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Bureau of Economic Geology, The University of Texas at Austin



Energy in the U.S.

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Who We Are



THE UNIVERSITY OF TEXAS AT AUSTIN

JACKSON

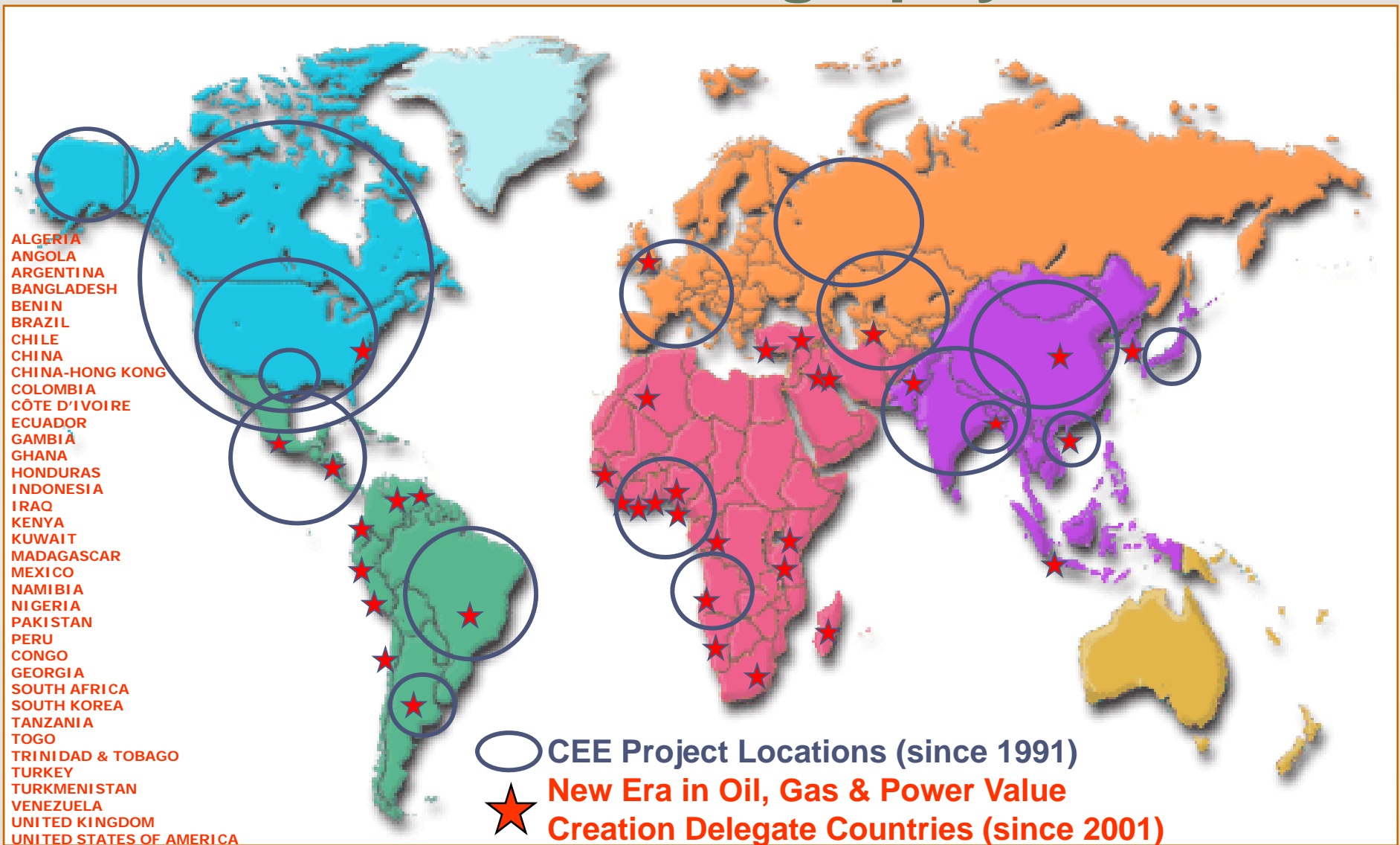
SCHOOL OF GEOSCIENCES

For more information:

<http://www.beg.utexas.edu/energyecon>



Our Geography and Reach



Regional Economy

- Oil & gas value chain is very important for Texas and Houston
- Texas is major exporter of oil, products and natural gas to rest of the U.S.
- Home to international companies
- Competition in electricity encourages new businesses (renewables, smart grid, etc) but still small share of the economy

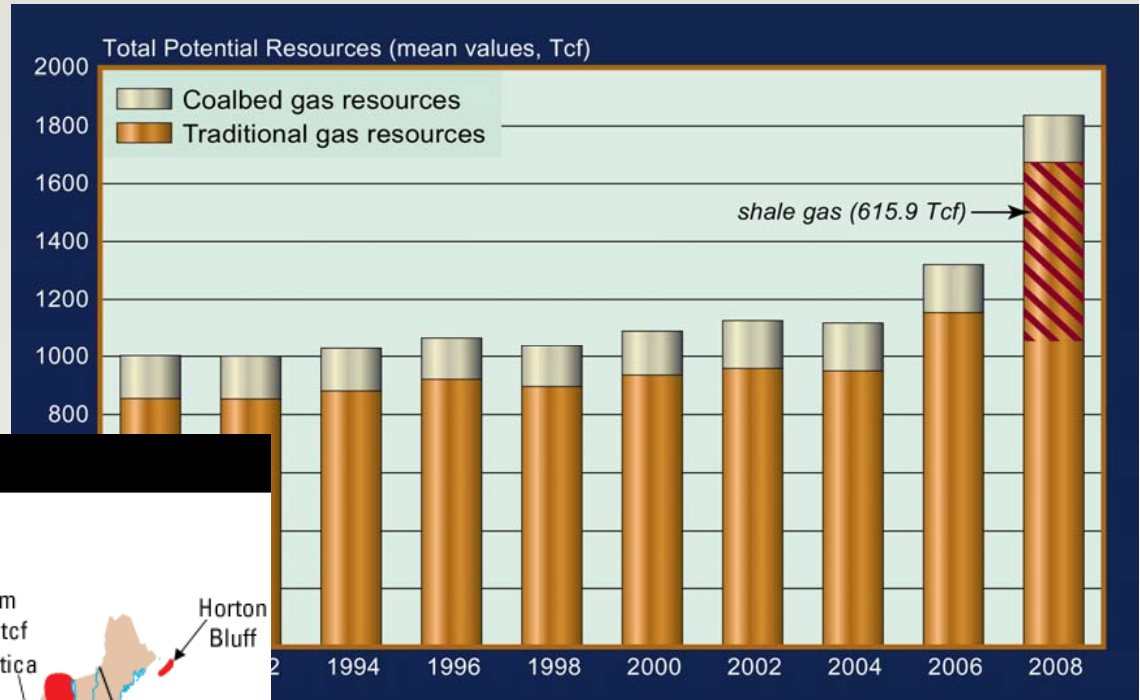
Unconventional story



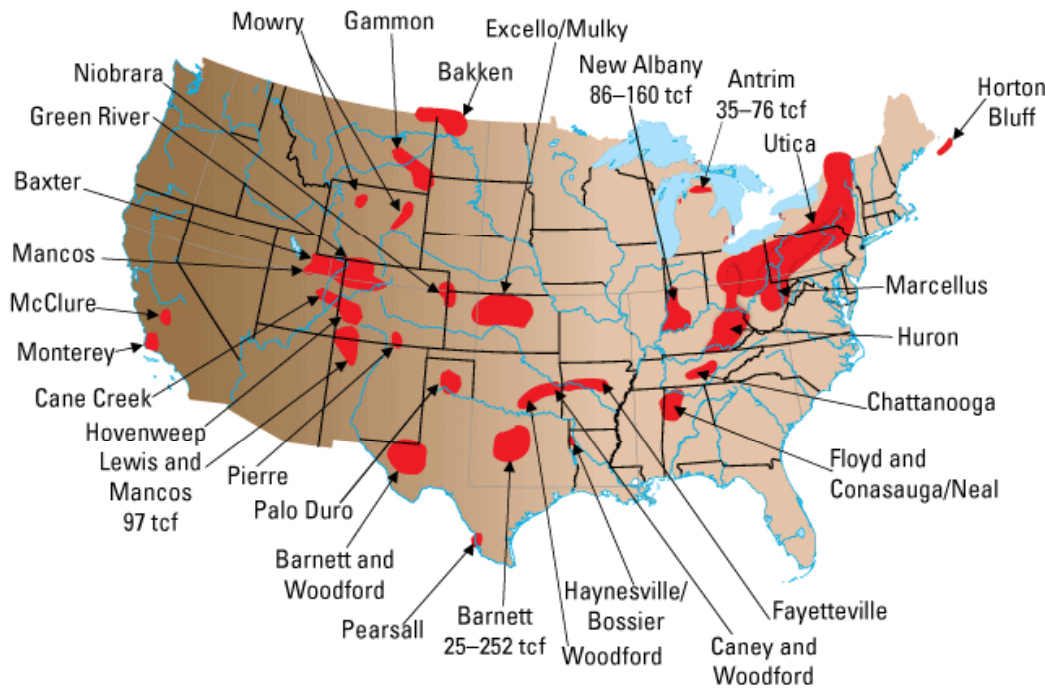
From Holditch, 2005, "Statistical Correlations in Tight Gas Sands", American Association of Petroleum Geologists (AAPG) Hedberg Conference Proceedings.

http://www.searchanddiscovery.net/documents/abstracts/2005hedberg_vail/abstracts/extended/holditch01/holditch01.htm

The US Shale Gas Resource

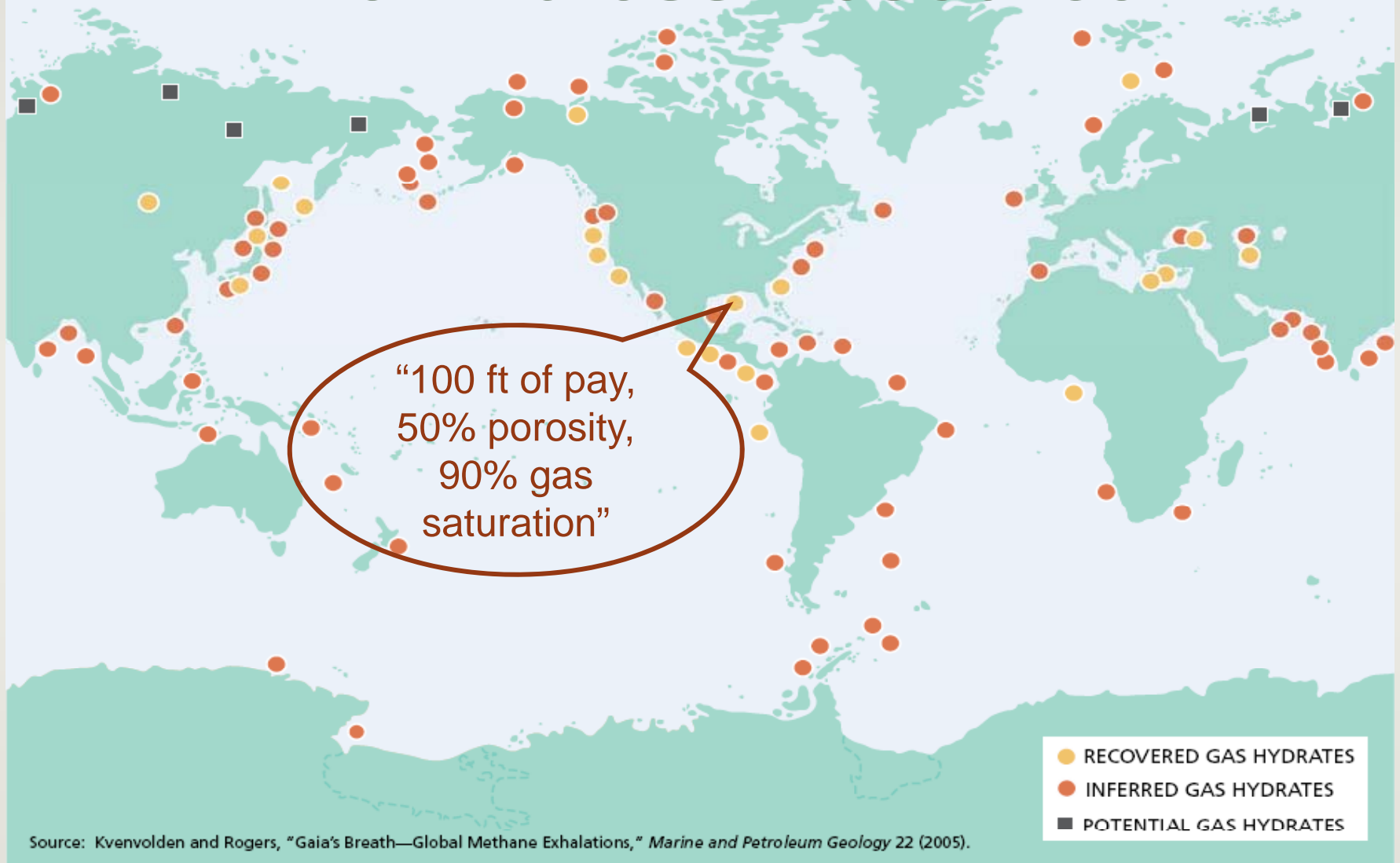


Major US shale basins.

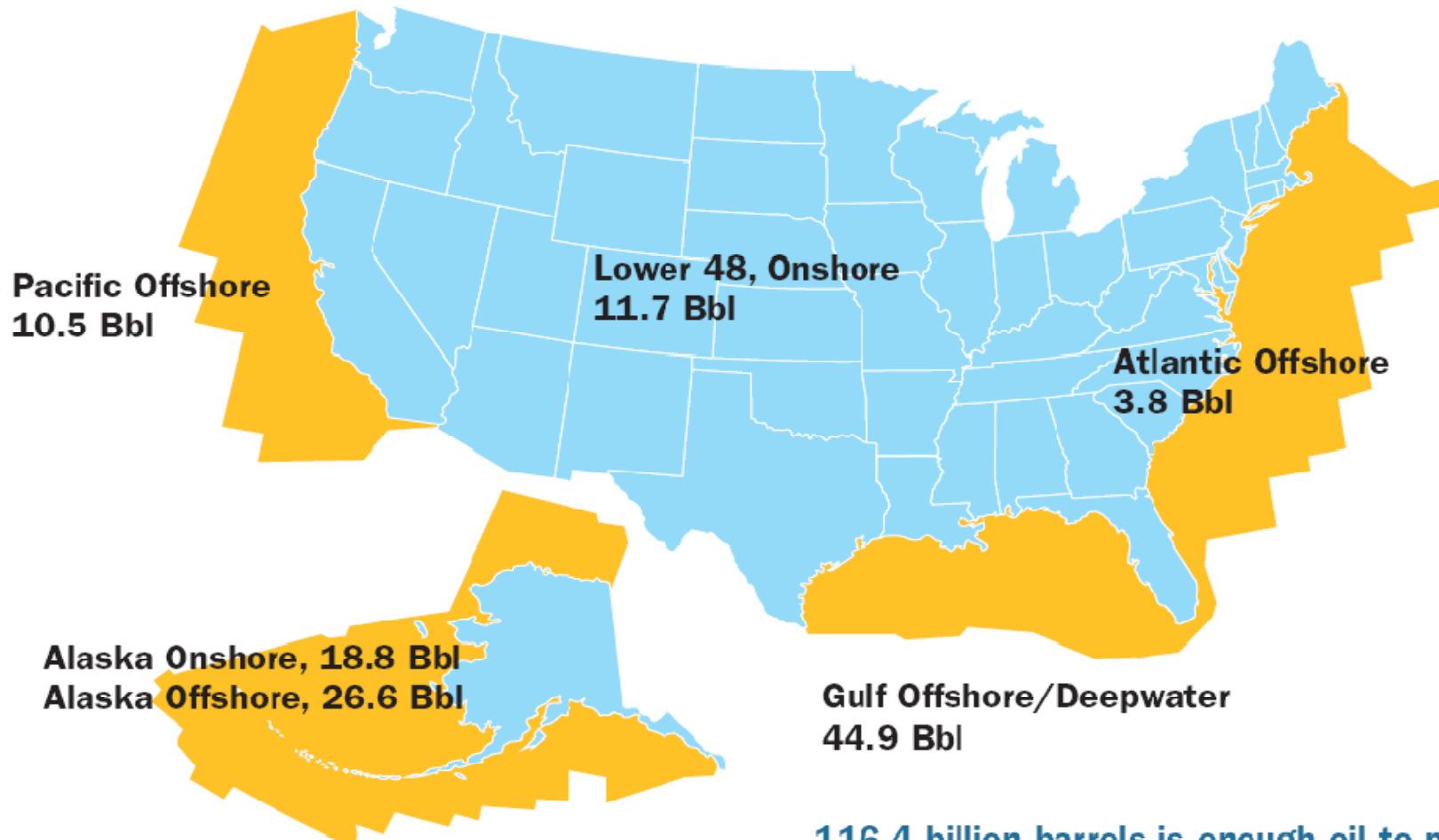


Excludes all moratoria areas

The Endless Resource



U.S. Crude Oil Resources (Undiscovered Technically Recoverable Federal Resources)*

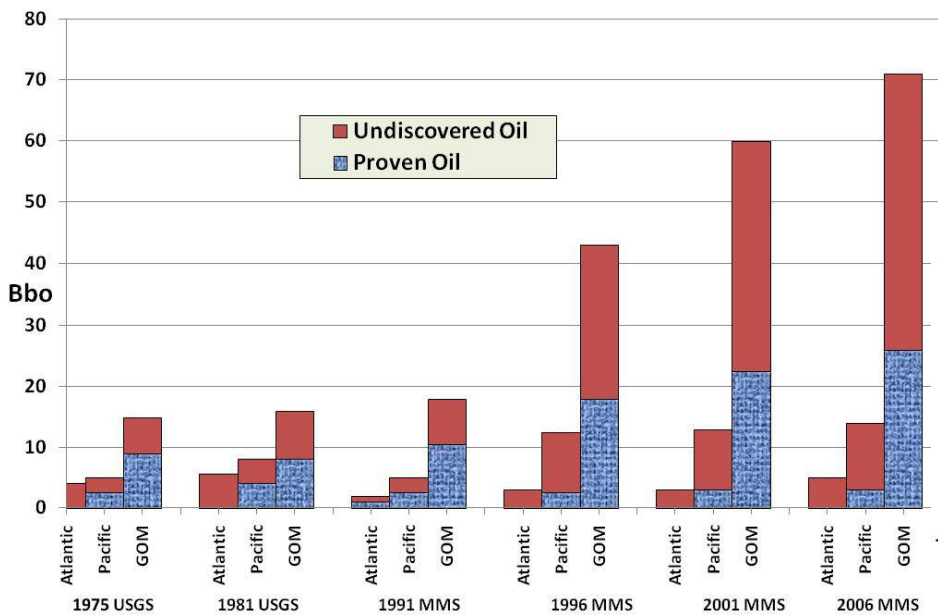


Source: MMS, BLM, and API calculations

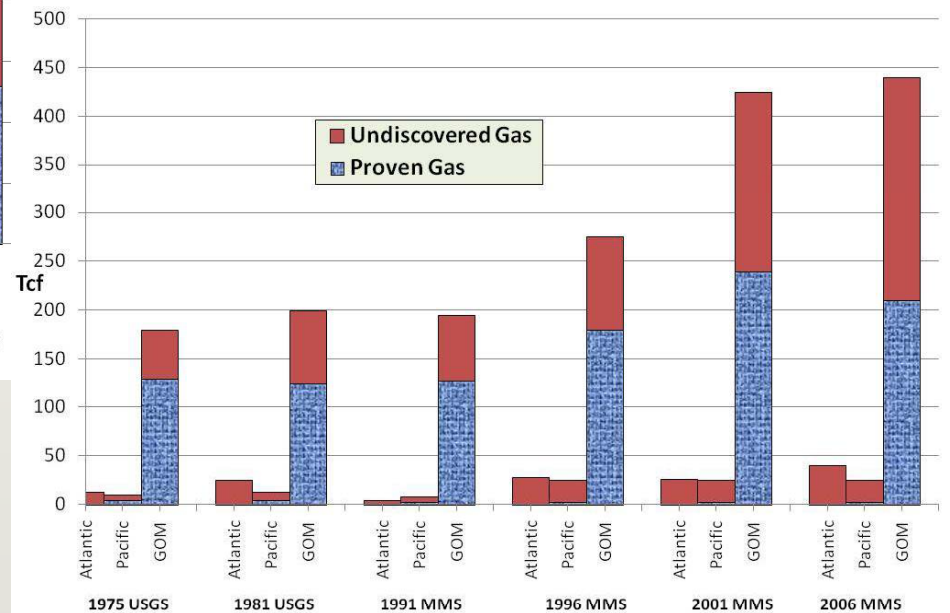
*Figures may not add exactly to total due to rounding.

116.4 billion barrels is enough oil to power over 65 million cars for 60 years.

NARUC Moratoria Study (SAIC/GTI)



MMS Proven and Undiscovered Oil Resources (GOM Year 2006 Proven Oil Numbers Include 13 Bbo of Oil Production)

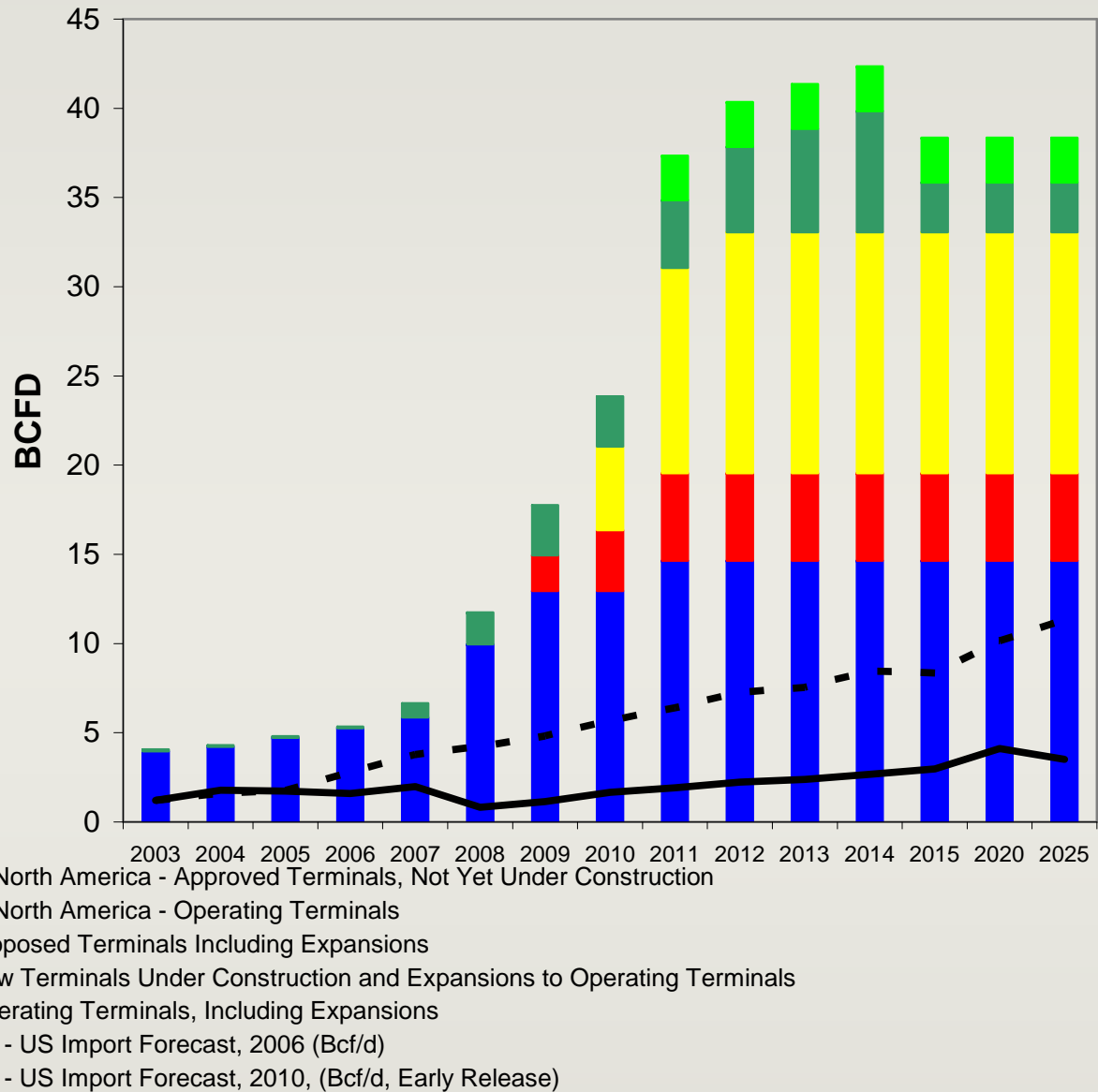


MMS Proven and Undiscovered Gas Resources (GOM Year 2006 Proven Gas Numbers Include 152 Tcf of Gas Production)

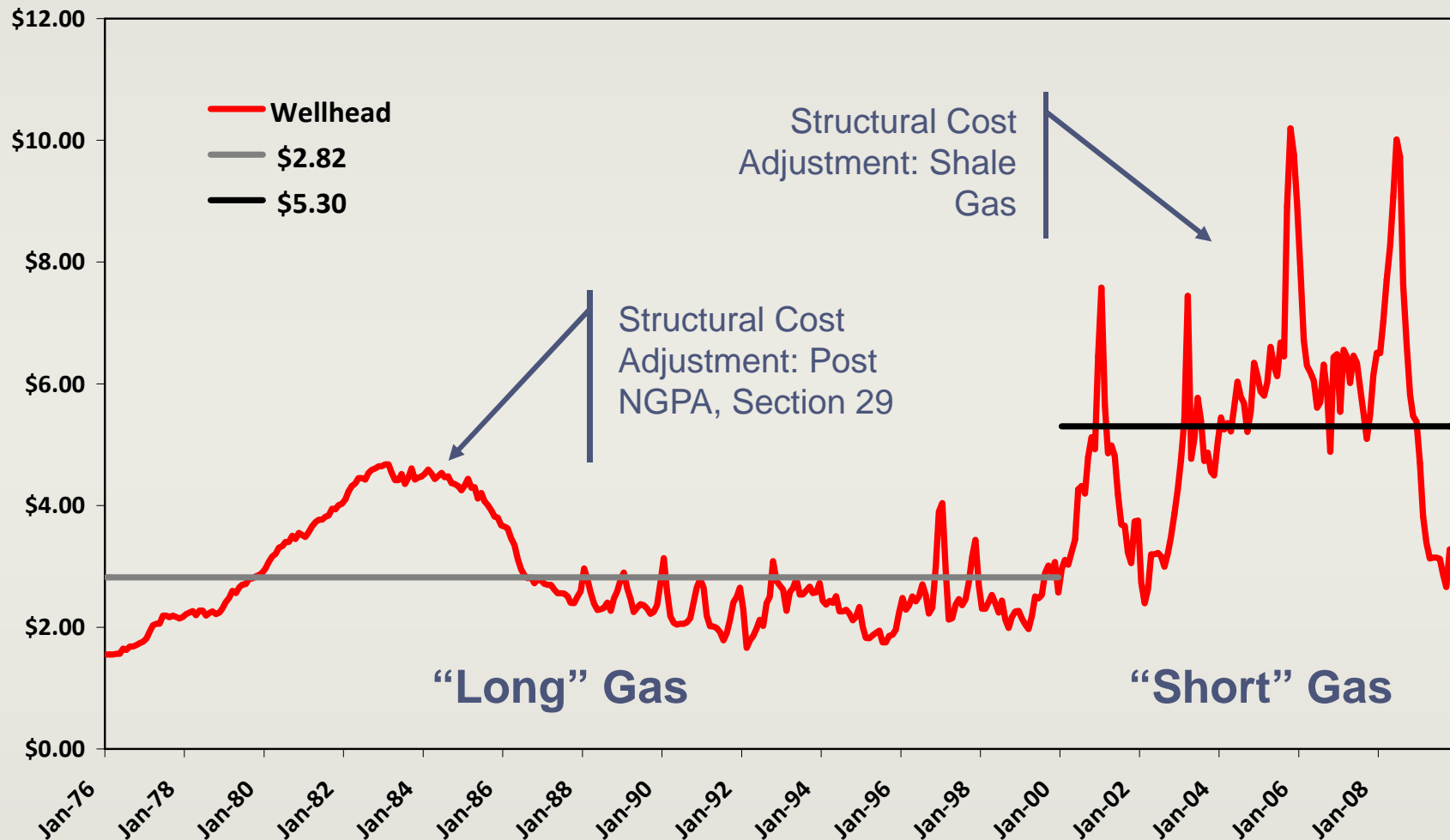
CEE-UT US/North America LNG Import Capacity Assessment

Based on agency pre-filings, filings, approvals and industry information.
As of: March 2010

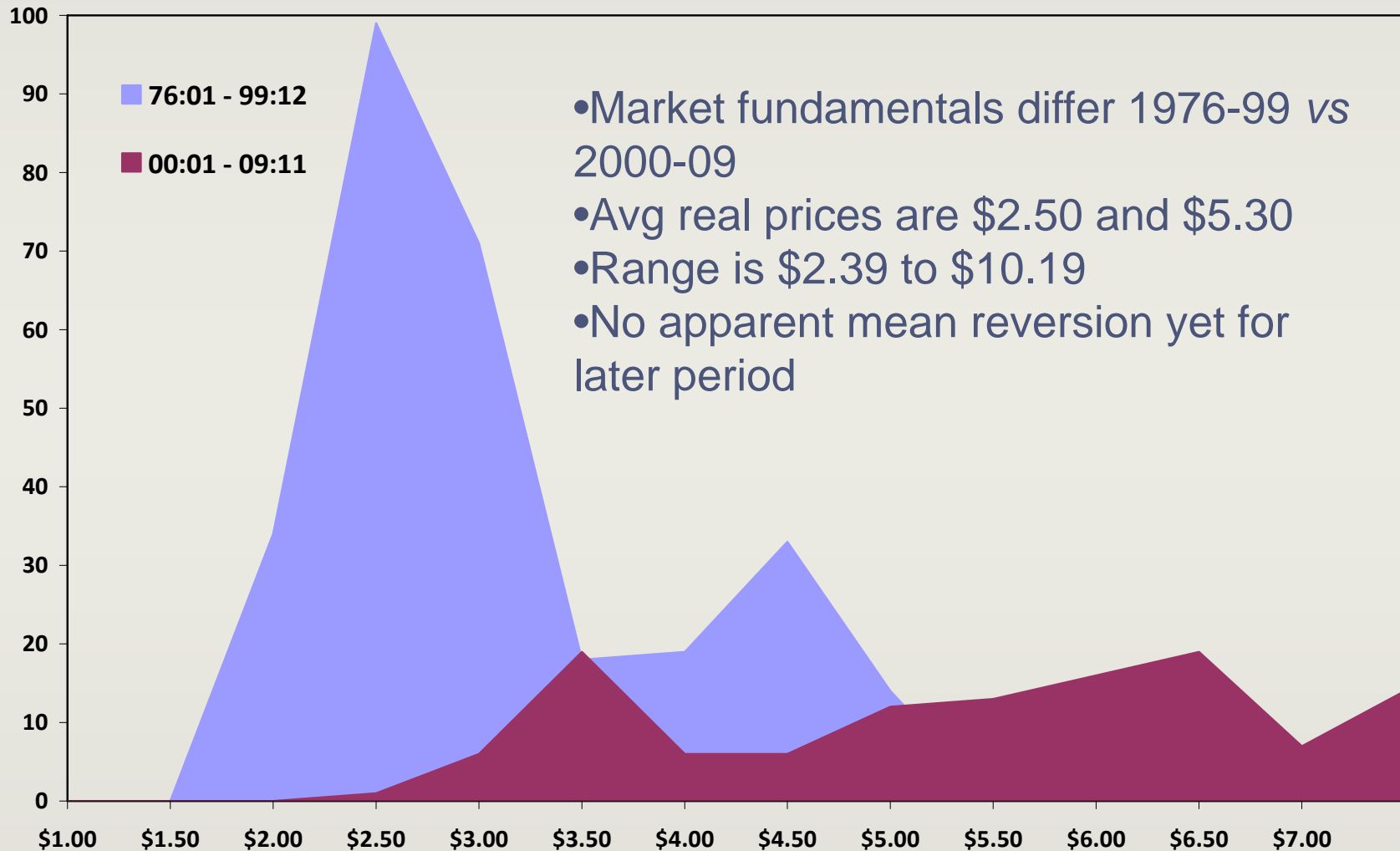
NOTE: Includes both onshore projects (in US, Federal Energy Regulatory Commission, FERC) and offshore (in US, Coast Guard and Maritime Administration, USCG/MARAD). US Gulf Coast capacity is an estimate of most likely additions based on projects under construction and approved projects and expansions (onshore and offshore).



Wellhead Price Eras (\$2005)



Frequency Distribution (\$2005)



*Price Volatility (\$2005)

	Wellhead	City Gate	Res	Com	Ind	El Pwr
Before 99:12	7.2% ^a	6.0% ^b	6.3% ^c	2.5% ^b		
00:01-09:11	12.2%	10.5%	7.7%	5.3%	11.4% ^d	10.6% ^e
Change	71%	74%	22%	110%		
^a 76:01-99:12; ^b 83:10-99:12; ^c 81:01-99:12; ^d 01:01-09:12; ^e 02:01-09:12						

* Std dev of change in price

Modern Energy Markets

Policy/Regulatory Frameworks

- Market structure (entry, exit)
- Transparency
- Public interest

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Physical Fundamentals

Supply-demand for
Commodities



Financial Markets

Supply-demand for commodity
derivatives



*What are the
interactions?*

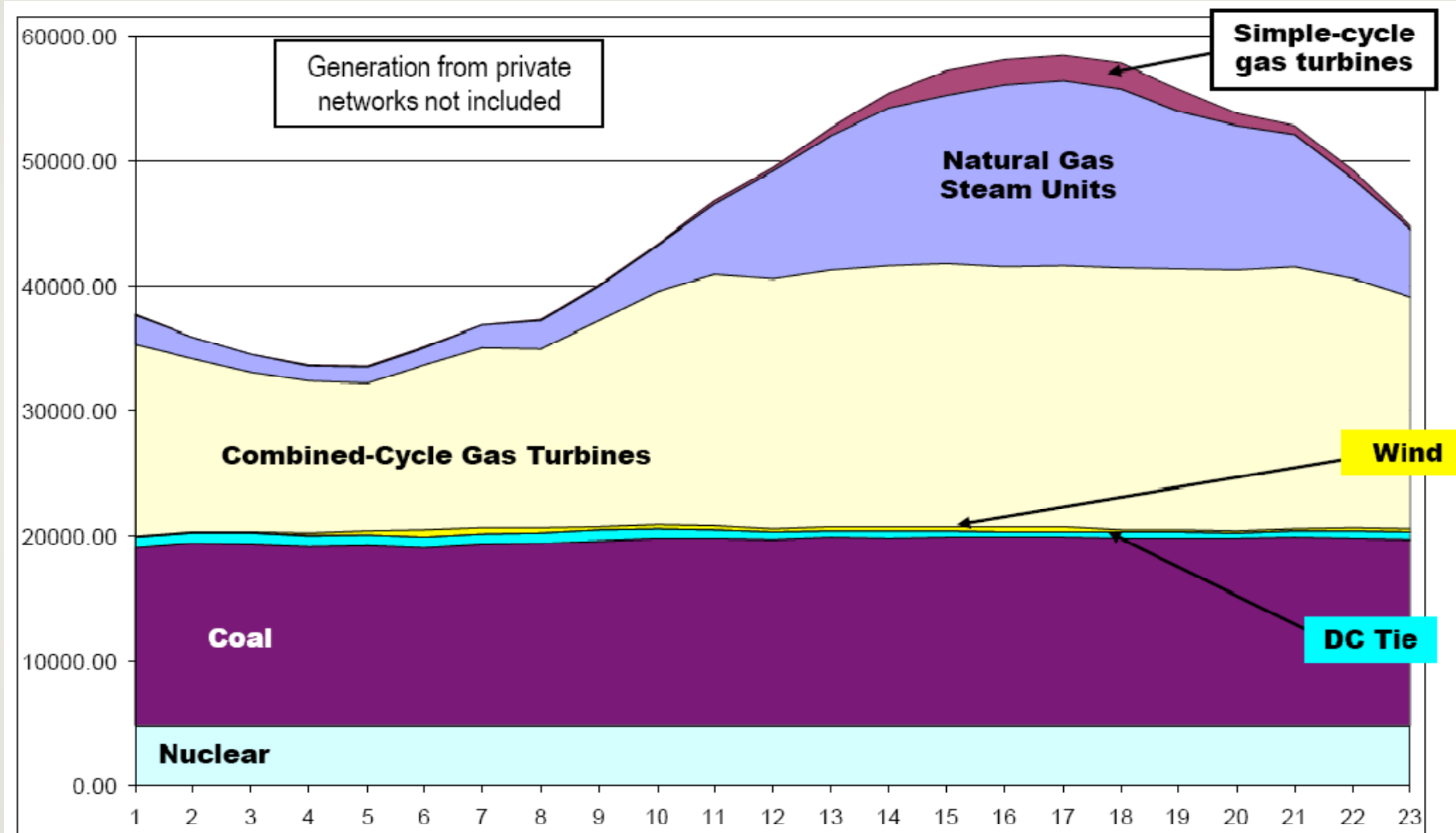
Behavioral Responses

- To real signals from physical, financial markets
- To perceptions of signals from physical, financial markets

Price Observations

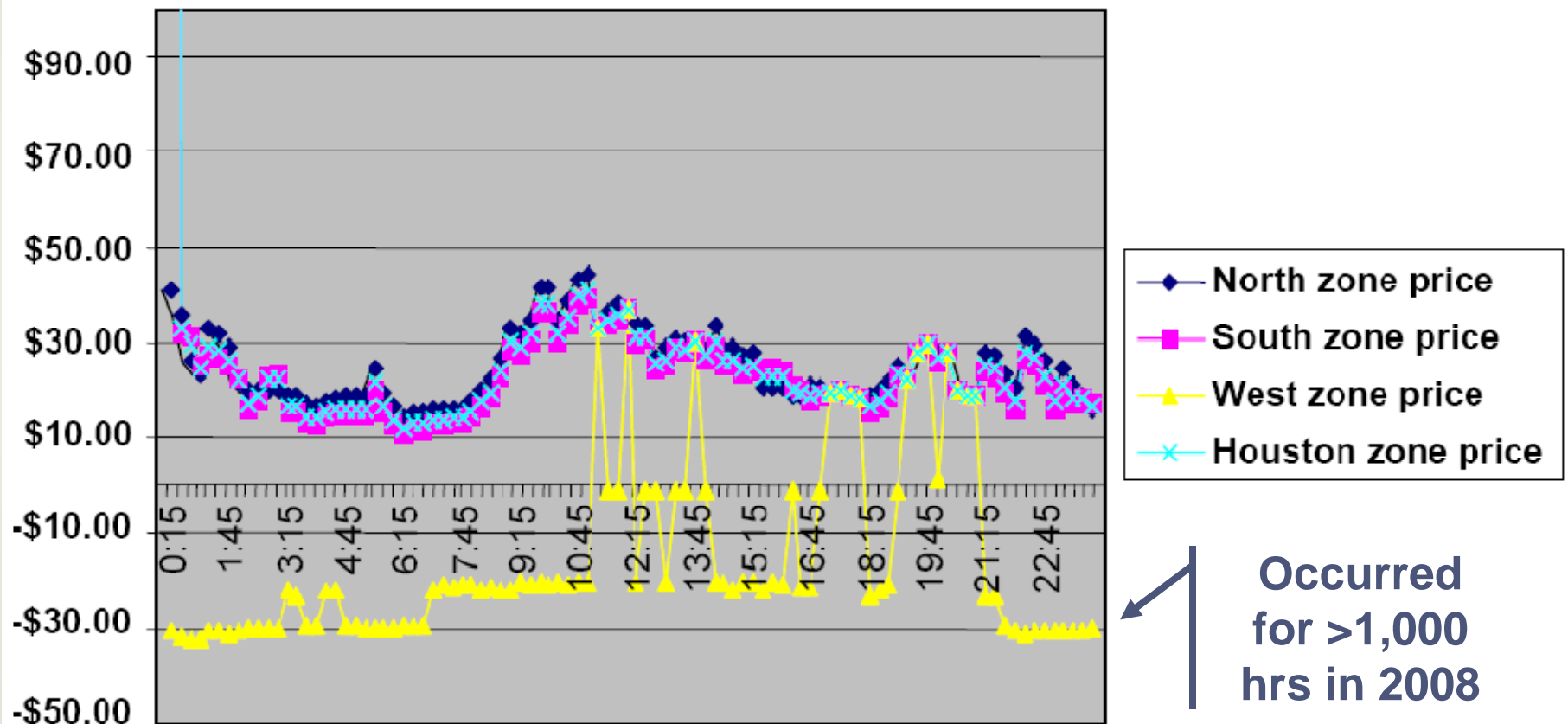
- Volatility is a sensitive issue for large users and regulated utilities; lack of data prevents analysis on changes over time
- Residential (and some commercial) customers are sheltered by regulators
- Wellhead conditions drive overall price structure and may contribute to volatility
- Electric power demand swings on marginal gas generators + renewables may contribute to volatility

ERCOT Peak Day by Fuel Type

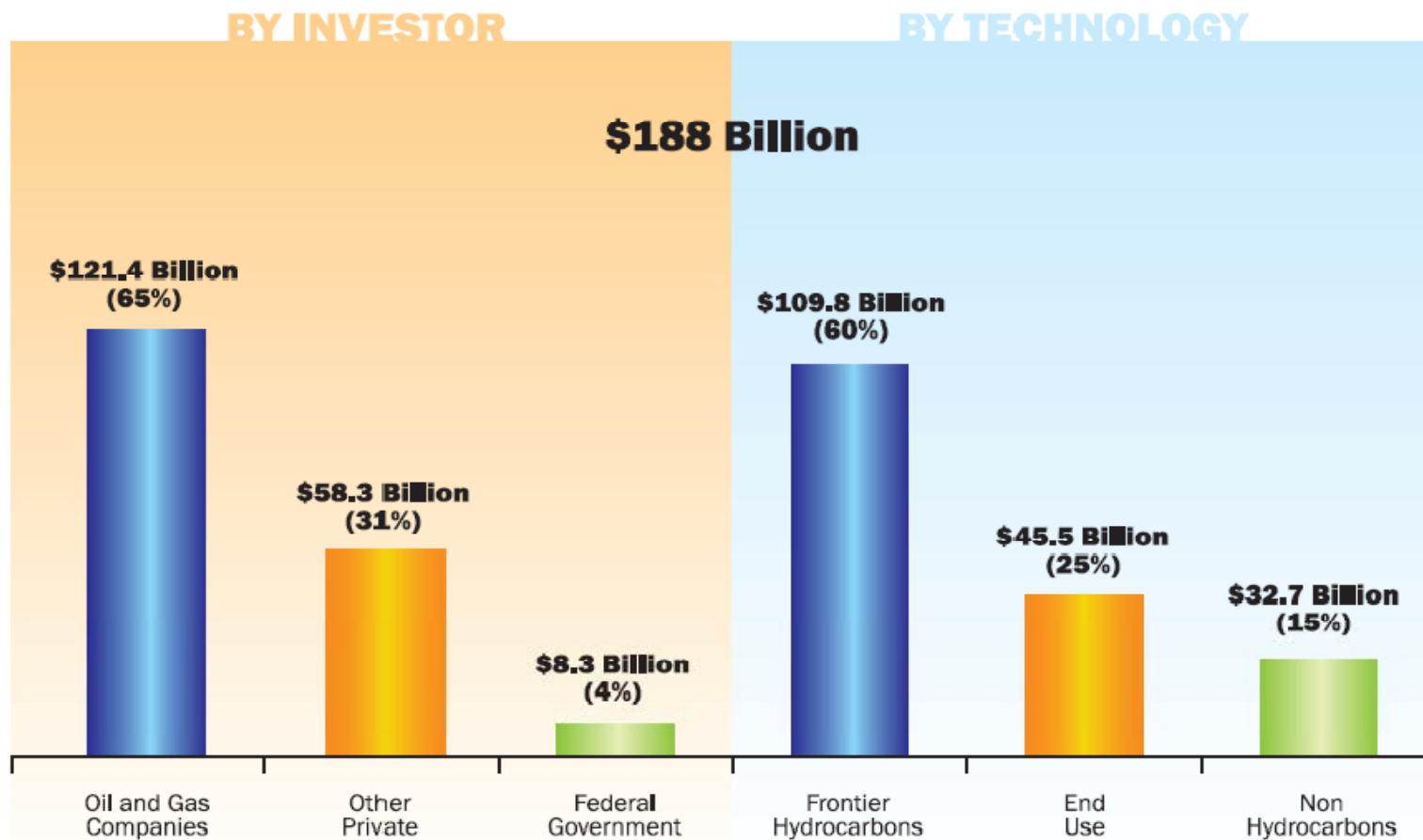


Does Renewable Energy Create Volatility?

ERCOT balancing market prices, March 7, 2009, US\$/MWh.

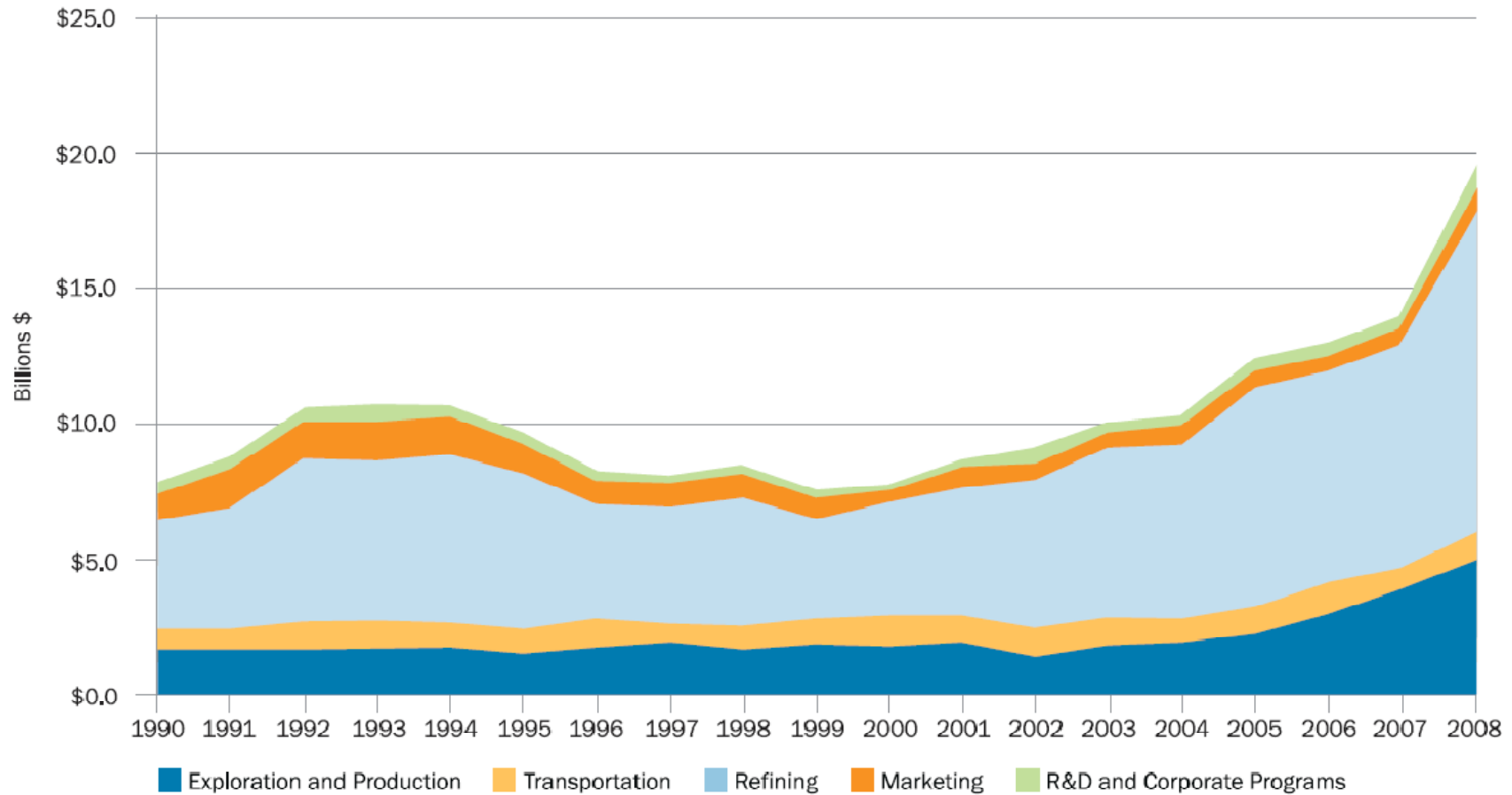


Technology – Our Industry’s Investments (2000-2007)



Source: T² and Associates and CEE

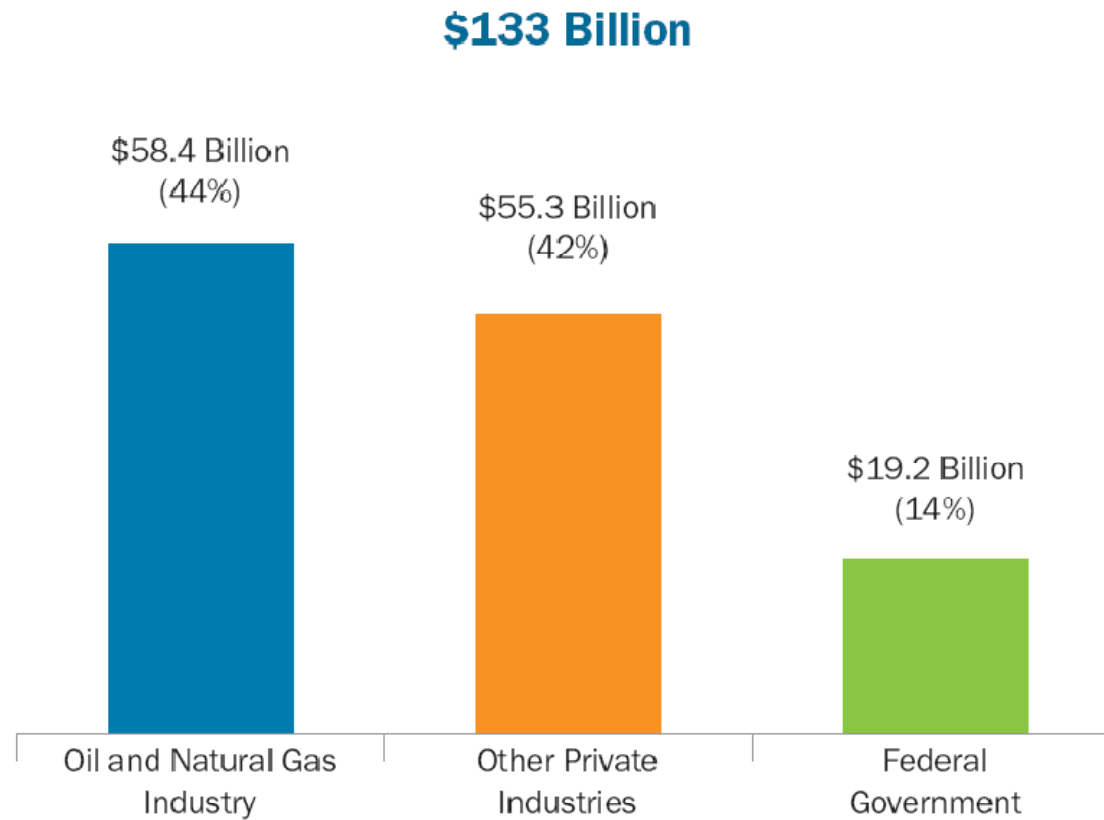
U.S. Environmental Expenditures since 1990 (by sector¹)



¹ Remediation & Spills expenditures are included in the sector numbers and are reported data only. The remaining sector expenditures are estimated for the entire industry.

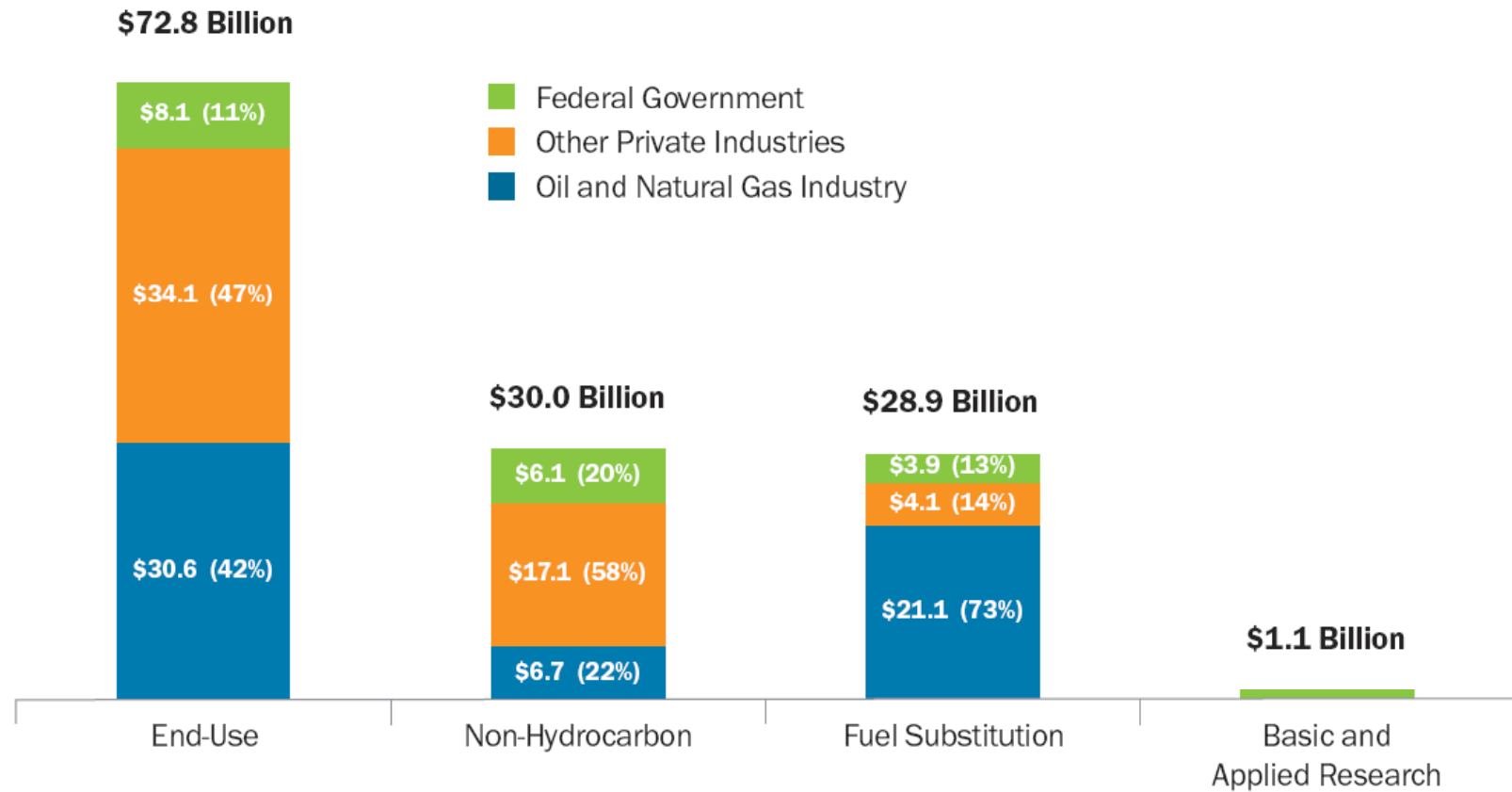
Source: API Statistics, Environmental Expenditures by Oil and Gas Industry, February 2010.

Carbon Mitigation Investment by Investor Group (2000-2008)



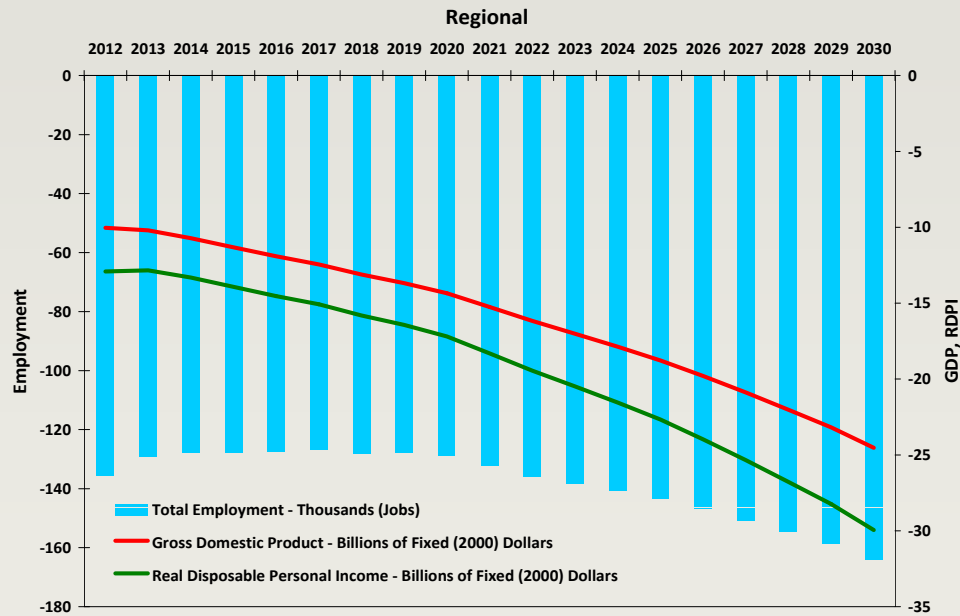
Source: T2 & Associates and CEE, June 2009.

Carbon Mitigation Investments by Technology and Investor Group (2000-2008)

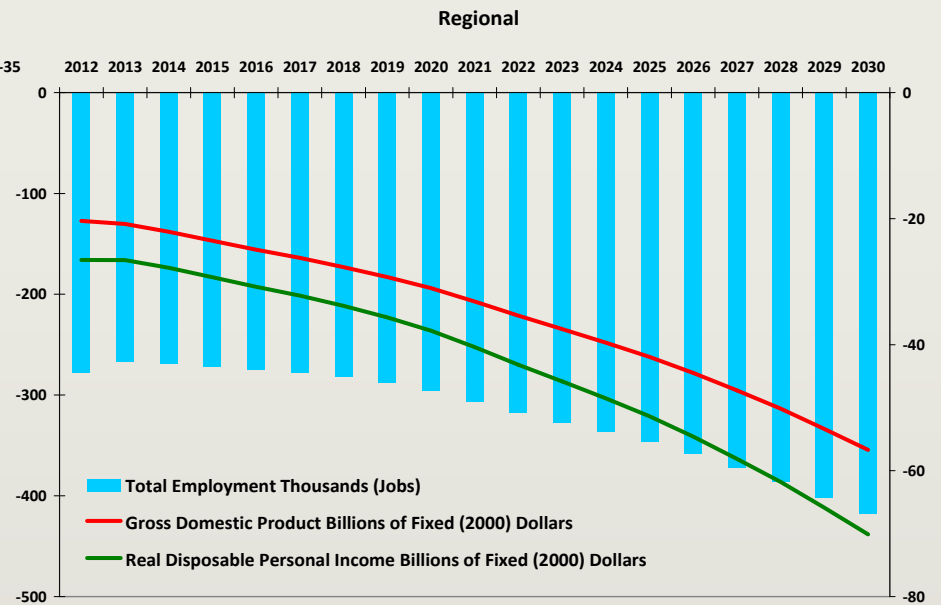


Source: T2 & Associates and CEE, June 2009.

ACESA & Texas



Reference Case



High Case

Energy per Capita (Btu, Left) and Industrial Energy Consumption Share (Right)

