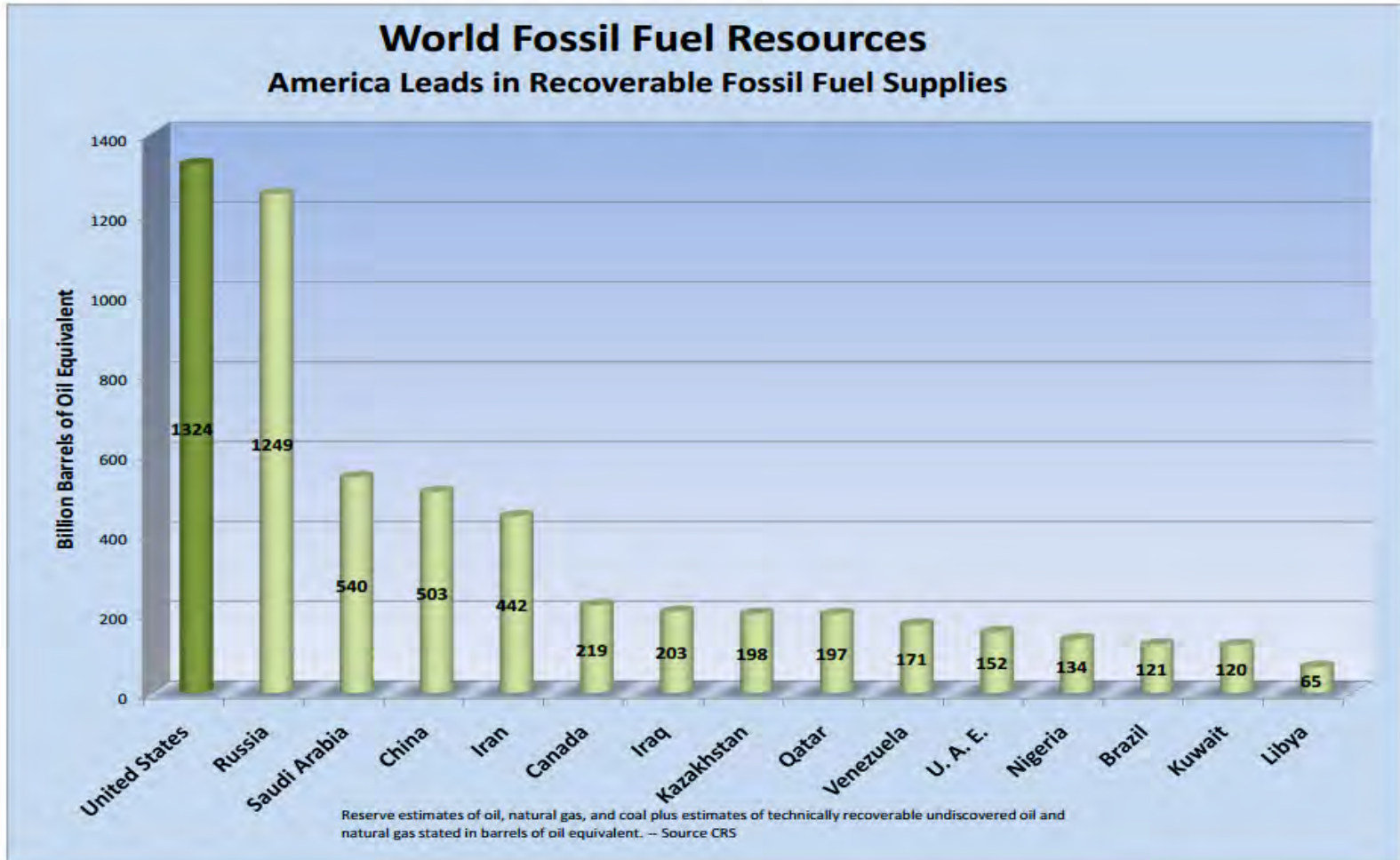
● In-place Resources

- 586 years of Nat Gas
- 536 years of oil
- 9,844 years of coal

Institute for Energy Research Analysis of U.S. Government Data



America has the Largest Energy Resource Base in the World



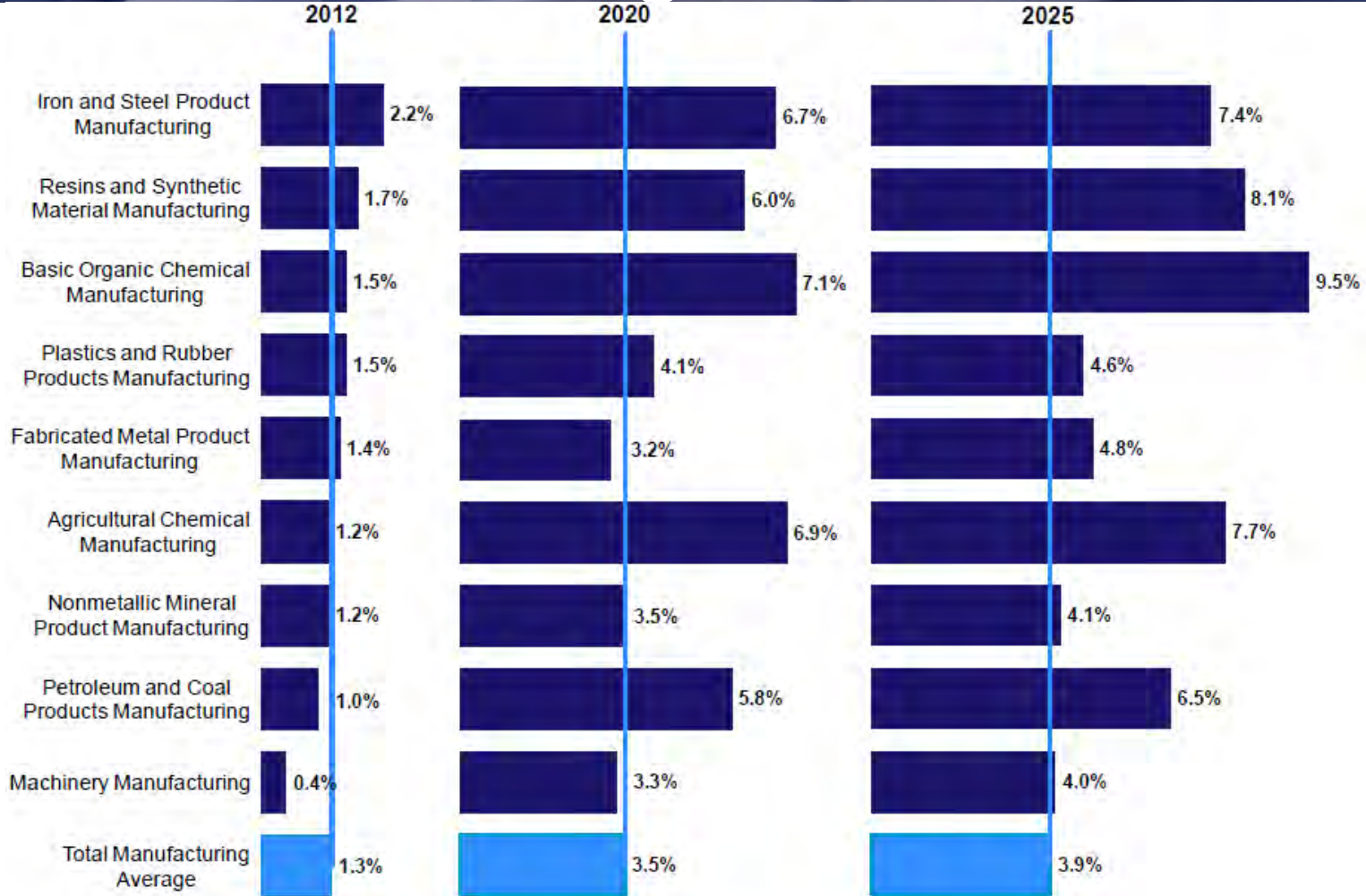


Liquids Supply & Demand Status

- **Crude production has increased 80% since 2005 to 9.1 MMb/d (~ 1.3 MMb/d Condensate).**
- **EIA shows production hitting 9.3 MMb/d in 2015**
- **Several independent analyses show production hitting 12 MMb/d by 2019**
- **U.S. Refinery throughput is hit 16.8 MMb/d.**



Shale Revolution Spawns Manufacturing Renaissance

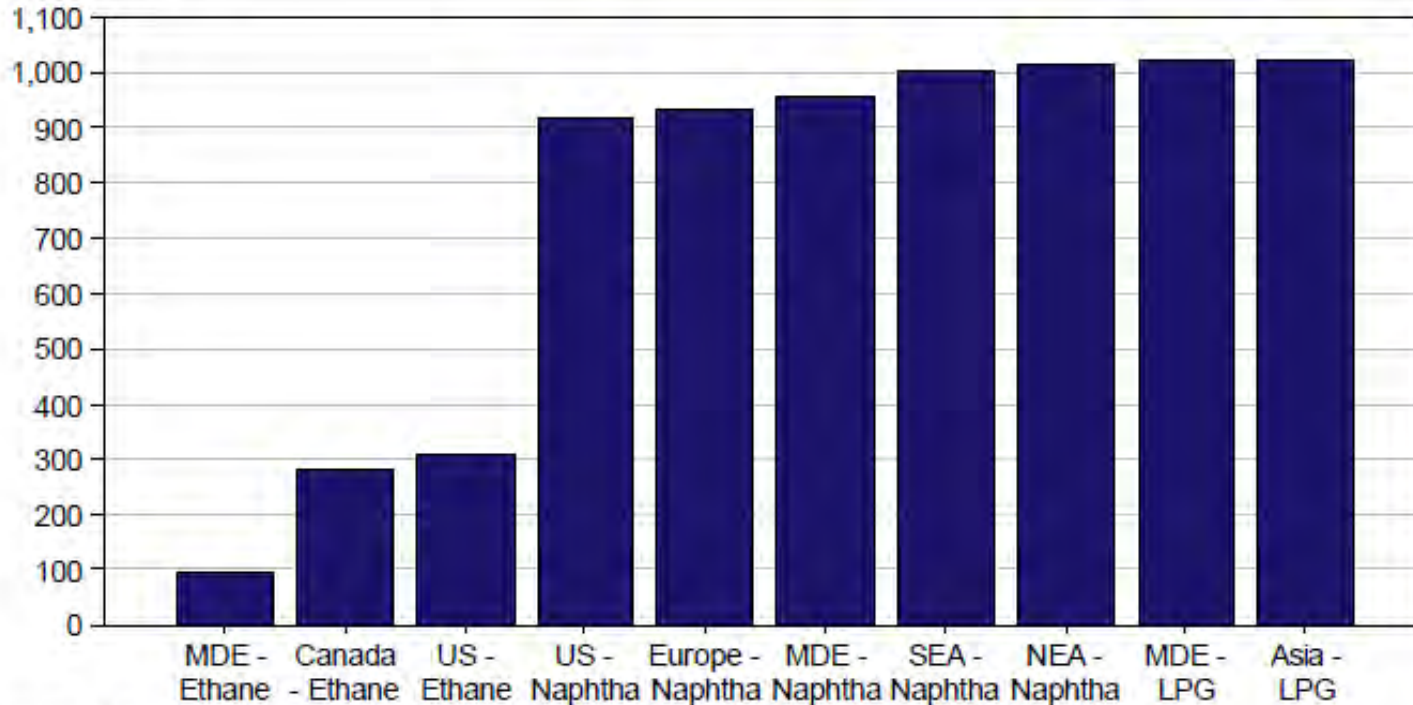




It's All About Price Differential

Cost to Produce One Metric Ton of Ethylene: 2013

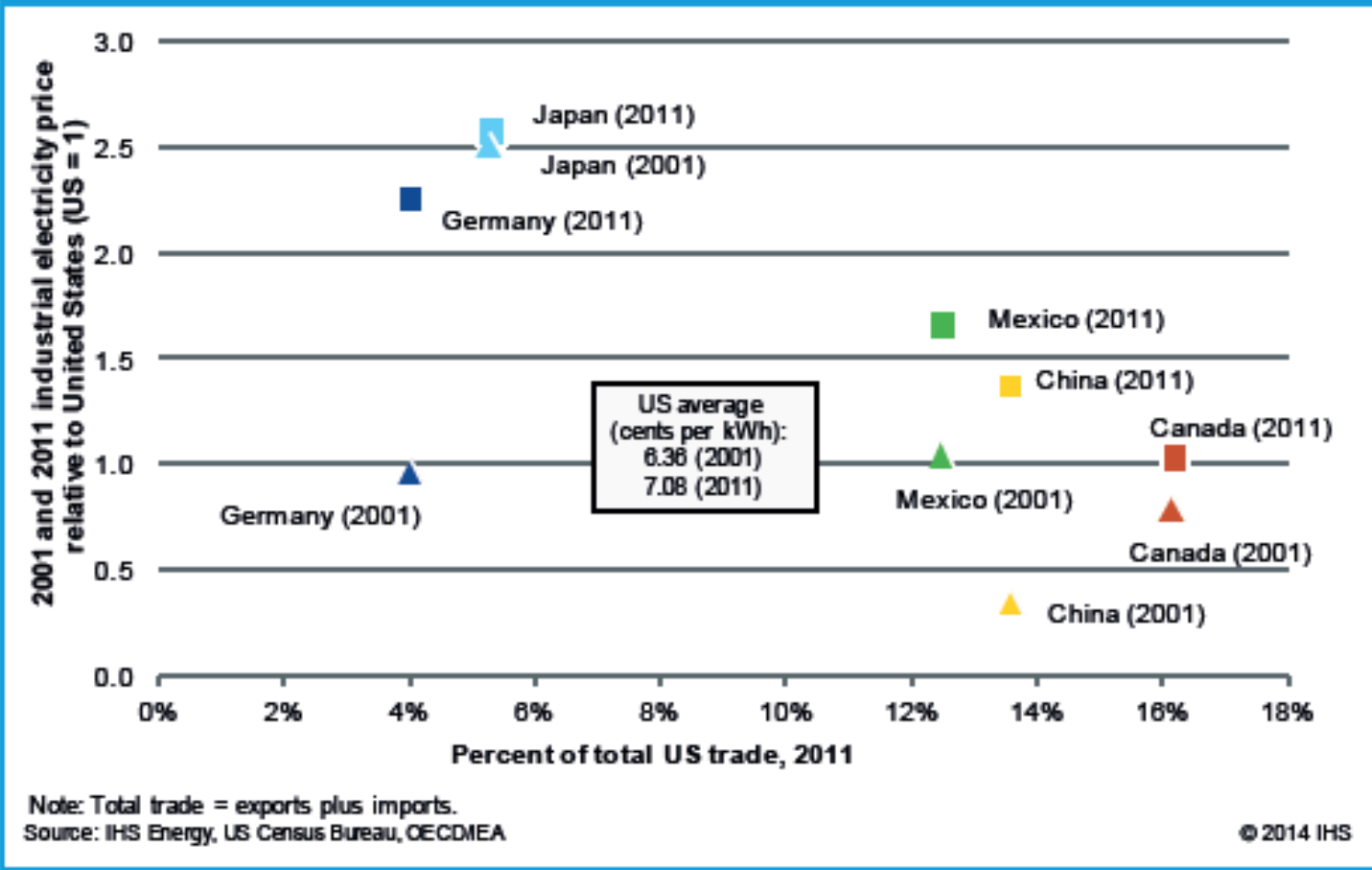
\$US per metric ton



MDE = Middle East, NEA = Northeast Asia, SEA = Southeast Asia

Diversity Has Been a Competitive Advantage

Relative industrial electricity prices for top five US trading partners





America's New Energy Future

Employment Contribution due to the Unconventional Activity Value Chain: Base Case*

(Number of workers)

	2012	2020	2025
Upstream Energy Activity	1,748,604	2,985,168	3,498,678
Midstream and Downstream Energy Activity	323,648	73,530	56,989
Energy-Related Chemicals Activity	53,252	277,356	318,748
Total Activity	2,125,504	3,336,055	3,874,415

NOTES: Numbers may not sum due to rounding.

*The unconventional activity value chain represents the sum of unconventional oil and natural gas value chains and energy-related chemicals.

Source: IHS Economics



America's New Energy Future

Contribution to US Lower 48 Government Revenue due to the Unconventional Activity Value Chain: Base Case*

(2012 \$M)

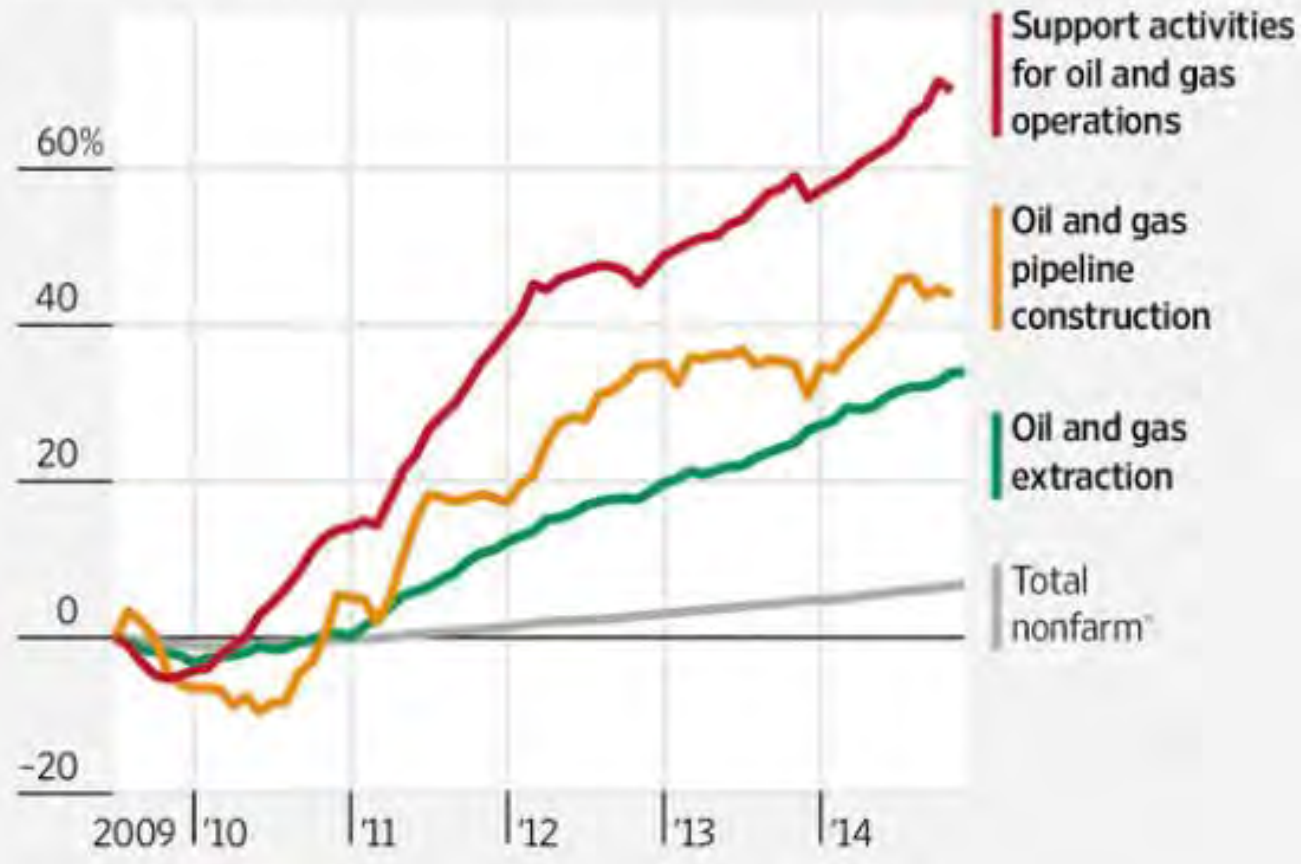
	2012	2020	2025	2012-2025**
Contribution by Type***				
Federal Taxes	35,598	57,702	64,030	750,696
Federal Royalty Payments	1,964	3,204	2,994	39,664
Federal Bonus Payments	148	150	138	2,139
State and Local Taxes	36,732	64,484	71,233	822,137
Total Government Revenue	74,443	125,540	138,395	1,614,636
Lease Payments to Private Landowners	504	915	1,103	11,696

Source: IHS Economics



Oil & Gas is THE Jobs Driver

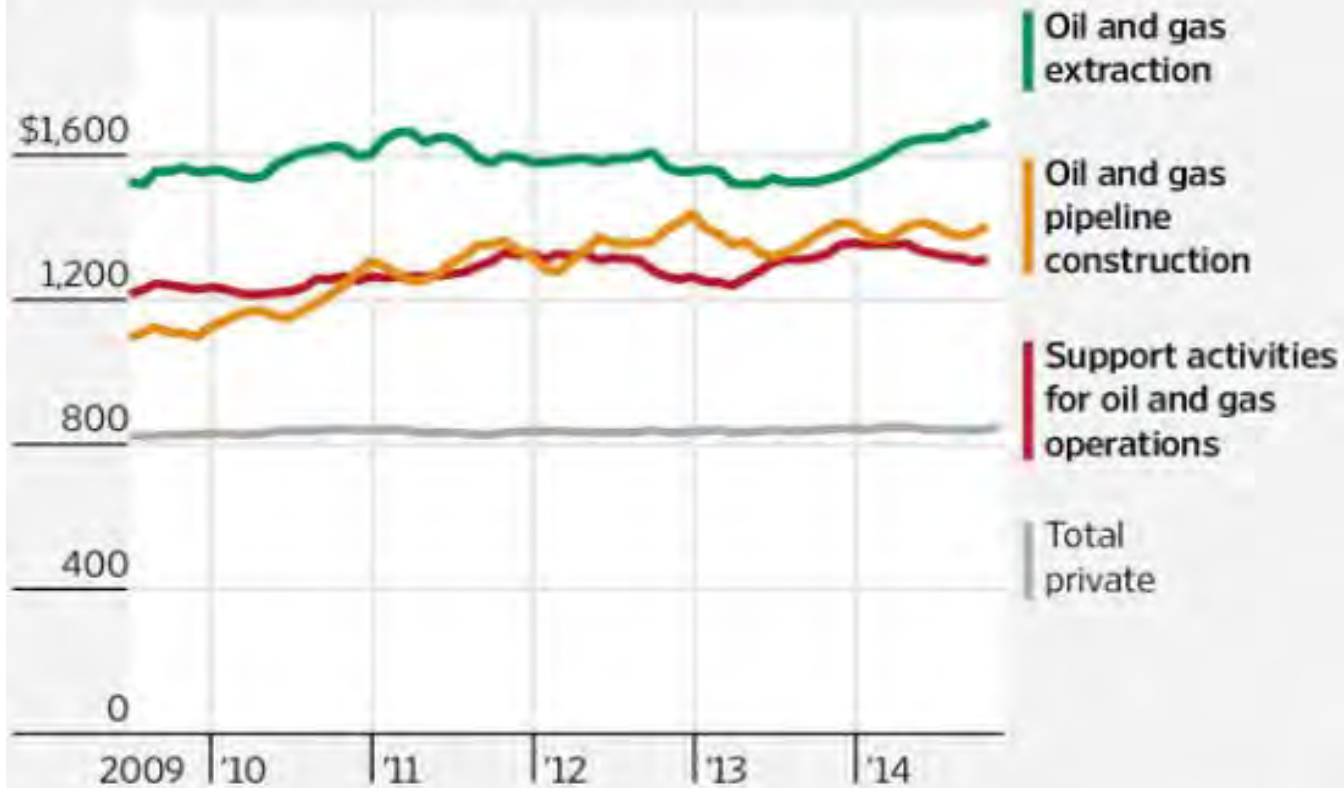
Change in payrolls since June 2009, seasonally adjusted





Oil & Gas is THE Jobs Driver

Average weekly wages for all employees,
three-month moving average, adjusted for inflation



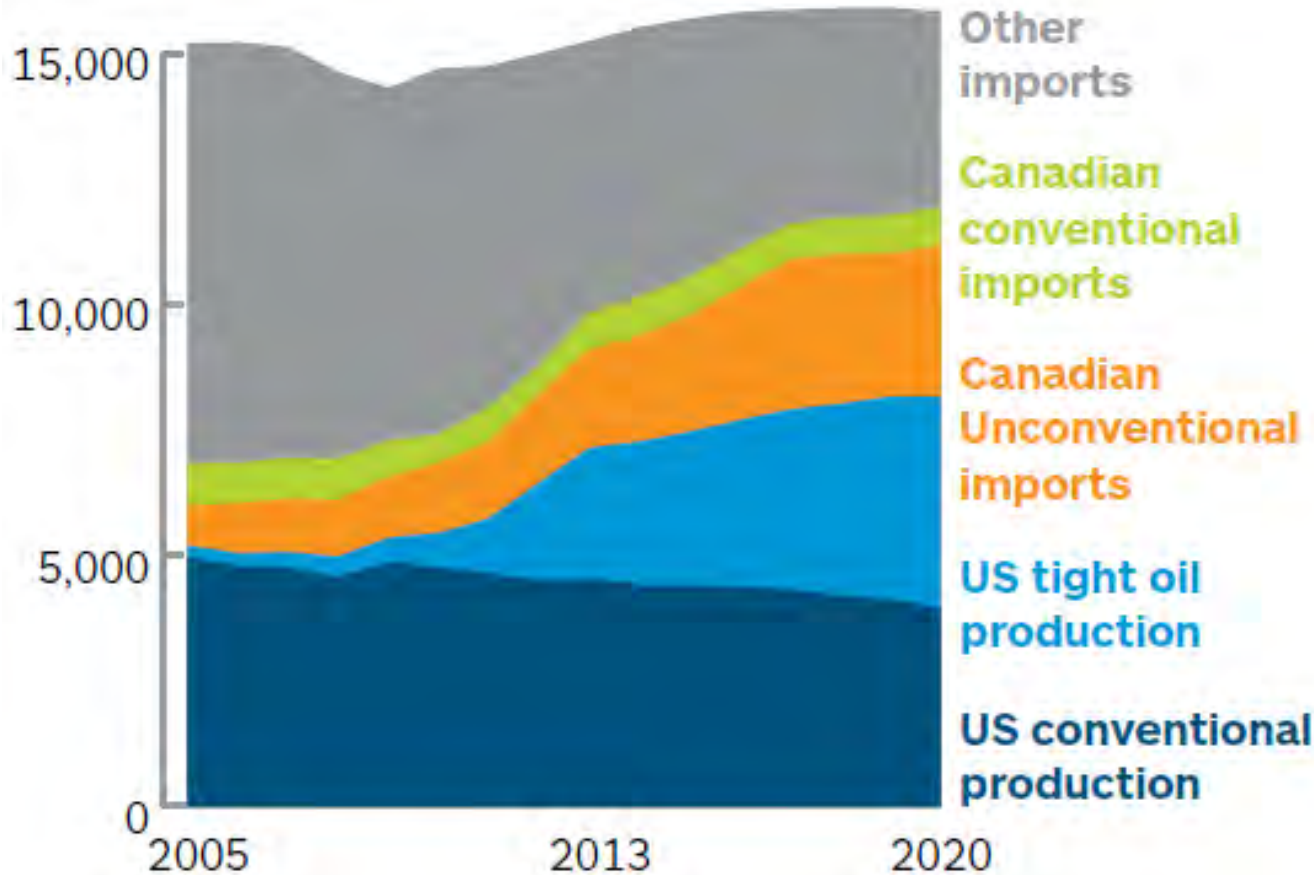
Adjusted to exclude the effect of temporary hiring related to the 2010 Census.

Source: Labor Department

The Wall Street Journal



US Energy Security Increasing in Real Time



Tight Oil increases to 27% of US refinery feedstock by 2020, up from 17% in 2013



Rail Isn't a Stopgap Anymore

Rail deliveries of U.S. oil continue to increase in 2014

Average weekly U.S. rail carloads of crude oil and petroleum products

number of rail carloads per week

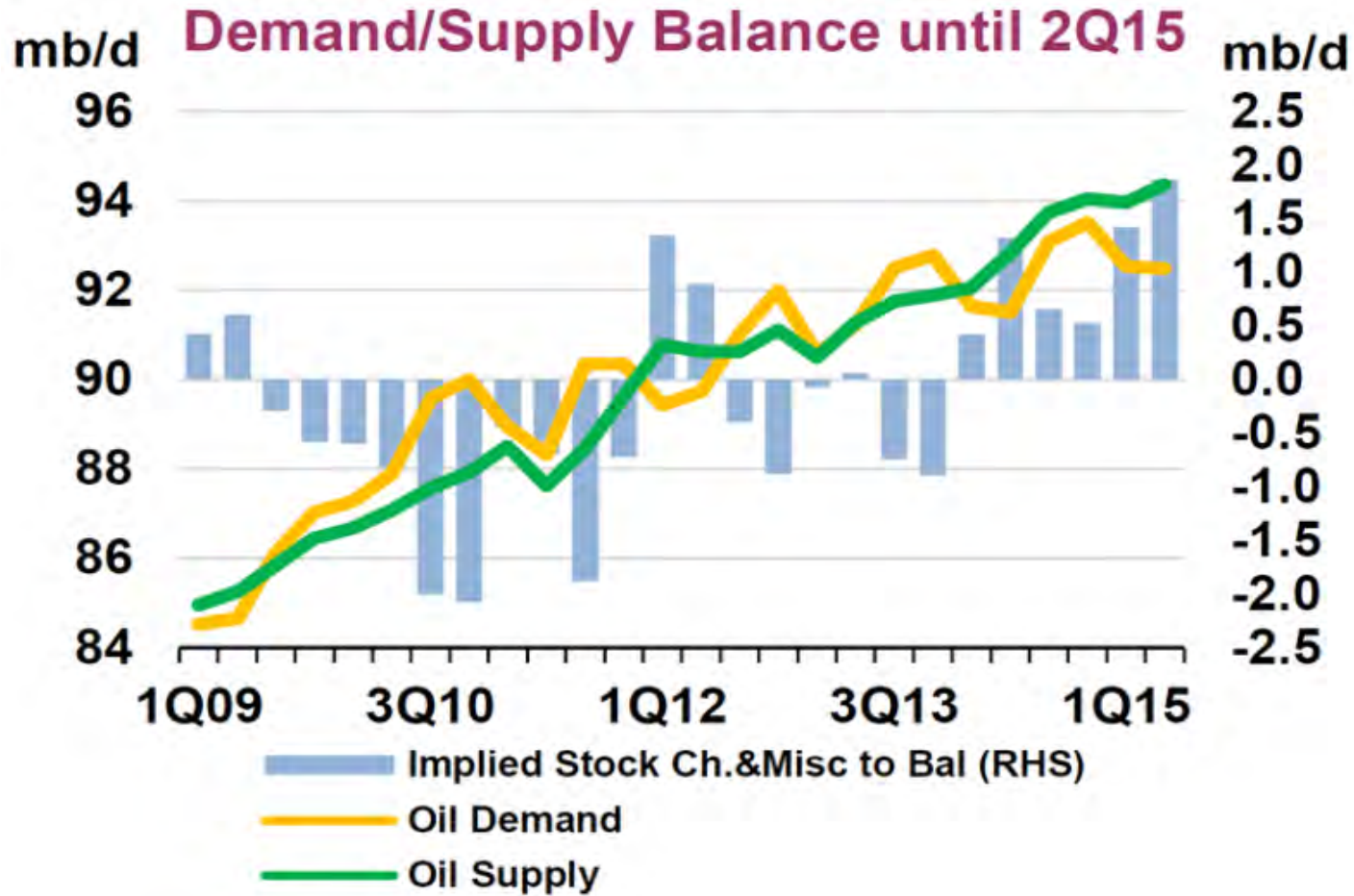
million barrels per day



Source: U.S. Energy Information Administration, based on Association of American Railroads



An Oil Glut Emerges



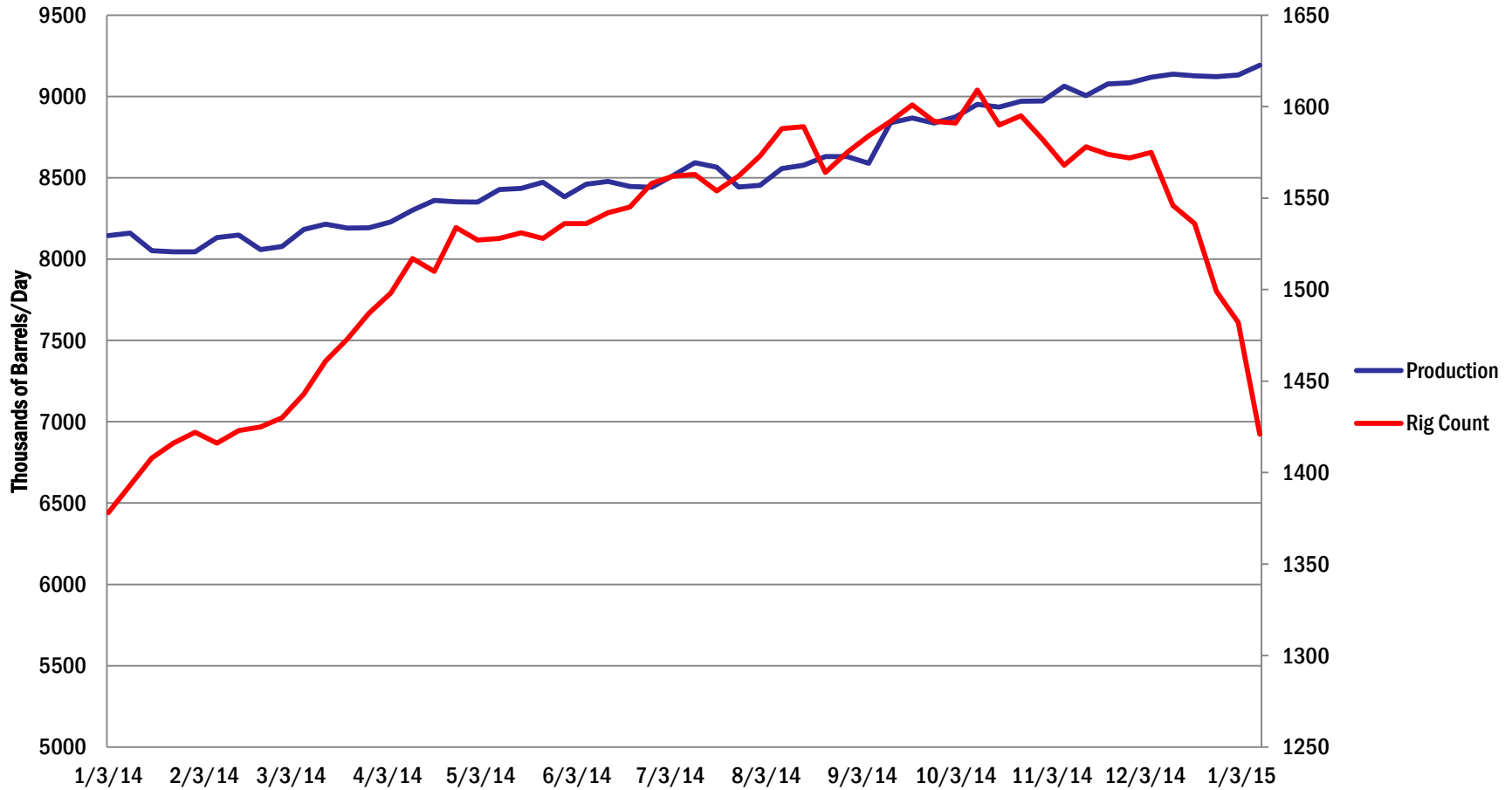


Impacts of Declining Crude Prices

- **4000% Growth from 2008 to 2014**
 - 9500 carloads to 435,600 carloads
 - 4.3 mmbbl/day to 87.4 mmbbl/day
- **Rig Count Has Dropped 11%**
 - 14% in the Williston Basin (Bakken)
- **Production Still Increasing – Lag Time**

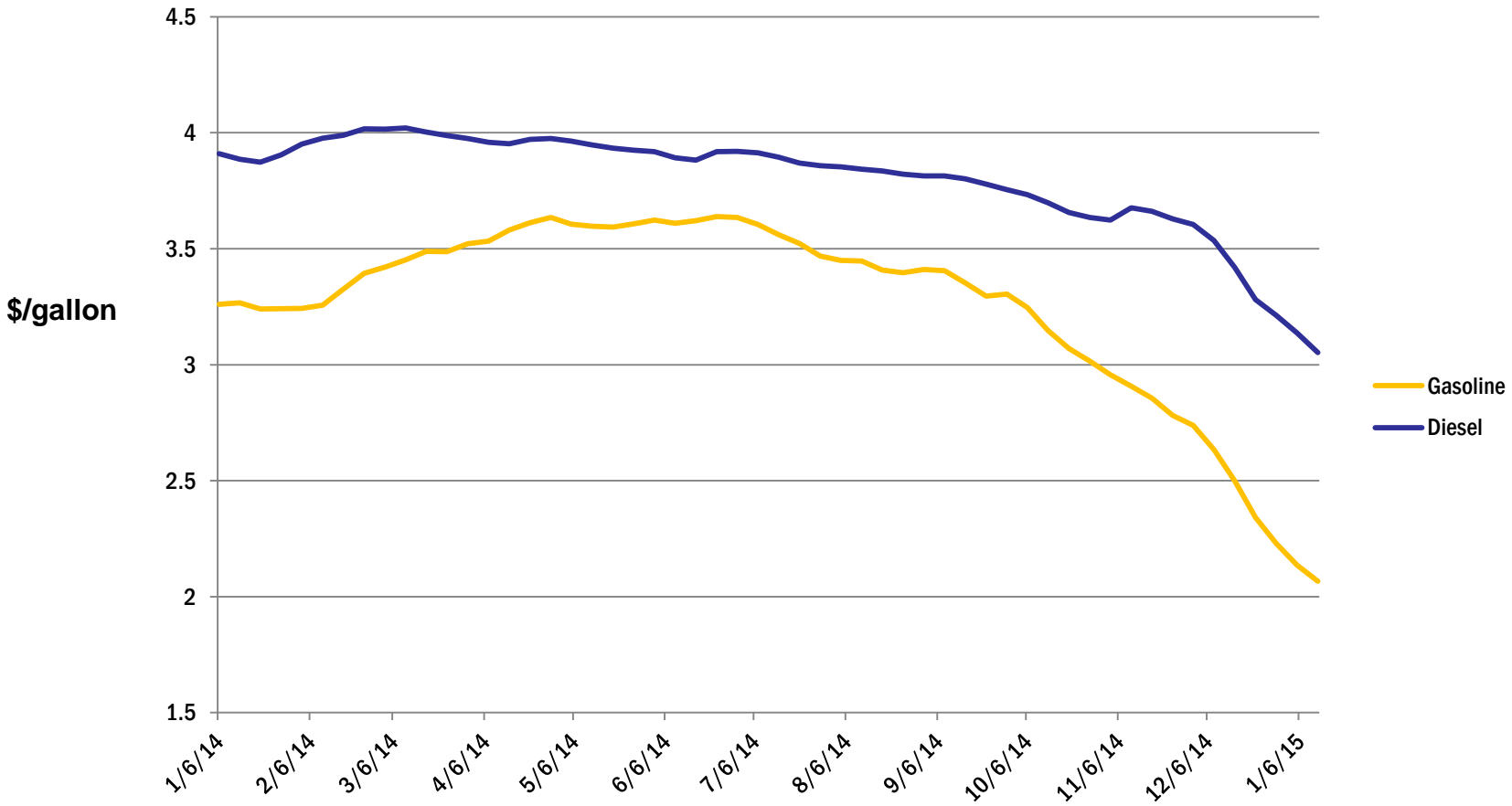


How Long is the Lag?



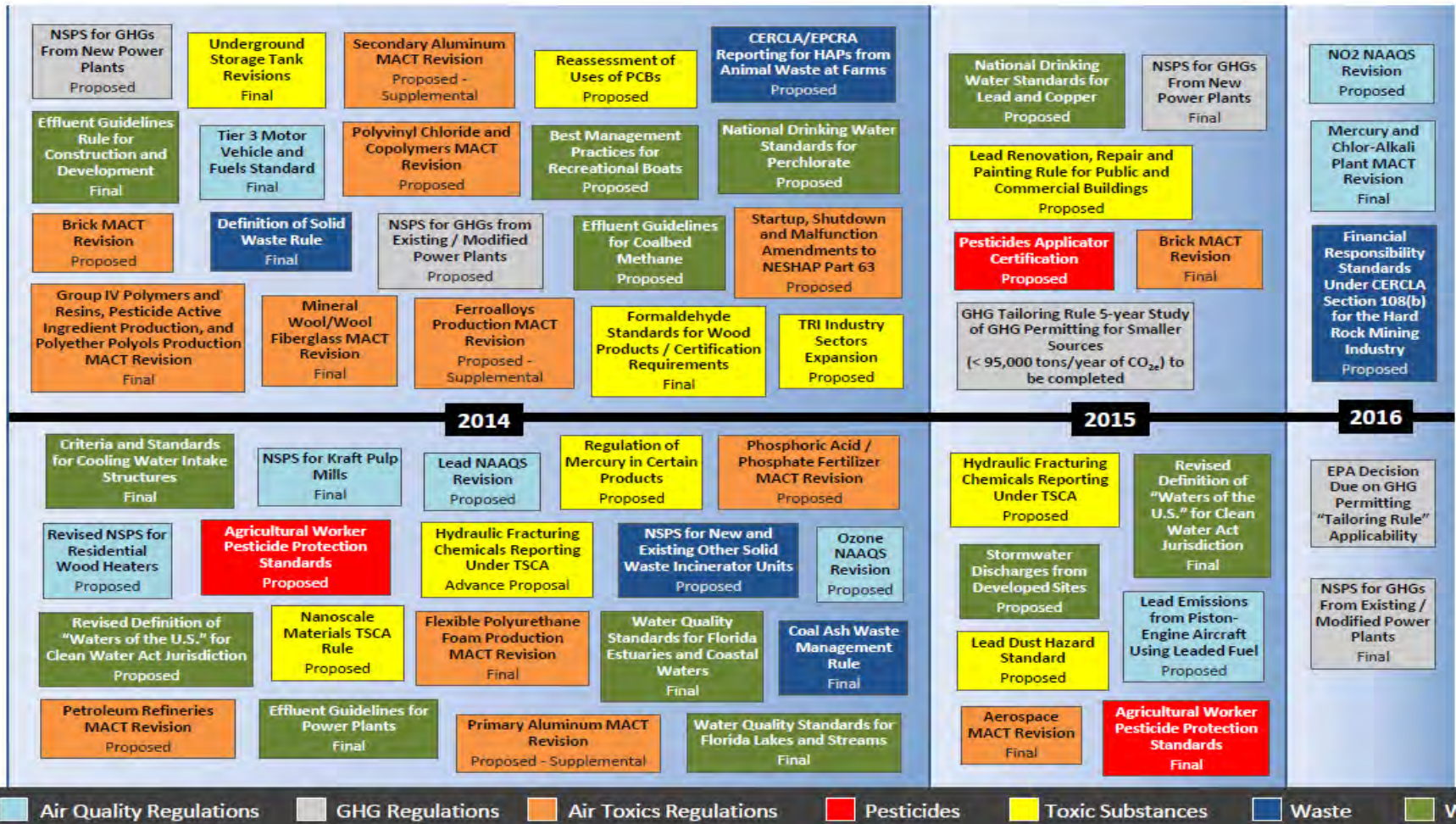


Fuel Prices Dropping Fast





EPA Rulemakings on the Runway



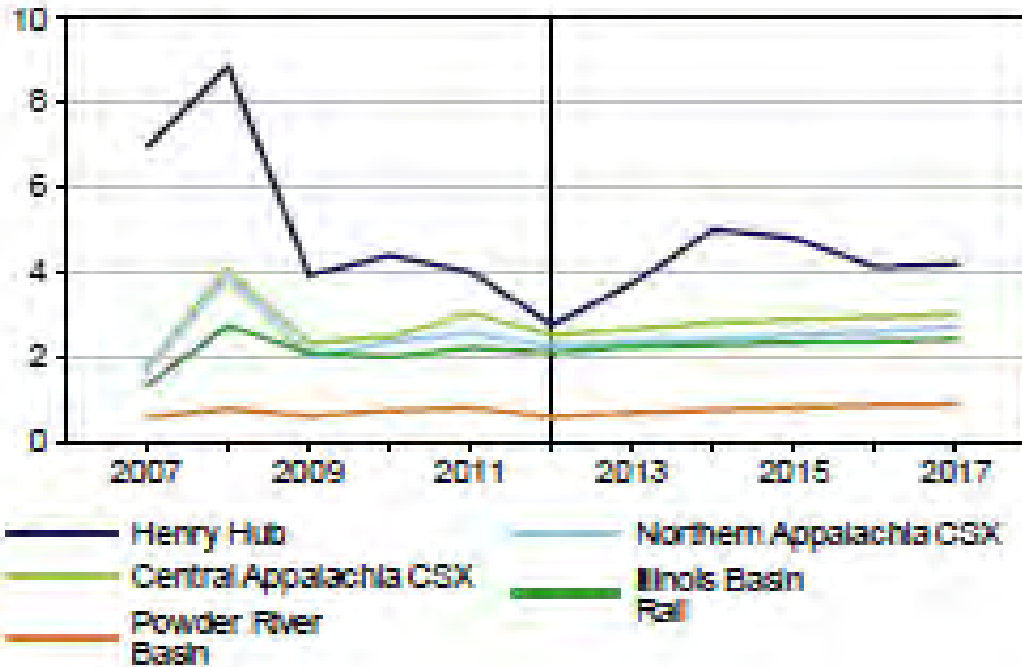
■ Air Quality Regulations
 ■ GHG Regulations
 ■ Air Toxics Regulations
 ■ Pesticides
 ■ Toxic Substances
 ■ Waste
 ■ Water



Coal & Gas Prices

Annual Henry Hub and Spot Coal Prices

\$US per MMBtu

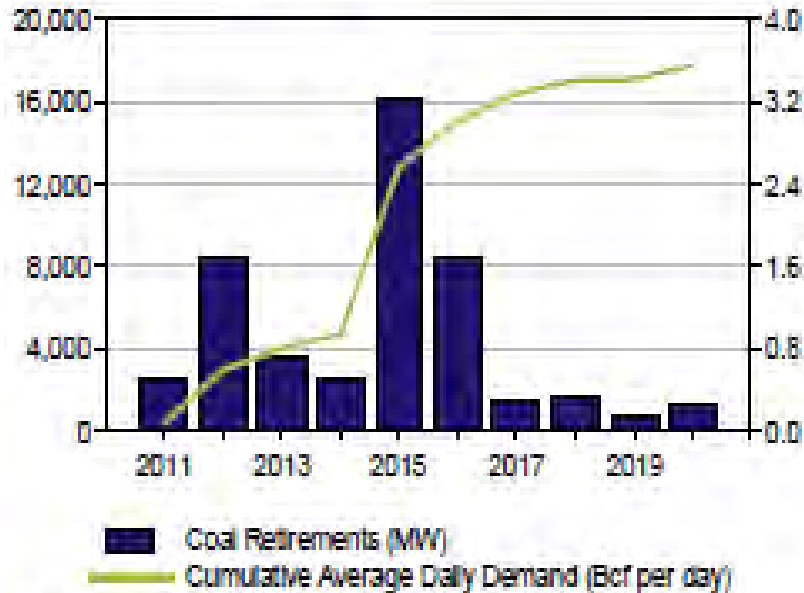


Source: IHS Energy



Expected Coal Plant Closures

US Coal Retirements and Implications for Natural Gas Demand



Note: Gas demand is relative to 2011 coal-fired generation

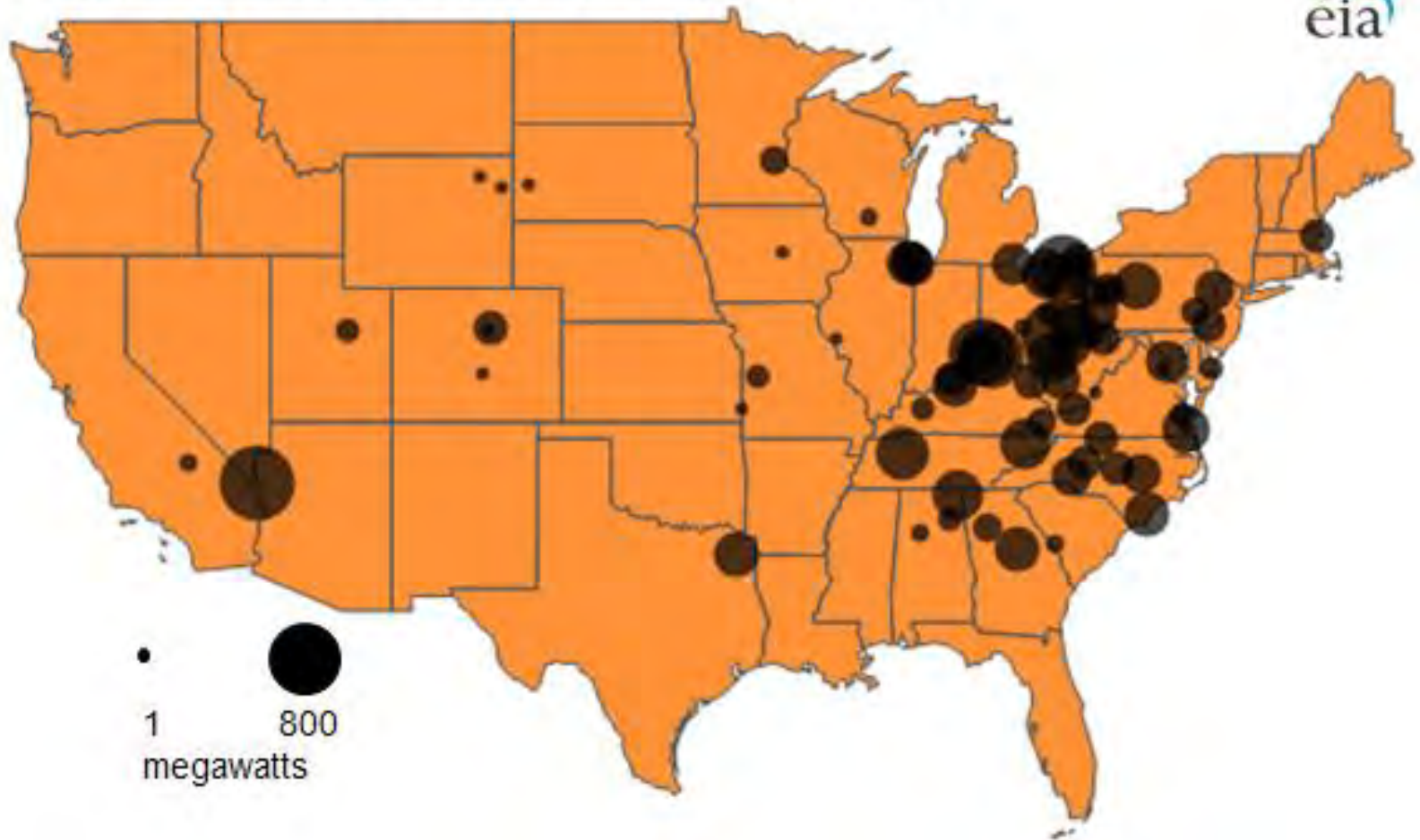
Source: IHS Energy

- **>50 GW prematurely retired by 2020**
- **15%-20% of entire coal fleet**
- **~10% of all US generation**



Heavy Concentration on Retirements

Reported Coal-fired generator retirements, 2012 - 2016





Still To Come

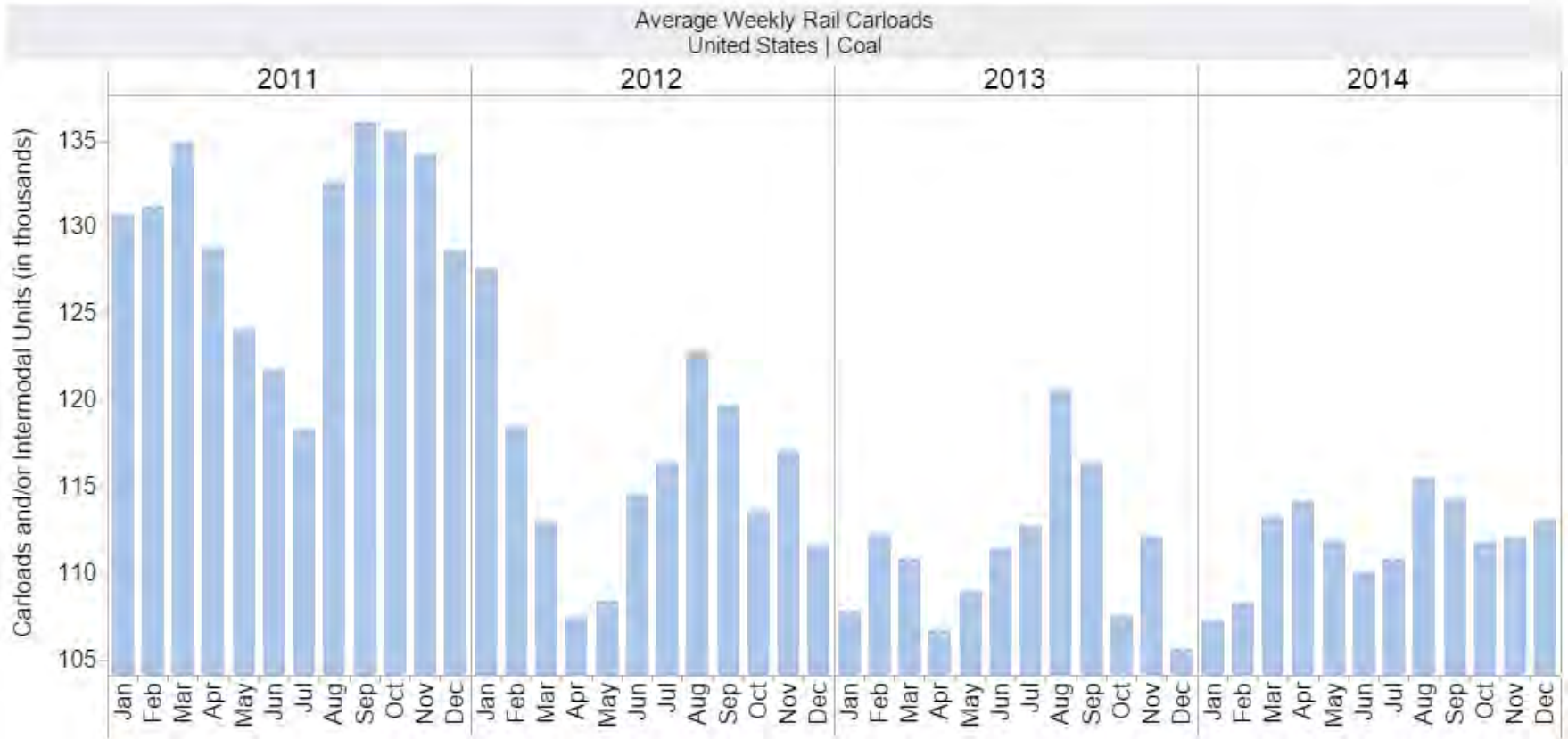
- **New Ozone Standards**
 - “Most Expensive Rule in History”

- **Climate Action Plan (CO₂)**
 - Series to “ratcheting” rule over decades
 - End is predictable: no coal or gas electricity
 - All Pain, No Measureable Impacts

- **Commonalities**
 - Manufacturing renaissance short lived?
 - No technological roadmap/leadership



Coal by Rail Decline Continues



*Canada - Figures for Canada include the U.S. operations of Canadian railroads.
**United States - Figures for the U.S. excludes the U.S. operations for Canadian railroads.





THANK YOU!

**Join us and help secure
America's Energy Future**

www.energyxxi.org

 **Institute for 21st Century Energy**

 **@Energy21**