



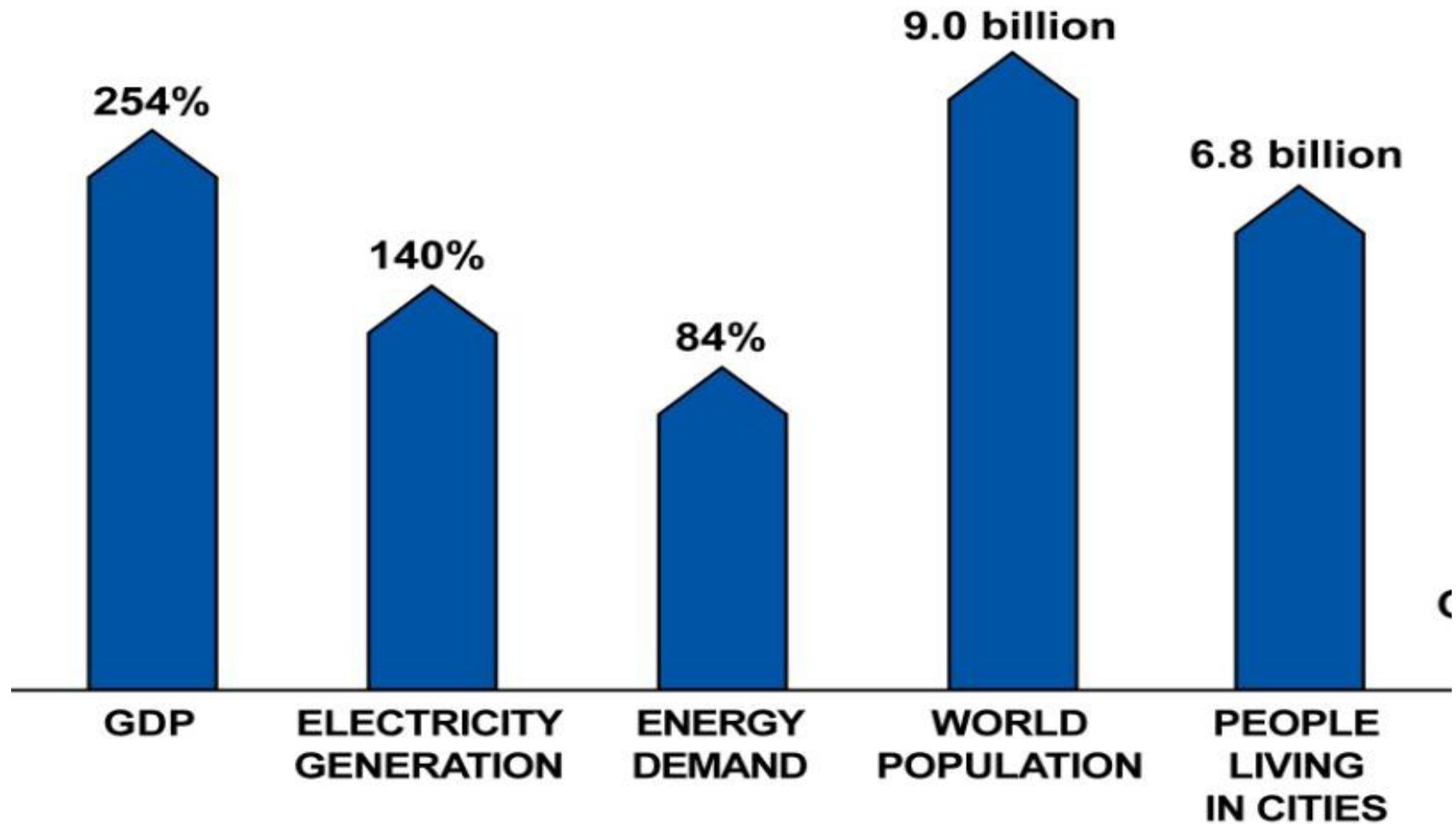
Karen A. Harbert
Institute for 21st Century Energy
U.S. Chamber of Commerce



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Monumental Changes by 2050





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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%**

**1.6 billion people without
electricity**

**\$38 trillion of new investment by
2035 to meet rising demand**



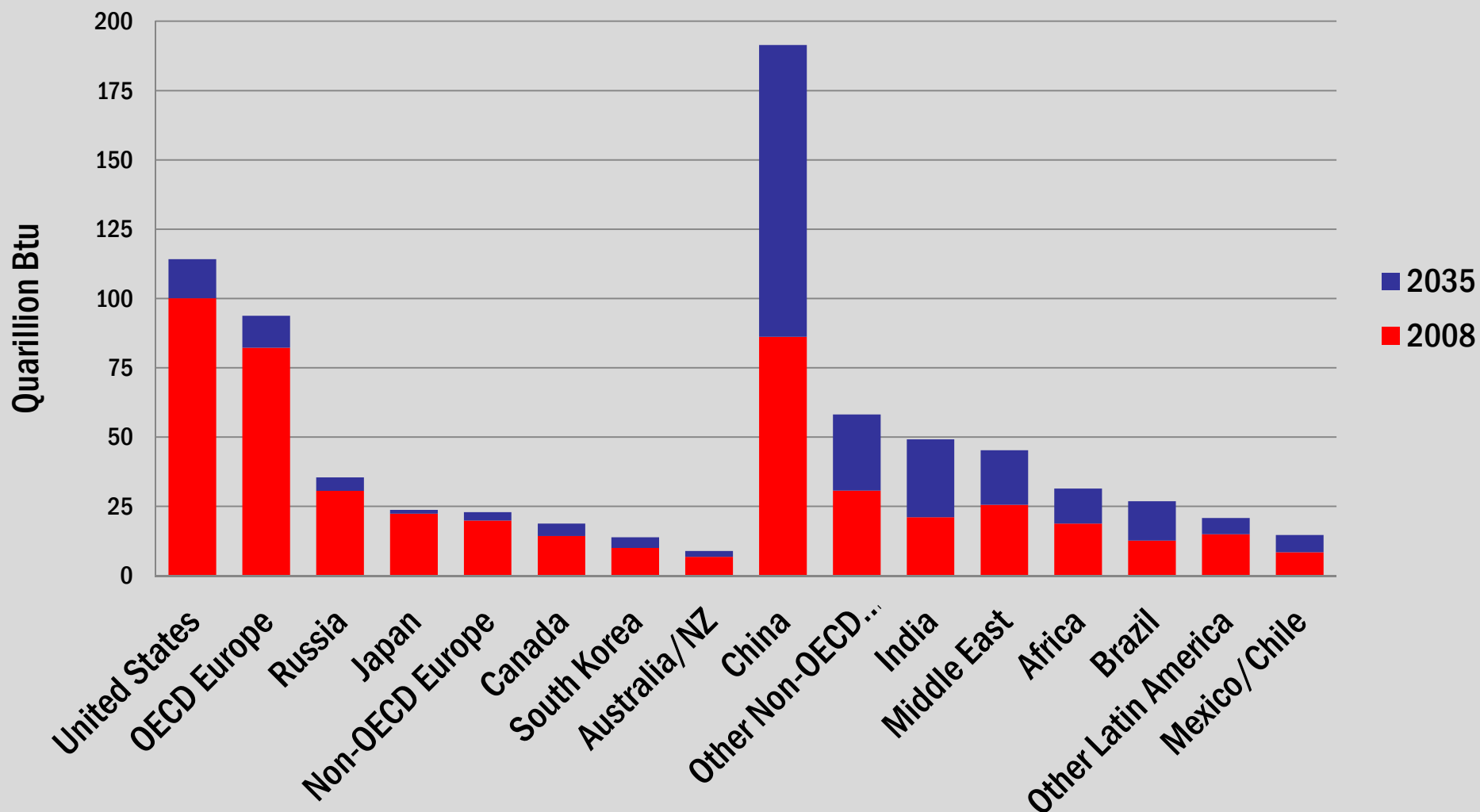


An Inconvenient Energy Truth

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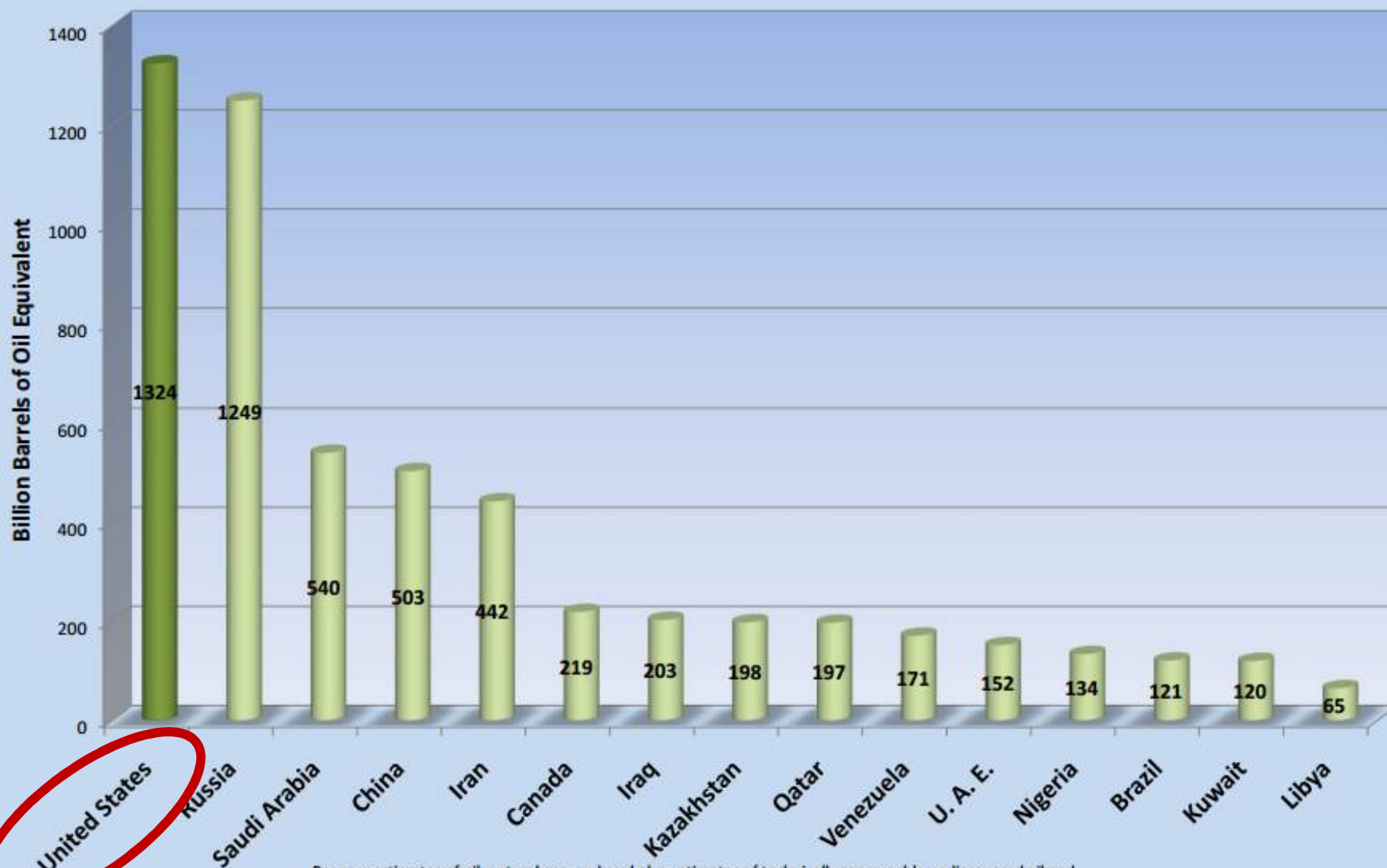


Global Energy Demand by Region: 2008 & 2035



World Fossil Fuel Resources

America Leads in Recoverable Fossil Fuel Supplies



Reserve estimates of oil, natural gas, and coal plus estimates of technically recoverable undiscovered oil and natural gas stated in barrels of oil equivalent. -- Source CRS

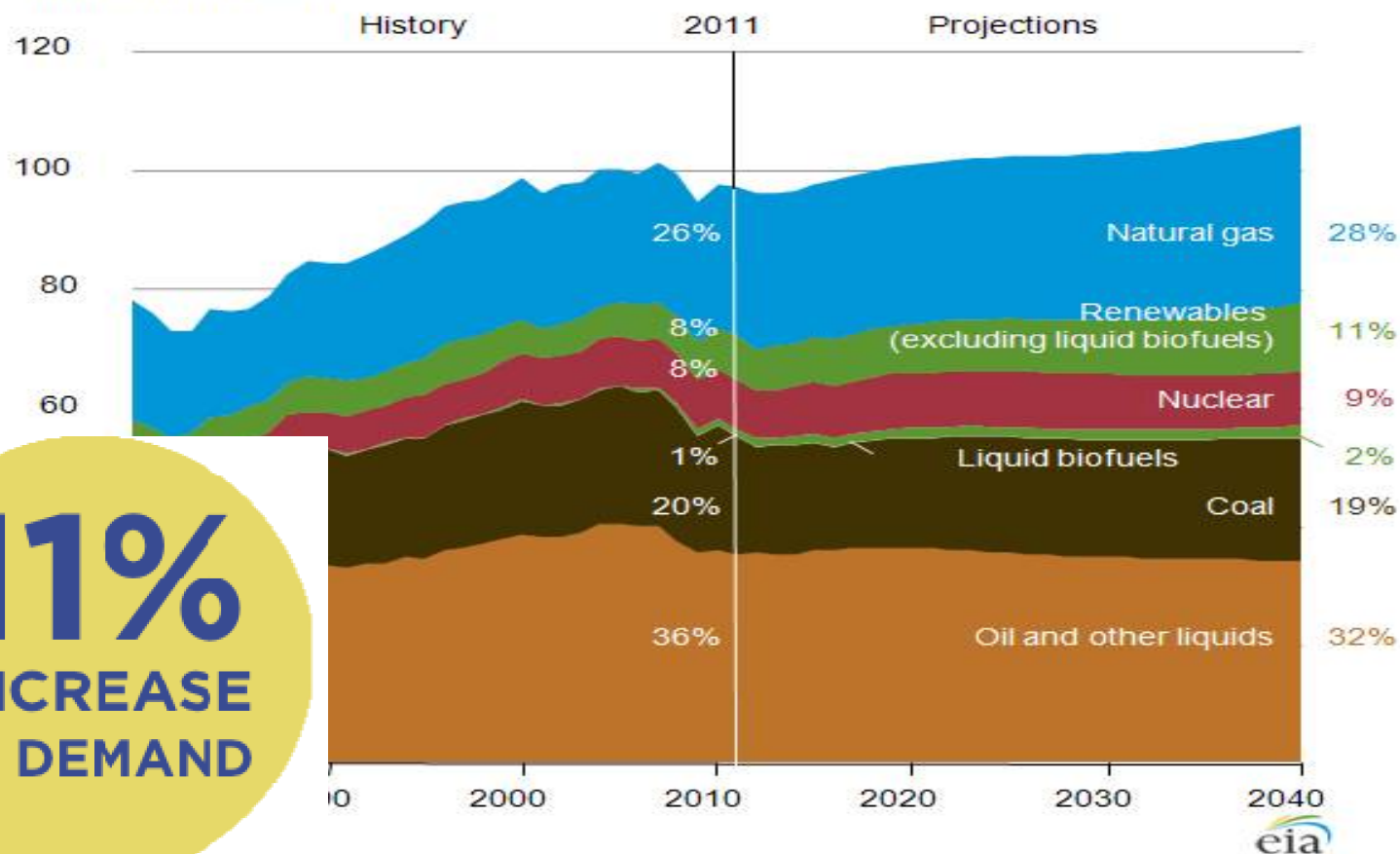


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Future Energy Demand

Figure 7. U.S. primary energy consumption by fuel, 1980-2040
quadrillion Btu per year







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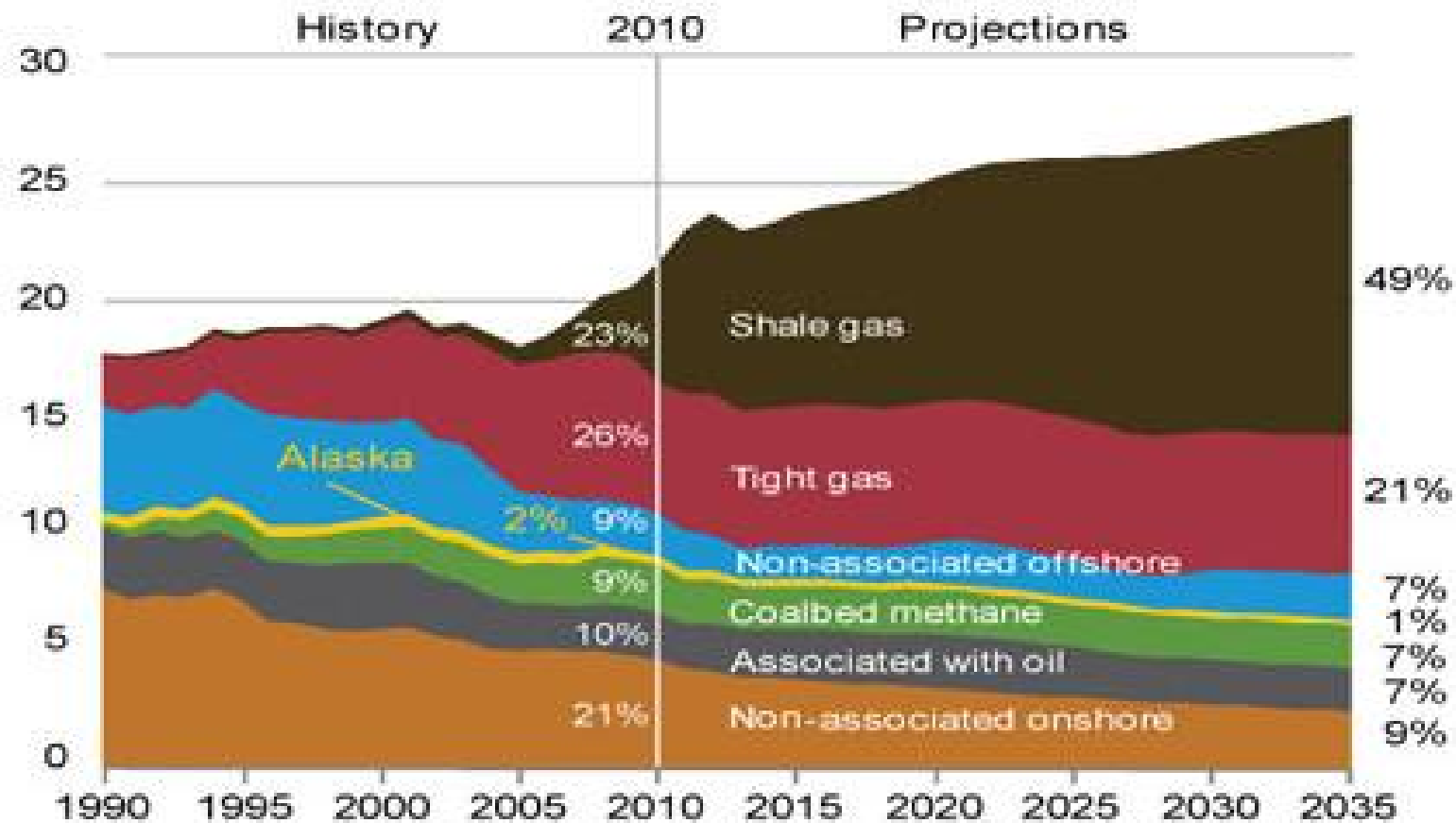
Top 10 Oil Producing States

Rank	State	Production (1000 Barrels per Day)
1	Texas	1,997
2	North Dakota	663
3	California	536
4	Alaska	526
5	Oklahoma	244
6	New Mexico	232
7	Louisiana	193
8	Wyoming	158
9	Colorado	135
10	Kansas	119



U.S. Natural Gas Production, 1990-2035

trillion cubic feet



Source: U.S. Energy Information Administration, AEO2012 Early Release Overview, January 23, 2012.



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



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Fueling Our Economy

By 2035, U.S. unconventional oil and natural gas could generate more than:

- More than 4 million new jobs;
- \$2.5 trillion in additional revenue;
- \$5.1 trillion in investment
- and 10 million barrels worth of added daily oil and natural gas production

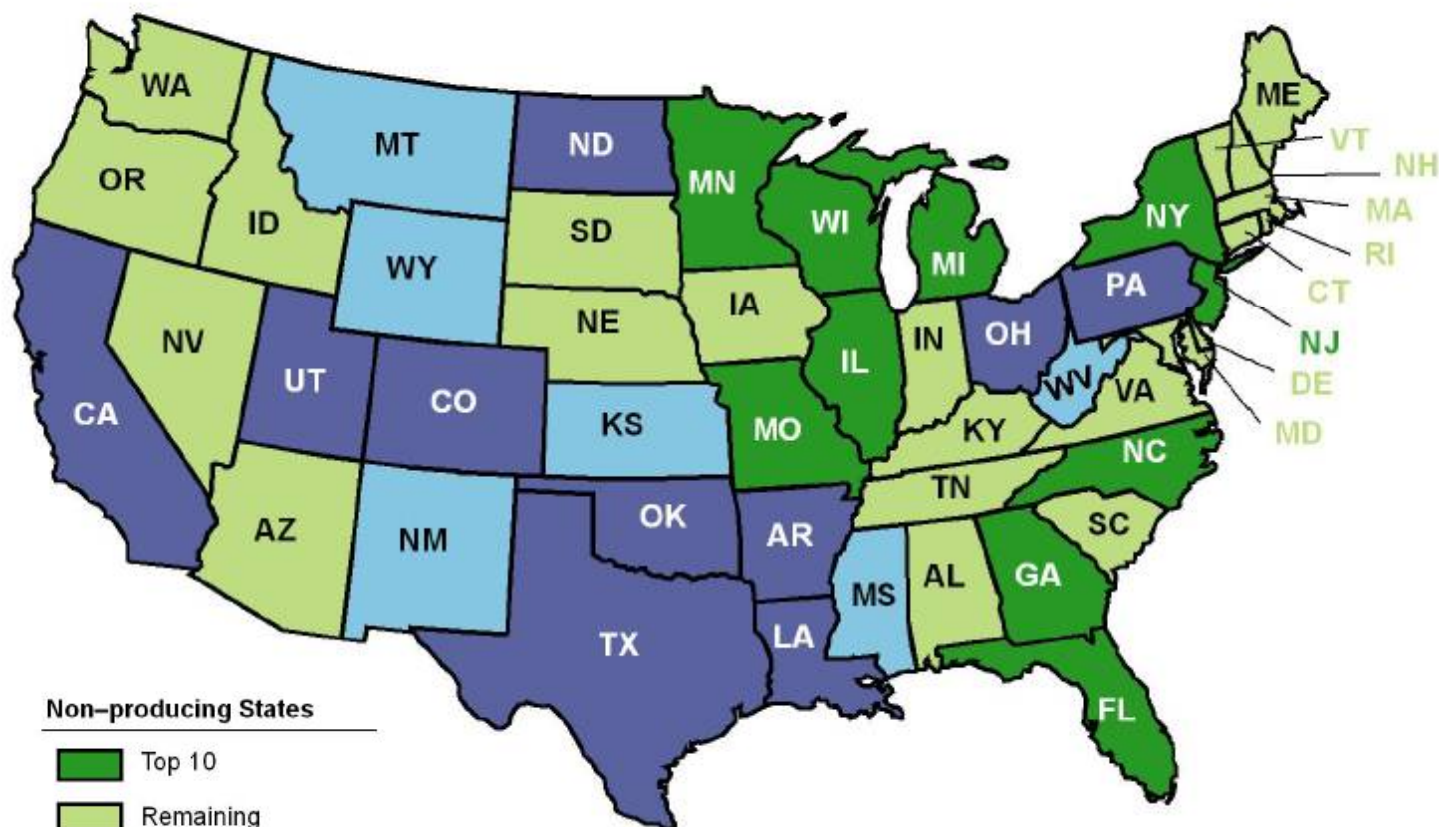


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America's New Energy Future

Employment Contribution of Unconventional Oil and Gas Is Far Reaching (Based on 2012 employment)



Source: IHS Global Insight.
21104-5



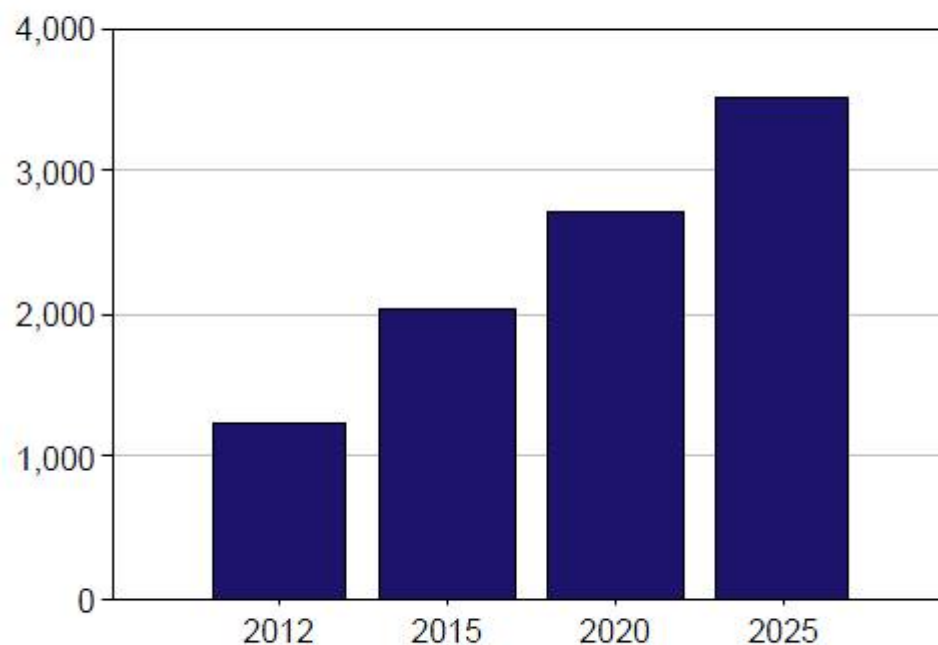
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America's New Energy Future

Change in Disposable Income per Household due to the Unconventional Activity Value Chain: Base Case*

2012 \$



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

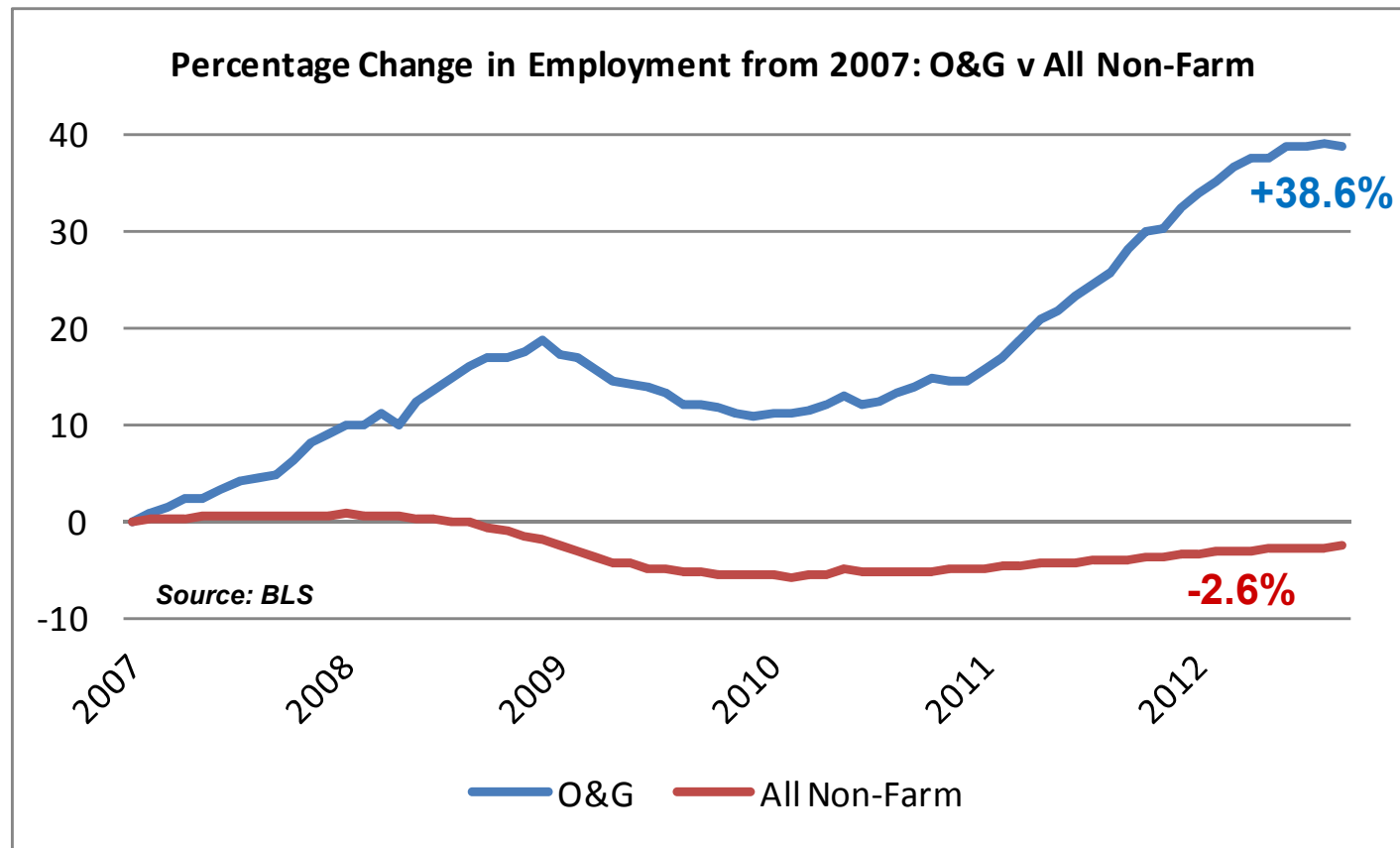
Source: IHS Model of the US Economy



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Oil & Gas is THE Job Driver



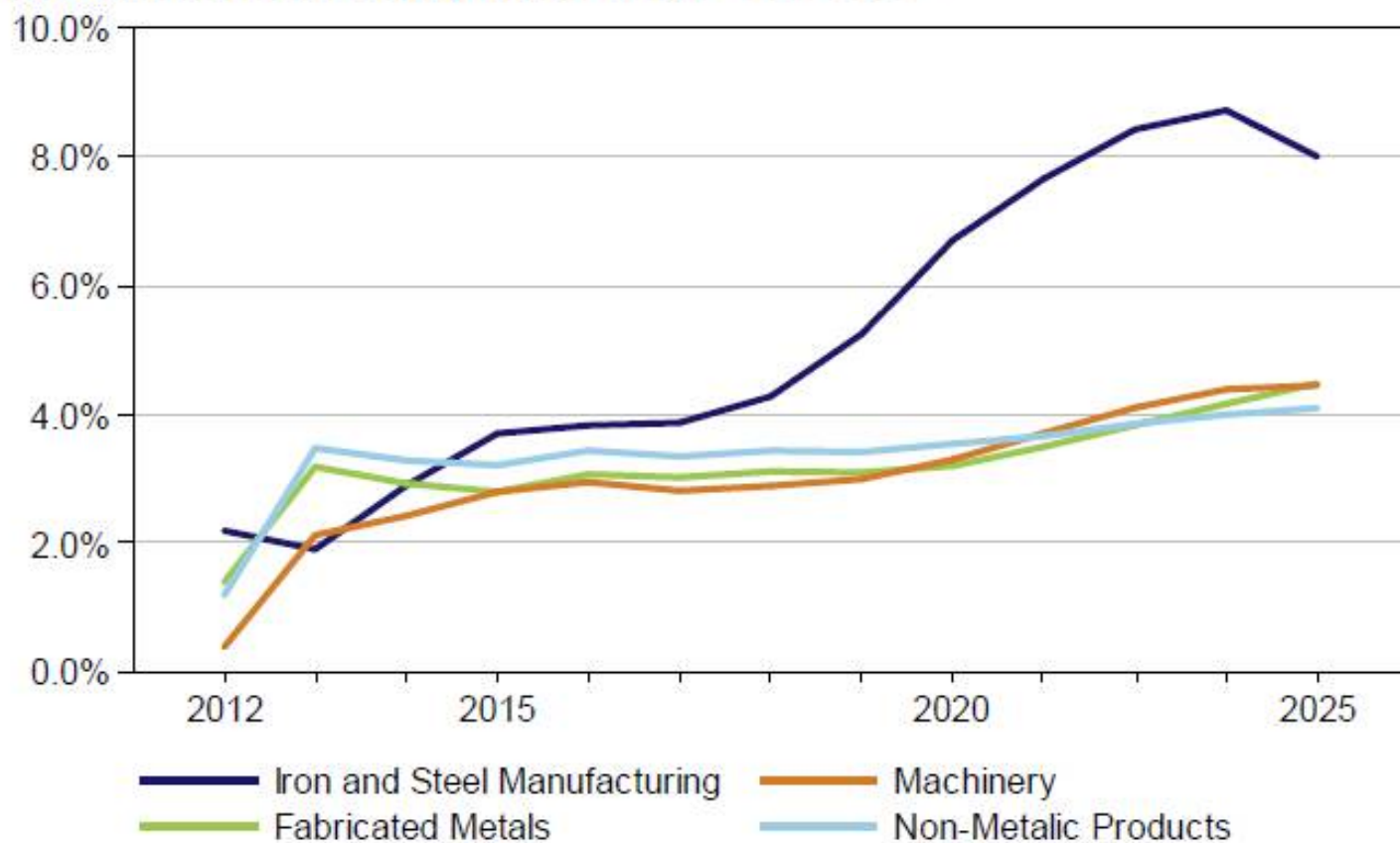


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Renaissance Is Broad

Change in Selected Durable Industrial Production Indices due to the Unconventional Activity Value Chain: Base Case*



IHS, ANEF 2013



U. S. C h a m b e r o f C o m m e r c e

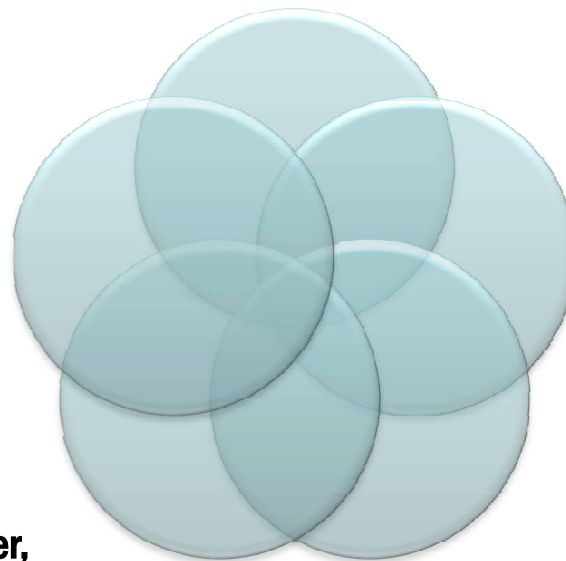


Fueling Our Economy

**Oil & Gas sector
created 9% of all
American jobs in 2011**

**Change the
Geopolitical Balance
in US favor**

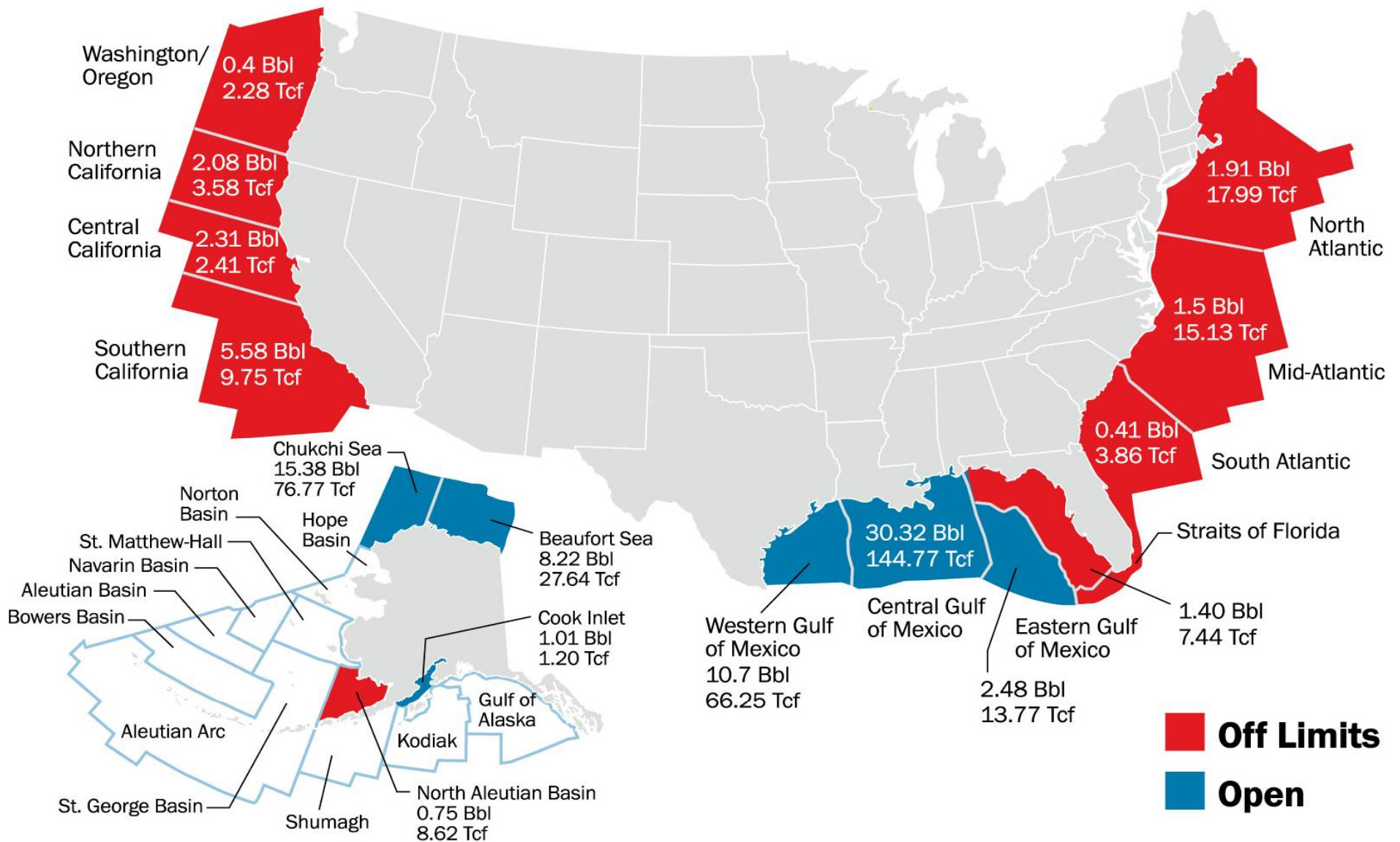
**Return of the
Chemical, Fertilizer,
Steel Industries**



**Oil imports expected
to decrease 60% in
2020...reducing
America's import bill
by \$200B by 2020.**

**Manufacturing
Renaissance**

Offshore Undiscovered Technically Recoverable Federal Oil and Natural Gas Resources



Source: MMS and Department of the Interior

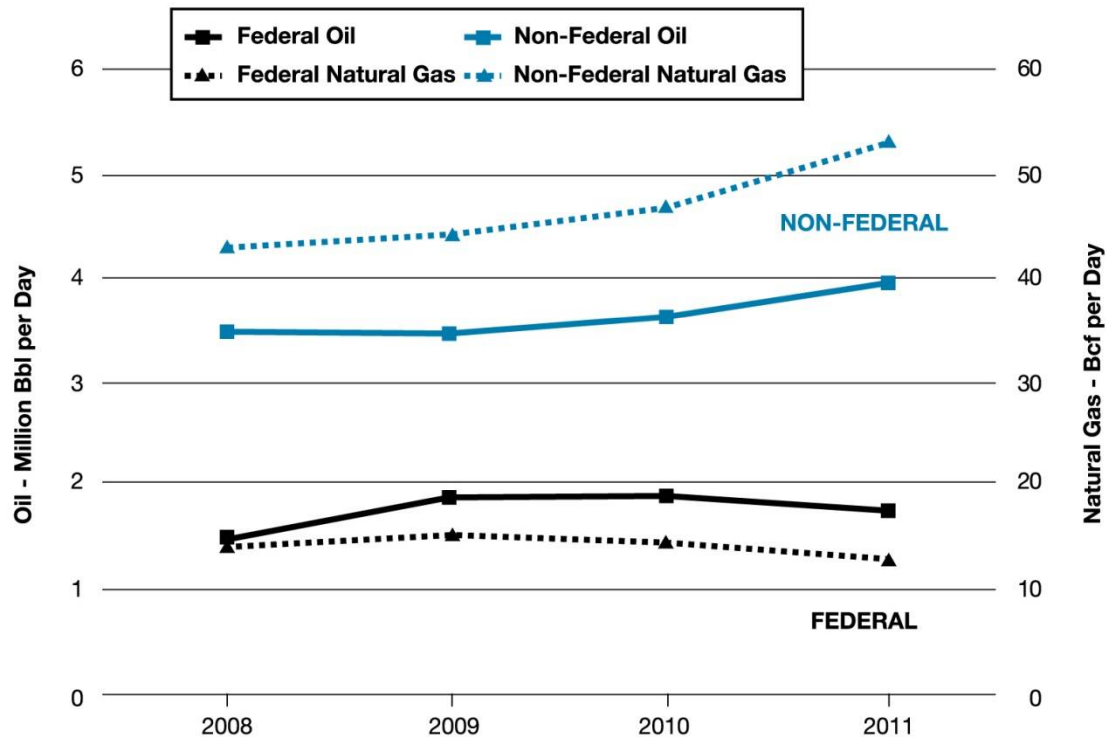


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Where the Action IS and ISN'T

U.S. Oil and Natural Gas Production on Federal vs. Non-federal Lands and Waters



Source: EIA, Office of Natural Resource Revenue

All oil
increase on
private and
state lands;
7% decrease

Gas down
33% on fed
lands and up
44% on state
lands





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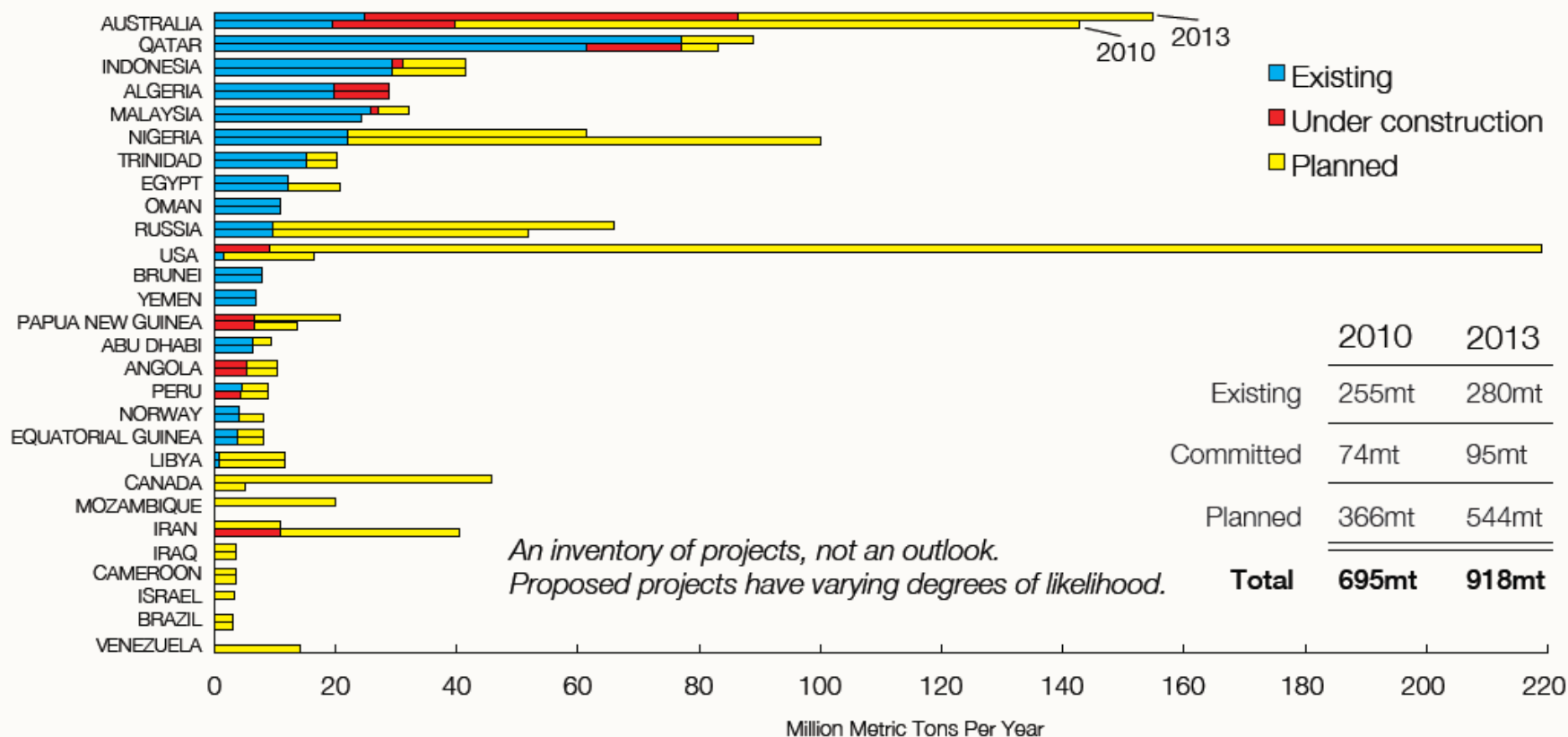
Getting back in the Infrastructure Business





Global Race to Export is On

Liquefaction Comparison



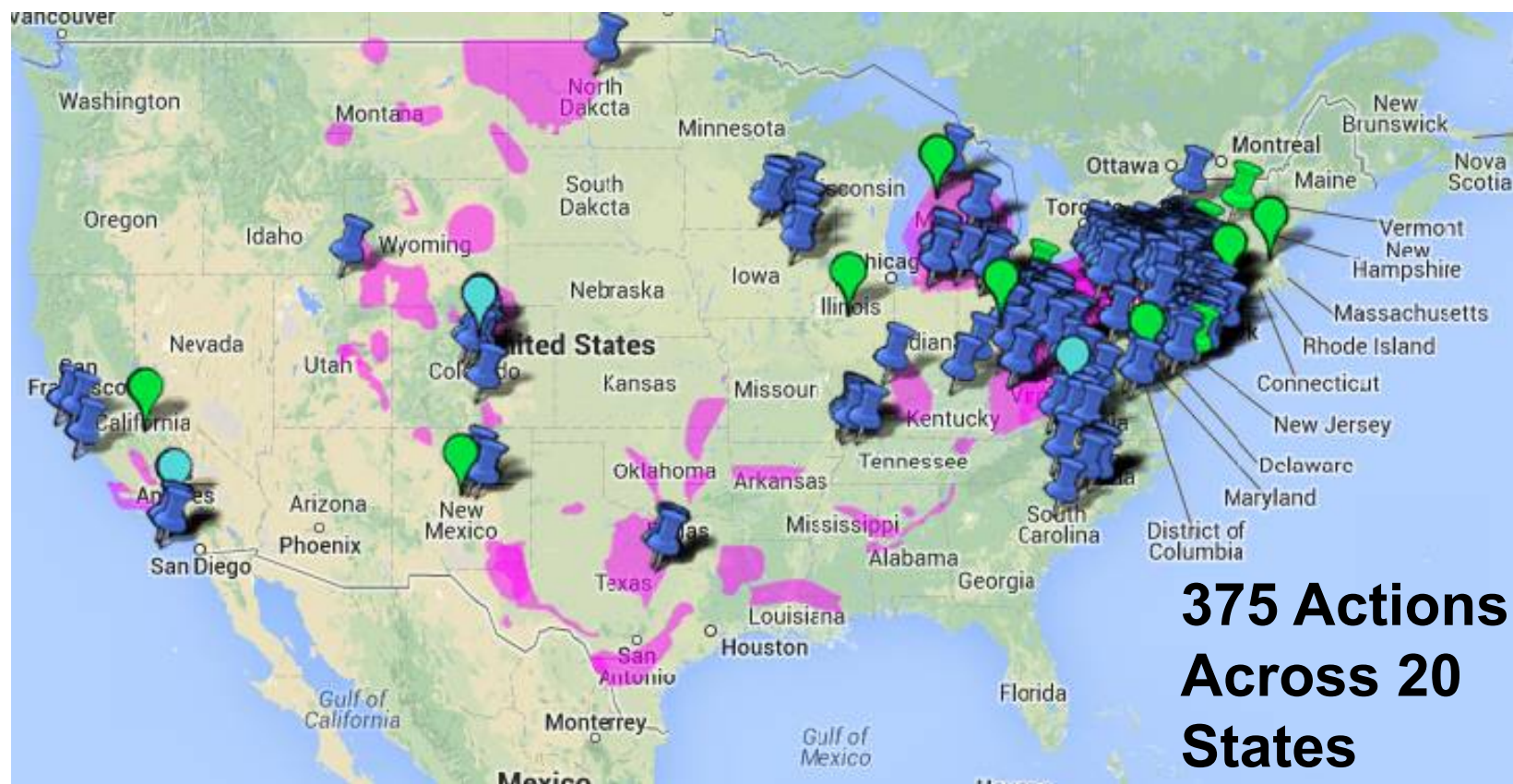
IHS, LNG and the New Map of Global Gas, 2013



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A Bright Future is NOT a Given



State Measures (Passed)



State Measures (Pending)



Local Measures (Passed)

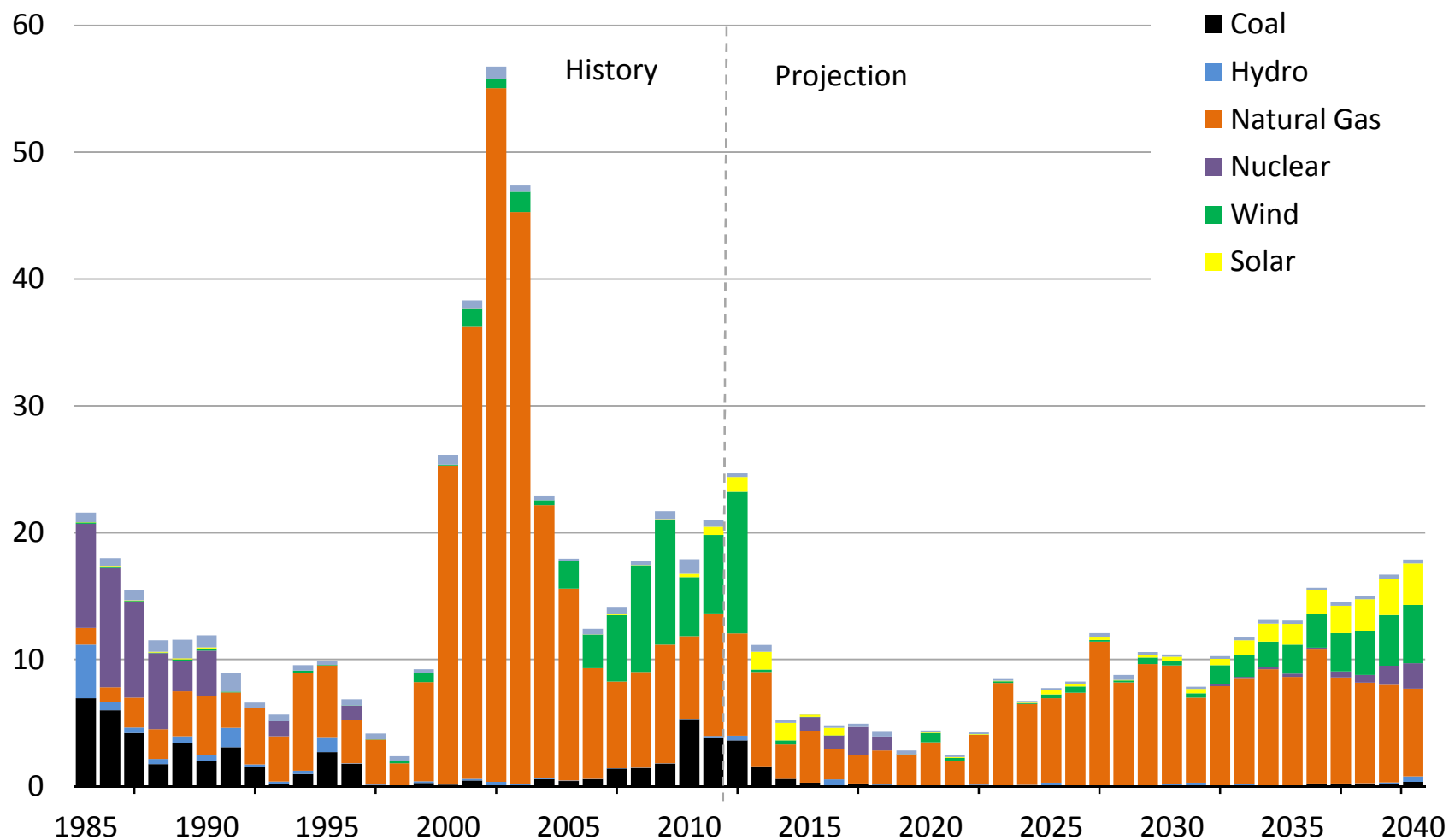


Local Measures (Pending)



Shale Plays

Additions to electricity generation capacity 1985-2040



Progress of Regulatory Rules

2011

- Revised Stormwater Regulation (Post Construction) NPRM 11/11
- Boiler MACT Reconsideration NPRM 12/11
- Petroleum Refineries - Heat Exchangers NESHAP Reconsideration Final rule 11/11
- Clean Water Protection Rule NPRM 1/12
- Oil & Natural Gas Sector NESHAP/NSPS Final rule 3/12
- Steam Electric Power Efficient Standards NPRM 7/12
- CERCLA Section 108(b) Requirements for Hard Rock Mining NPRM 3/12
- Gas Turbines HAP Petition to Delist Final rule 11/12
- Lead Dust Hazard Standards NPRM 3/13
- Human Subjects Rule Revisions Final rule 12/11
- 2017-2025 Light Duty Vehicle GHG/CAFE Standards NPRM 12/11
- Formaldehyde Emissions from Pressed Wood Products NPRM 2/12
- NOx and SOx Secondary NAAQS Review Final rule 4/12
- CERCLA/EPCRA Animal Waste Air Reporting Requirements NPRM 8/12
- TSCA Regulations on Long-Chain Perfluorinated Chemicals NPRM 1/13
- NPOWRs for Perchlorate NPRM 3/13
- TRI Reporting for Metal Mining Activities NPRM 12/11
- Utility MACT Final rule 12/11
- GHG Tailoring Rule - Step 3 NPRM 2/12
- Nitric Acid Plants NSPS Final rule 4/12
- Chesapeake Bay CAFO Rule NPRM 5/12
- Mercury Cell Chlor-Alkali MACT Final rule 9/12
- NPOWR Total Coliform Rule Final rule 11/12
- RCRA CO2 Sequestration Final rule 2/13
- Coalbed Methane Effluent Standards NPRM 6/13
- Secondary Aluminum Production NESHAP NPRM 12/11
- Nuclear Operations Radiation Protection Standard ANPRM 12/11
- Tier 3 Vehicle/Fuel Standards NPRM 2/12
- Particulate Matter NAAQS NPRM 6/12 Final rule 6/13
- Phosphoric Acid and Phosphate Fertilizer NESHAP NPRM 11/12
- Shale Gas Extraction Pretreatment Standards NPRM 10/14
- Mineral Wool and Wool Fiberglass NESHAP NPRM 11/11

2012

- Primary Aluminum Reduction NESHAP NPRM 11/11
- Petroleum Refinery NESHAP/NSPS NPRM 12/11
- NSPS & EG for CISWI - Reconsideration NPRM 12/11
- FL Numeric Nutrient Criteria - Estuaries and Coastal Waters NPRM 11/11; Final rule 8/12
- Secondary Lead Smelters NESHAP Final rule 12/11
- Polymers and Resins NESHAP NPRM 12/11
- NSPS Review for Residential Wood Heaters NPRM 1/12
- Operating Uranium Mill Tailings NESHAP NPRM 3/12
- Part 63 Malfunction Amendments NPRM 4/12
- Lead Paint Standards for Public and Commercial Buildings NPRM 6/12
- Agricultural Worker Protection Standard Revisions NPRM 7/12
- 1-Hour SO2 NAAQS Implementation NPRM 7/12
- CAFO Reporting Rule Final rule 7/12
- Chromium Electroplating/Steel Pickling NESHAP Supp. NPRM 1/12; Final rule 8/12
- NPOWRs for Lead and Copper NPRM 10/12
- Certification of Pesticide Applicators NPRM 10/12
- TRI Industry Sectors Expansion NPRM 12/12
- Mercury TSCA Section 6(a) Rule NPRM 10/12

2013

- Definition of Solid Waste Final rule 1/13
- PCB Use Authorizations NPRM 4/13
- Ozone NAAQS NPRM 7/13
- Lead NAAQS NPRM 12/13

2014

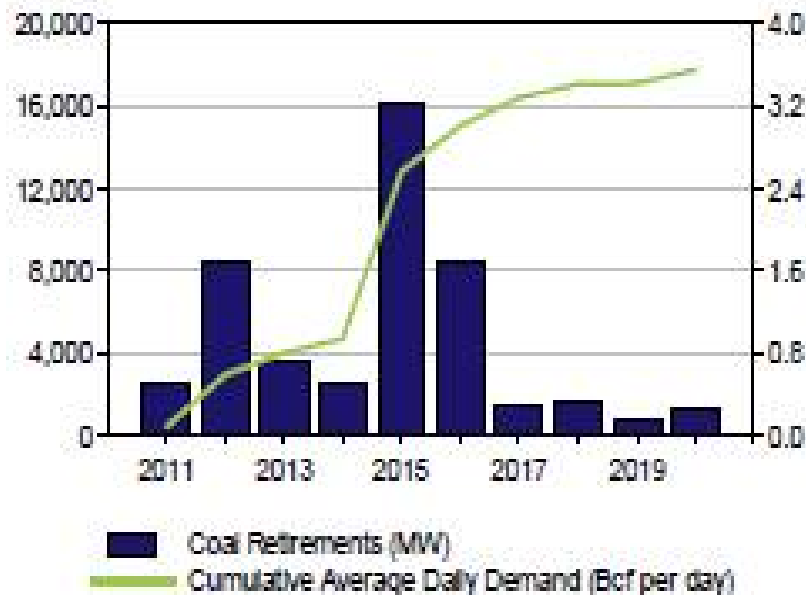
- Pre-Proposal Stage
- PM2.5 Implementation Rule Revision Pre-Proposal Stage
- Brick and Structural Clay and Clay Ceramics NESHAP Pre-proposal stage

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



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**

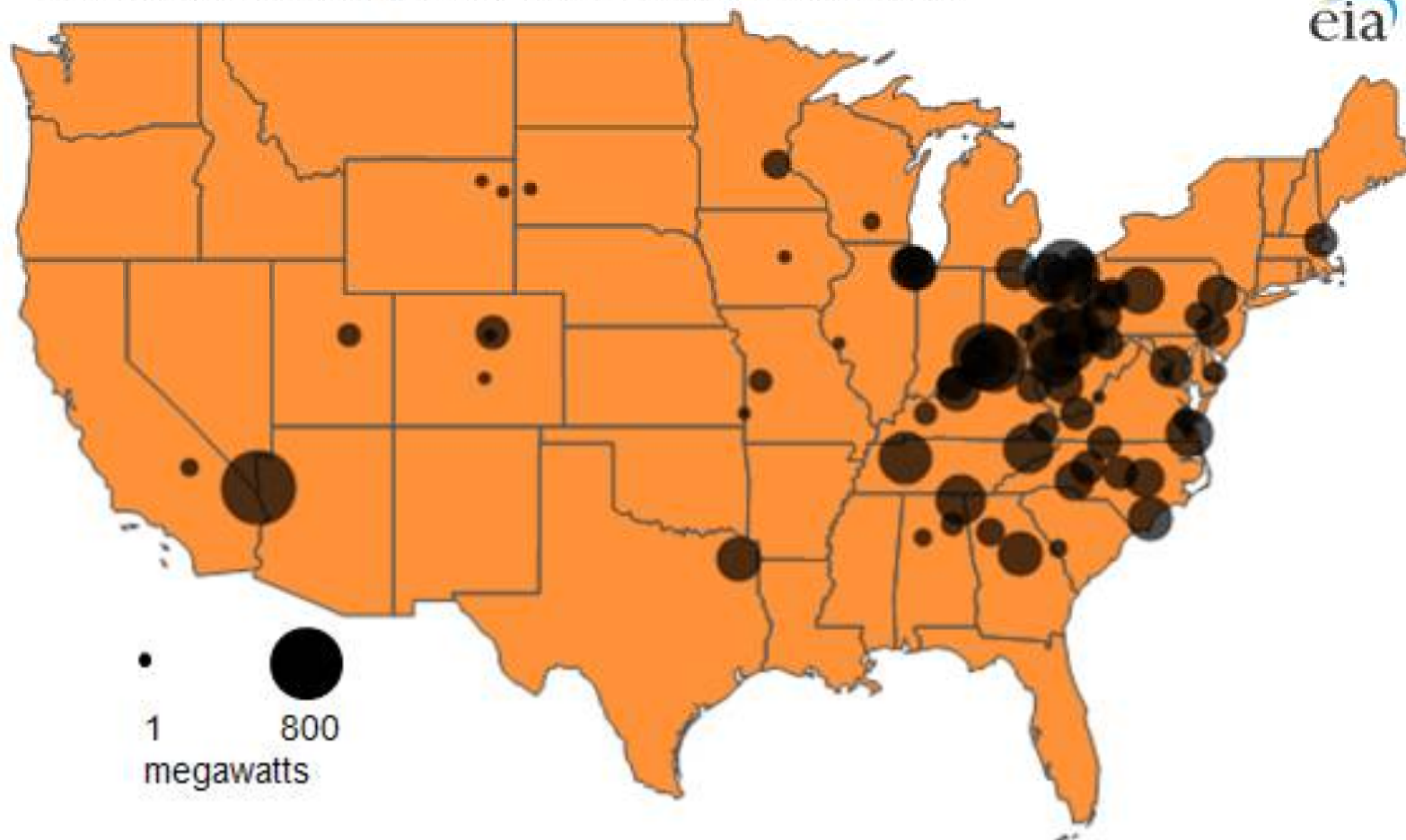


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Heavy Concentration on Retirements

Reported Coal-fired generator retirements, 2012 - 2016





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Time to Take Action

ON THE TABLE: America's national security,
investment climate and competitiveness

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