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Meet With Us

The Energy Industry Update
American Gas Association Executive Conference Special Edition

Highlights of Recent Significant Events and Emerging Trends

October 2012

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Executive Summary

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Managing with Uncertainty Fatigue

As the economy grows (slowly) and we near the presidential election, many policies affecting the power and gas industries are in flux. From fracking regulation to power plant emissions to renewable incentives, litigation and political uncertainty about what prevailing policies might emerge in 2013 has put the timing and, in some cases, the scope of new rules in limbo. Despite this uncertainty, the energy industry is running out of time on some strategic actions and is moving to make investments (or retirements) in power supply, infrastructure expansion (or shoring up reliability "hotspots"), and new technologies.

Knock-on Effects of Cheap Natural Gas	❑ Low natural gas prices have affected the nation's power supply, challenging the economics of proven solar and wind renewable technologies and altering the traditionally favorable dispatch position of coal-fired power ❑ As the gas-fired power generation grows, the linkages between natural gas and power operations become increasingly important, and regulators and industry leaders are contemplating how to improve that coordination ❑ Cheap gas-fired generation also appears to be impacting retail choice markets. Retailers' commodity (energy) costs have declined with gas prices, helping them compete with utility provider-of-last-resort service ❑ Low natural gas prices have also led to increasing interest in the use of natural gas as a transportation fuel, although fueling infrastructure, while growing, requires further expansion
Environmental Requirements Becoming Real	❑ EPA has finalized new regulations on SO_2 and NOx emissions as well as mercury and air toxics, even as it proposes greenhouse gas regulations for new power sources that effectively ban new coal-fired power plants ❑ Deadlines for compliance with EPA's proposed regulations are fast approaching, delayed only by litigation. The electric industry is beginning to adjust its generation complement accordingly, as the shale gas boom makes gas-fired power compelling for new generation, at least for the moment
Safety Front and Center	❑ One year after the Fukushima Daiichi nuclear event, the U.S. nuclear industry has begun working its "way forward" to ensure the public that it is incorporating its key lessons ❑ With aging pipes and after some high-profile incidents, gas pipeline and distribution operators have strengthened their safety programs as regulators use a carrot-and-stick approach to spur safety-related improvements
Grid Policy Push and Pull	❑ Smart metering has hit bumps in some jurisdictions, as both customers and regulators have concerns about cost and issues with personal privacy and security ❑ Compliance filings with FERC's Order 1000, intended to spur power transmission investment, are due in 2012. Sticky issues around cost allocation, planning, and rate incentives remain largely unresolved

From the CEO to Shareholders: Some Quotes and Themes

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	Electric and Combination Utilities	Electric Distribution Utilities	IPPs and Merchants	Gas Local Distribution Companies (LDCs)	Gas Pipelines
Mergers, Acquisitions, Divestments, and Retirements	❑ "Purchasing and/or constructing natural gas-fired electric generation facilities"	❑ "Invested nearly $900 million in transmission and distribution infrastructure"	❑ "Successfully integrating the companies and achieving annual cost savings targets" ❑ "Analyzed the investment in environmental controls required for a number of our facilities…expect to deactivate facilities"	❑ "Working innovatively…to transport [customers'] supplies to market from transportation-constrained areas" ❑ "Backlog of…shale wells shut in and waiting for development of natural gas gathering and processing infrastructure"	❑ "Acquire and develop energy transportation assets" ❑ "Build or acquire logistics assets strategic to market fundamentals" ❑ "Share capital costs and risks through JVs or alliances" ❑ "Leverage economies of scale from incremental acquisitions and expansions" ❑ "Actively pursing projects to serve power generation load"
Operations and Financial Issues and Initiatives	❑ "Developing our human capital and talent pool"	❑ "Facing higher untracked pension expense"	❑ "Higher capacity factors...due to lower gas prices improving off-peak economics for combined cycle over coal units" ❑ "New cost and performance improvement initiative" ❑ "Hedge a substantial portion of our coal-fired baseload generation"	❑ "Lower the commodity price risk…through the use of swaps and basic hedges" ❑ "Target a 12% reduction in GHG emissions for every therm of gas delivered…by 2015"	❑ "Interstate and intrastate transportation rate challenges"

Sources: Company annual reports, web sites, and investment analyst presentations

From the CEO to Shareholders: Some Quotes and Themes (Cont'd)

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	Electric and Combination Utilities	Electric Distribution Utilities	IPPs and Merchants	Gas Local Distribution Companies (LDCs)	Gas Pipelines
Growth Initiatives and Capital Projects	❑ "Established our new transmission operations segment" ❑ "Advanced our commercial transmission business through formation of a joint venture" ❑ "Implementing emission controls and performance upgrades" ❑ "Integrating advanced grid technologies into existing electric networks" ❑ "Implemented some actions and upgrades at our nuclear facilities stemming from the Japan learnings"	❑ "Replace and upgrade our extensive electric, gas, and steam networks" ❑ "Implementing first large-scale smart grid project… sensors and transmitters" ❑ "Deployment of 1.3 million smart meters…by the end of 2013"	❑ "Development of the…first power plant in the U.S. with a federal limit on GHG emissions" ❑ "Higher market prices to provide adequate returns on some investment in environmental controls necessary to meet… anticipated requirements"	❑ "The catalysts for the future are shale gas, utility infrastructure development, and the market's demand for low-cost, efficient, and available energy sources" ❑ "Invest...in projects to accommodate the growing NGL supplies" ❑ "Execute expansion projects to serve new gas-fired power generation growth" ❑ "Remained committed to infrastructure improvement and pipeline replacement"	❑ "Optimizing liquids opportunities in western U.S. business" ❑ "Further expand our renewable fuel-handing capabilities" ❑ "Enhance the stability of our cash flows by investing in pipelines and other fee-based businesses" ❑ "Design and improve our gas gathering infrastructure"
Customer-Side Initiatives	❑ "Develop and implement efficiency and demand response programs"	❑ "Launched a special emergency restoration improvement program" ❑ "Businesses receive incentives to reduce energy use when demand is highest"			

Sources: Company annual reports, web sites, and investment analyst presentations

Utility and Energy Stock Prices: Are Electrics and Diversifieds Undervalued?

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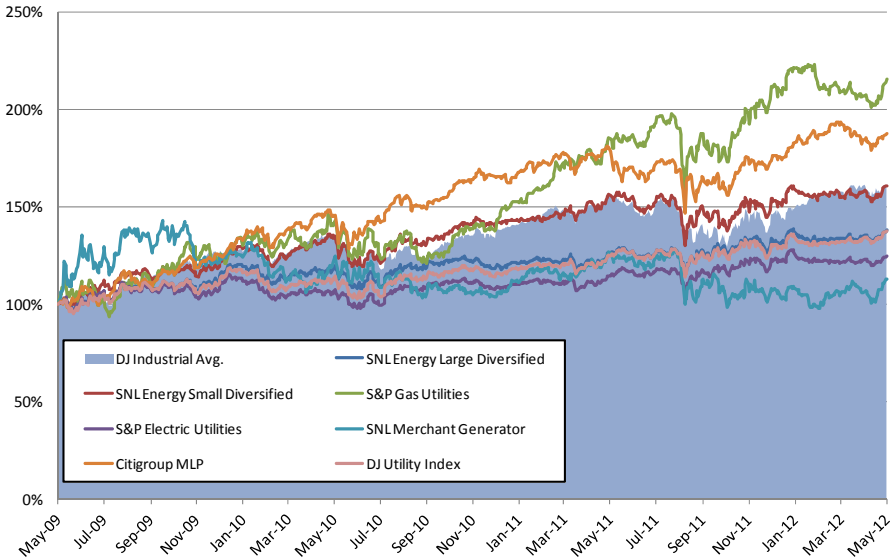
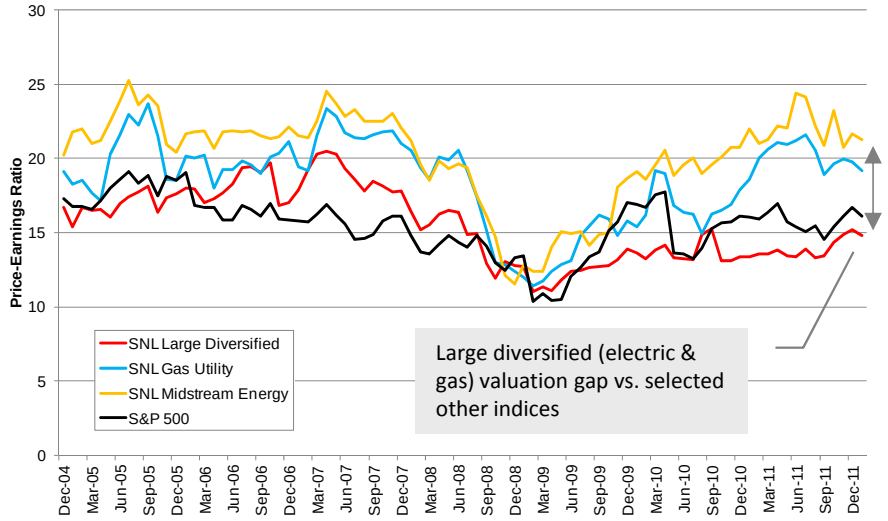
Gas LDCs and MLPs have Outperformed the Dow Since Mid-2009, While Other Utility Indices Have Lagged

Selected Stock Index Values (May 2009–Jan. 2012) (May 1, 2009 = 100%)



Valuation Gap: Price-Earnings Ratios for Large Diversifieds Compared with Other Energy Sectors

Selected Month-End Index Price-Earnings Ratios (Trailing 12 Months Earnings) (Dec. 2004–Jan. 2012)



Index Performance as of May 1, 2012

	Since May 2007	Since May 2009	Since Dec. 2010
SNL Energy Large Diversified	88%	138%	116%
SNL Energy Small Diversified	107%	161%	114%
S&P Gas Utilities	144%	215%	155%
S&P Electric Utilities	81%	125%	115%
SNL Merchant Generator	38%	113%	109%
Citigroup MLP	115%	188%	114%
DJ Industrial Average	101%	162%	118%
DJ Utility Index	90%	138%	119%

Index = 100%

"Positive on fundamentals…[D]espite the mild winter, most utilities should see above-average long-term EPS growth, generally driven by capex rather than economic growth."—*Macquarie*

"The [natural gas MLP] group is trading at a spread to the 10-year Treasury of 372 basis points compared to its long-term average of 300 basis points."—*Deutsche Bank*

"Exceptionally mild weather conditions to drag on electric and gas distribution businesses…We expect hybrid* utilities and IPPs to generally experience a negative impact from lower year-over-year commodity prices, though large hedge positions will likely offset much of the potential downside."—*J.P. Morgan*

Note: *Part regulated, part unregulated.

Sources: SNL Financial; www.multipl.com (S&P 500 monthly multiples); ScottMadden analysis

Electric Utilities: A Consolidating Industry—Some Highlights from the Last 15 Years

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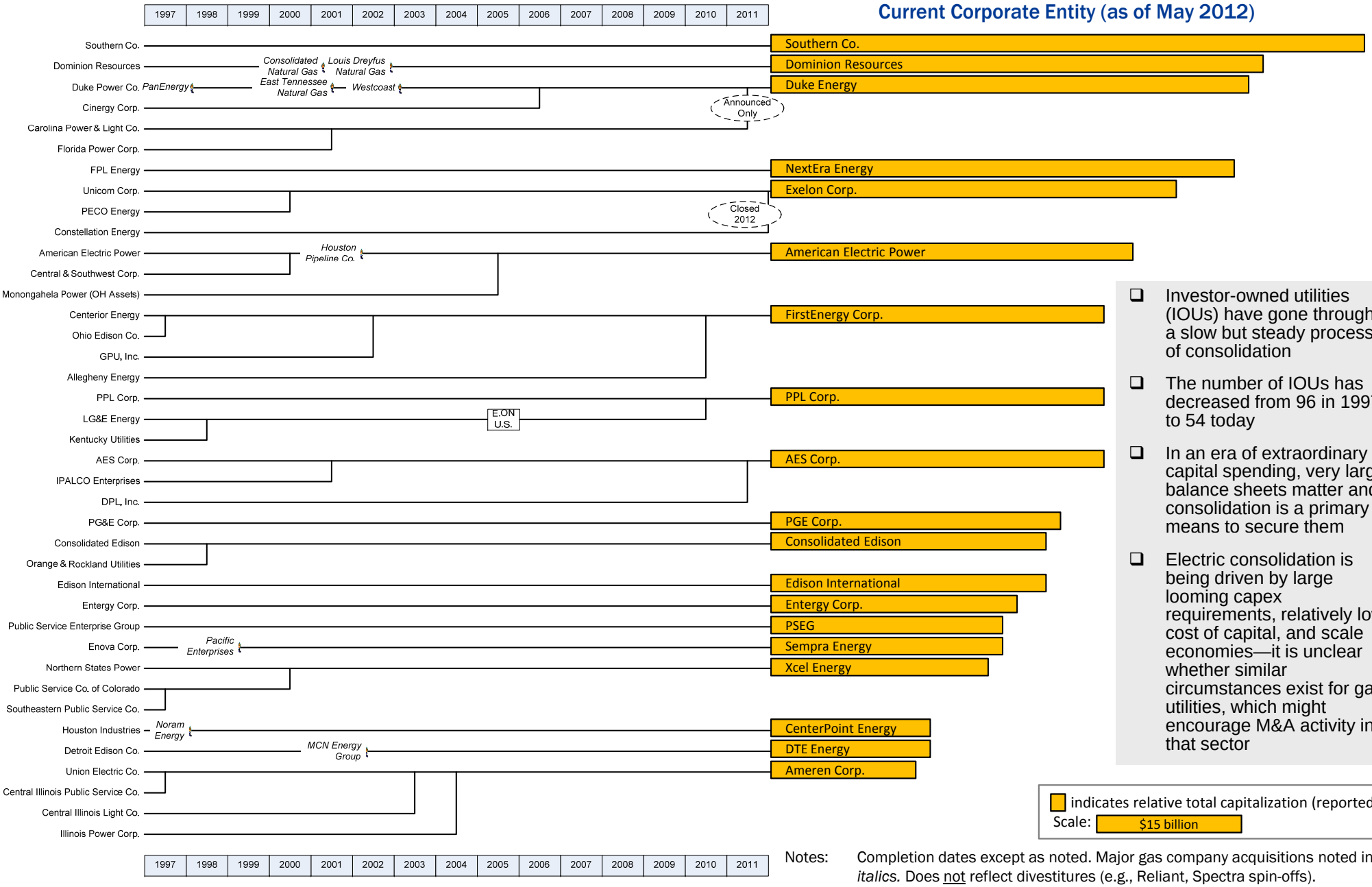

- Investor-owned utilities (IOUs) have gone through a slow but steady process of consolidation
- The number of IOUs has decreased from 96 in 1997 to 54 today
- In an era of extraordinary capital spending, very large balance sheets matter and consolidation is a primary means to secure them
- Electric consolidation is being driven by large looming capex requirements, relatively low cost of capital, and scale economies—it is unclear whether similar circumstances exist for gas utilities, which might encourage M&A activity in that sector

Notes: Completion dates except as noted. Major gas company acquisitions noted in *italics*. Does not reflect divestitures (e.g., Reliant, Spectra spin-offs).

Sources: SNL Financial; Platt's Directory of Electric Power Producers and Distributors; FERC; ScottMadden research

Natural Gas Demand

Power Sector Gas Consumption Is Off the Charts in 2012…

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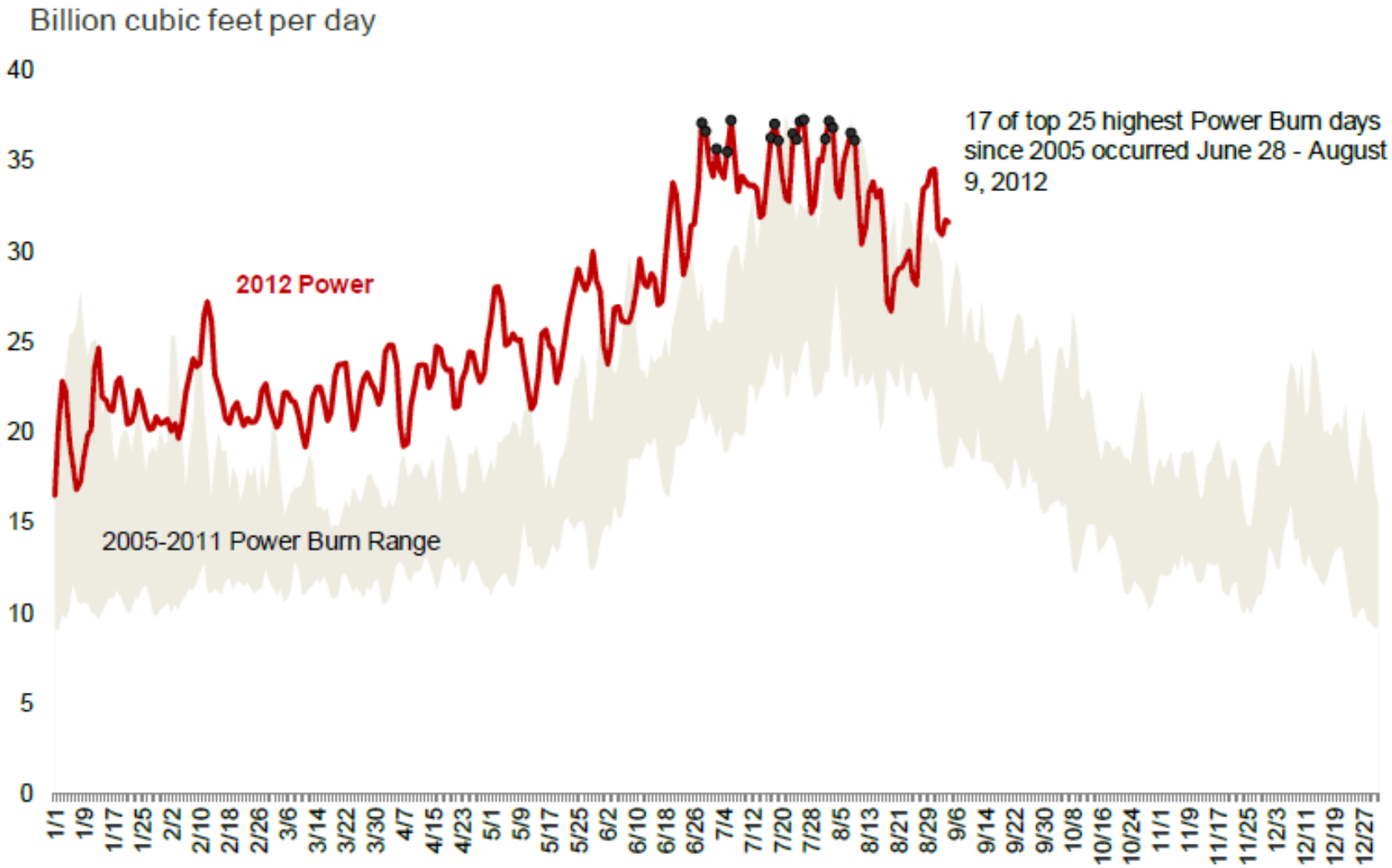
Daily U.S. Natural Gas Burn for Power Generation (2005–2011 and YTD 2012)



Source: EIA, "Natural Gas Markets: Recent Changes and Key Drivers," at LDC Gas Forum (Sept. 2012)

...Going Back as Far as 2001

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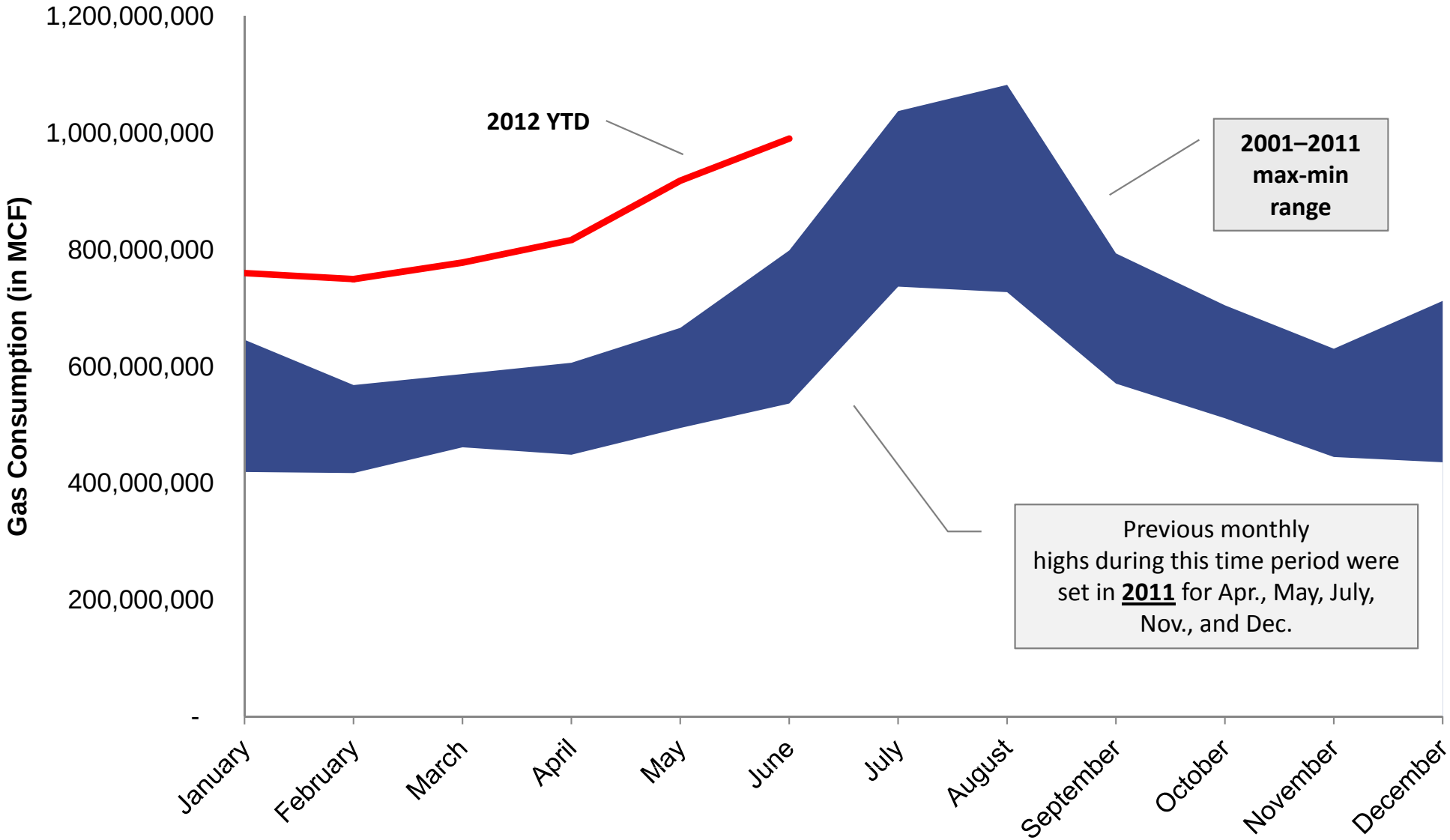
Monthly U.S. Natural Gas Burn for Power Generation (High-Low Range for 2001–2011 vs. YTD 2012)



Sources: EIA Form 923 data; ScottMadden analysis

Sufficient Widening of the Oil-to-Gas Price Ratio Could Fundamentally Alter Gas Demand

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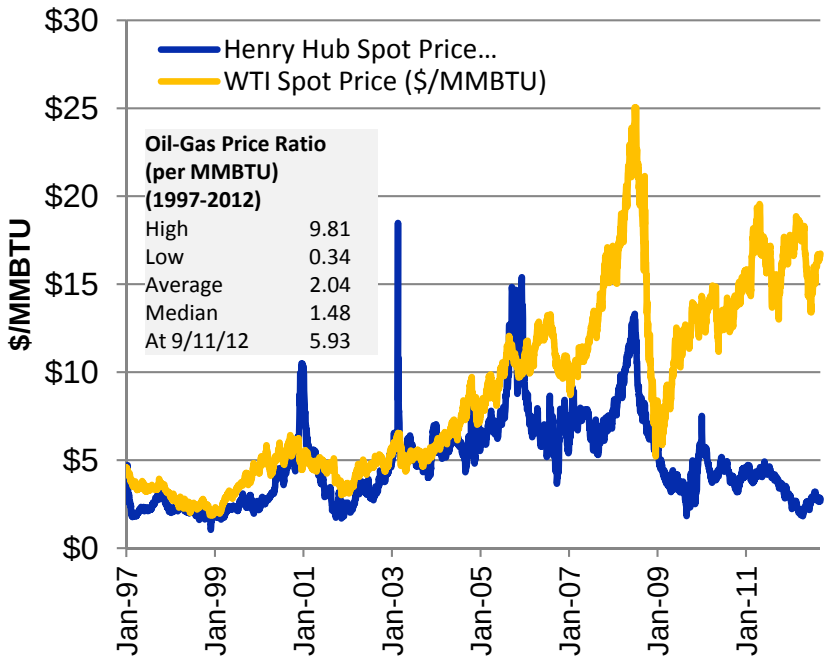
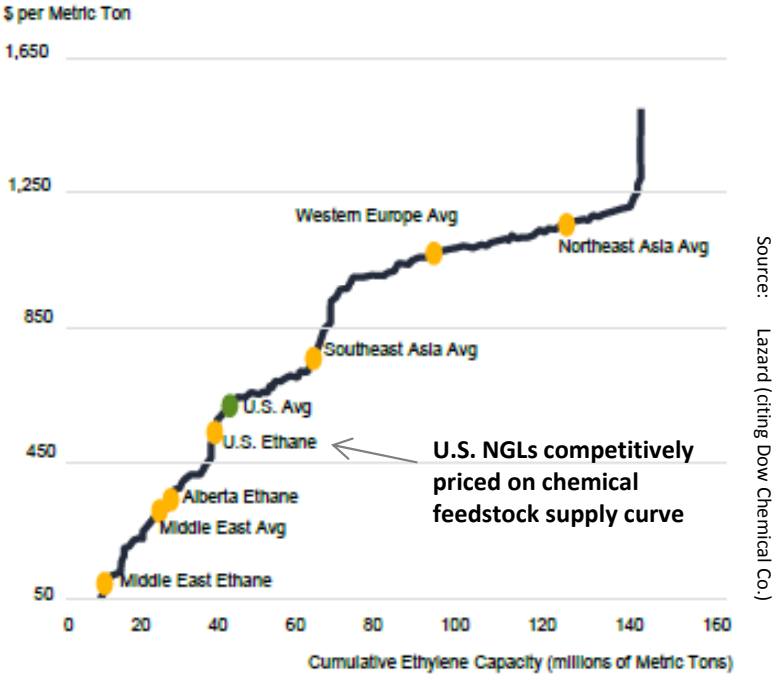
West Texas Intermediate Crude vs. Henry Hub Natural Gas Spot Price (Jan. 1997–Sept. 2012)



Global Ethylene Cash Cost Curve ($/Metric Ton) as of Oct. 2011



- Low natural gas prices coupled with sustained $90 to $100/barrel oil prices have created an oil-gas BTU-equivalent ratio of nearly 6X
- For chemical uses to be attractive, a rule of thumb is 7-to-1 ratio of $/barrel of oil vs. $/MMBTU of gas; at $100 oil and $3 gas, this ratio is significantly higher
- If these ratios are sustained, substitution effects could lead to increased demand for natural gas for CNG vehicles, methanol (for transportation or as synthetic diesel), ethane for chemical feedstock (in lieu of naptha), as well as new natural gas technologies
- For chemical applications, industry will have to invest in ethane cracking facilities—not built in the United States since 2001—close to end-users
- However, producers of "wet" plays must maintain liquidity in the face of low prices until these additional demand streams grow

Sources: EIA data; ScottMadden analysis; industry news; American Chemistry Council; Lazard; Dow Chemical

The Alignment of Gas and Power Infrastructure and Processes Will Be Increasingly Important

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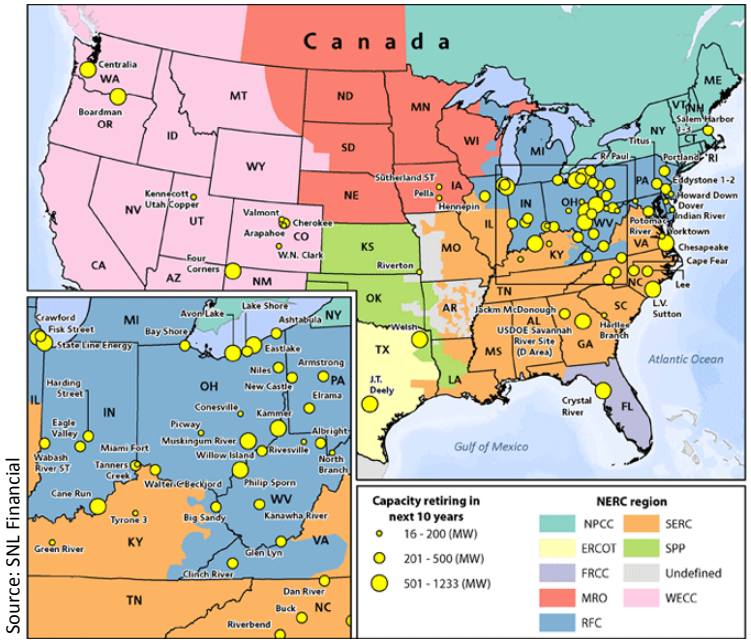
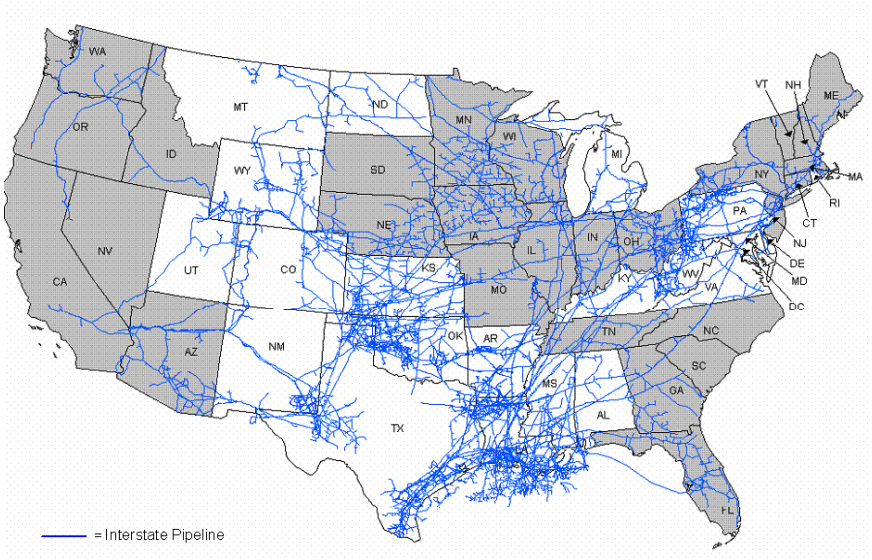
Announced Coal Plant Retirements (2012–2021) (as of Mar. 2012)



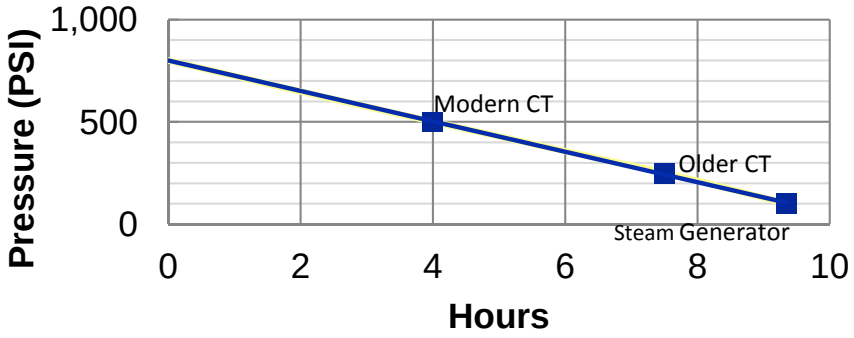
Source: SNL Financial

Interstate Natural Gas Pipelines (as of Year-End 2009)



- Gas-power interdependence is back on the front burner
  - EPA regulations, cheap shale gas, and increasing renewables penetration lead swings to gas generation
  - FERC had looked at this in the mid-2000s, as post-merchant, pre-Katrina bubble led to a significant increase in the ratio of gas to total generation
- Recent weather events (Texas, Southwest) have refocused attention on increased year-round power-sector gas demand
- Emerging pipeline adequacy and operation concerns
  - Capacity constraints
  - Scheduling differences
  - Pipeline pressure and line pack
  - Flow patterns
  - Curtailment

Time for 500 MW Unit to Exhaust Line Pack (36" Line @ 800 PSI)



Sources: EIA; SNL Financial; NERC

Natural Gas Vehicles: Increasing Interest, Especially with Cheap Natural Gas

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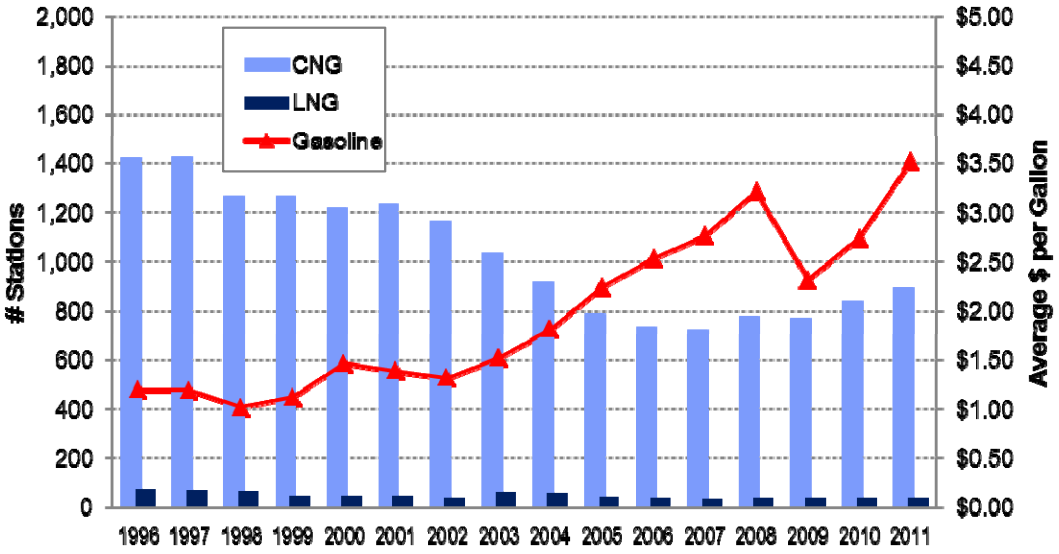
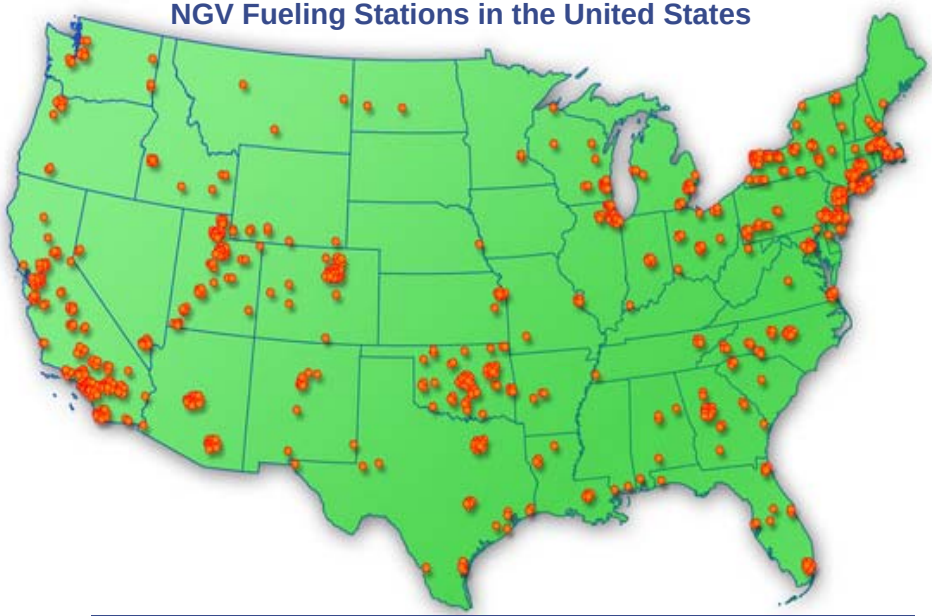
Total U.S. NGV Fueling Stations vs. Retail Gasoline Price



NGV Fueling Stations in the United States



Growth Drivers, Expectations, and Barriers

- Increased level of domestic gas reserves, concerns over dependency of oil, and initiatives and policies designed to decrease greenhouse gas emissions have increased interest in alternative fuel vehicles
- Limited refueling availability, higher costs, shorter driving ranges, lack of infrastructure, and heavier fuel tanks have prevented the wide acceptance of NGVs over petroleum-fueled vehicles
- If the price differential between natural gas and gasoline is sustained, the number of NGV fueling stations is likely to continue to increase. Use of natural gas as a transportation fuel has been growing at a rate of 10%–12% since 2006 and is expected to grow 25% by 2016
- The federal government has renewed its focus on natural gas-fueled transportation with incentives for fleet conversions and NGV purchases and funding for research toward new NGV technologies

Incentives and Policies Promoting NGVs

NAT GAS Act of 2011	Tax credit toward incremental purchase costs, fuel, and infrastructure
Alternative Fuel Tax Exemption	Alternative fuels used in a manner that the IRS deems nontaxable are exempt from federal fuel taxes
Improved Energy Technology Loans	DOE loan to eligible projects that reduce air pollution and promote early commercial use of advanced technologies
Regional Corridors	Planned networks of refueling stations located along key truck routes (i.e., major highways)
Other State Incentives	Other state funding, tax credits, and exemptions available in NY, GA, VA, OK, and CA

Sources: Industry news; ScottMadden research

Bulls and Bears Views on United States as the "Saudi Arabia of Natural Gas"

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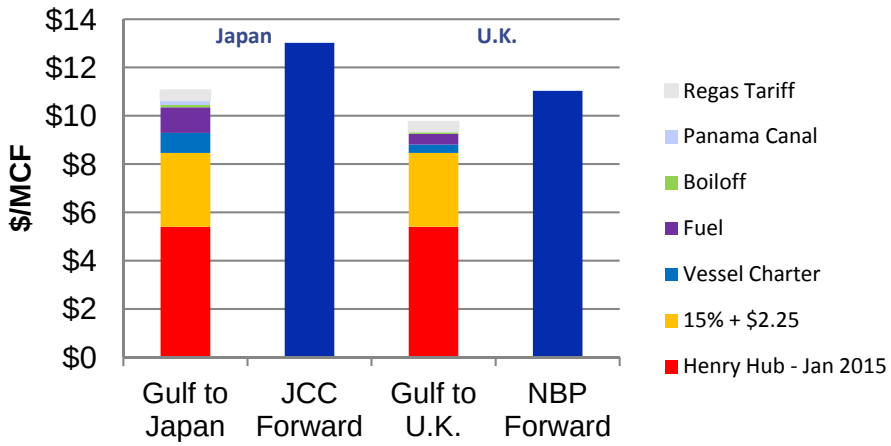
The Bullish View

- European gas production is dropping—the U.K., for example, has become a net importer of LNG
- Spain's gas is 80% LNG
- Japan's possible dismantling of its nuclear sector will put pressure on gas supply, already seen in its landed LNG prices; perhaps a similar situation emerging in Germany
- Europe is highly dependent upon Russia, which has used resources as geopolitical levers, for gas supply
- Several U.S. LNG facilities are considering reversing trains for export, with Sabine Pass (LA) fully approved
- Potential U.S. LNG will make global LNG supply curve more elastic, limiting long-term increases in price

The Bearish View

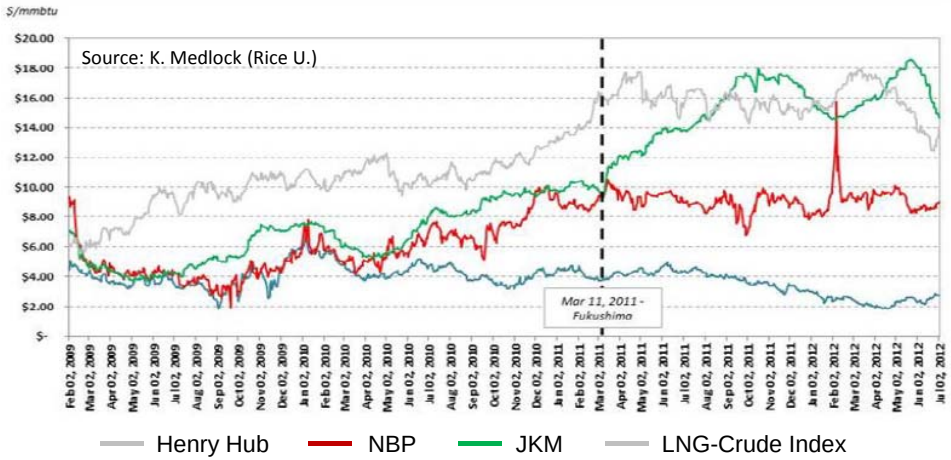
- Soft economic could contain gas demand growth, and Asian demand is uncertain
- Somewhere from 60%+ of European gas needs locked in with long-term contracts of unknown duration
- Hard to develop LNG export capacity quickly, and it will require long-term contracts with anchor tenants to justify investment
- Plenty of competition: Canada, Qatar, Australia, and others now; possible rich shale resources in China, Russia, and Africa; Russia, as swing producer, could be a spoiler
- Potential for political impediments at home to gas exports
- Price relationships and influenced by currency exchange rate, which could change with different policy

All-In U.S. LNG Cost at Gulf (Illustrative) vs. Japan and U.K. LNG Hub Prices



Source: B. Schlesinger & Assocs. (citing Deutsche Bank)

Selected International LNG Price Trends (Various Locations)



Notes: NBP is National Balancing Point (U.K.); JCC is Japan Customs-Cleared Crude; JKM is Japan/Korea Marker. All are market hubs used for LNG pricing.

Sources: EIA International Natural Gas Workshop (Aug. 13, 2012), presentations by Brattle Group; Benjamin Schlesinger and Associates, Kenneth Medlock (Rice Univ.), Howard Rogers (Oxford Institute for Energy Studies)

Natural Gas Prices: Low Near Term, but Extended Outlook Is Less Predictable

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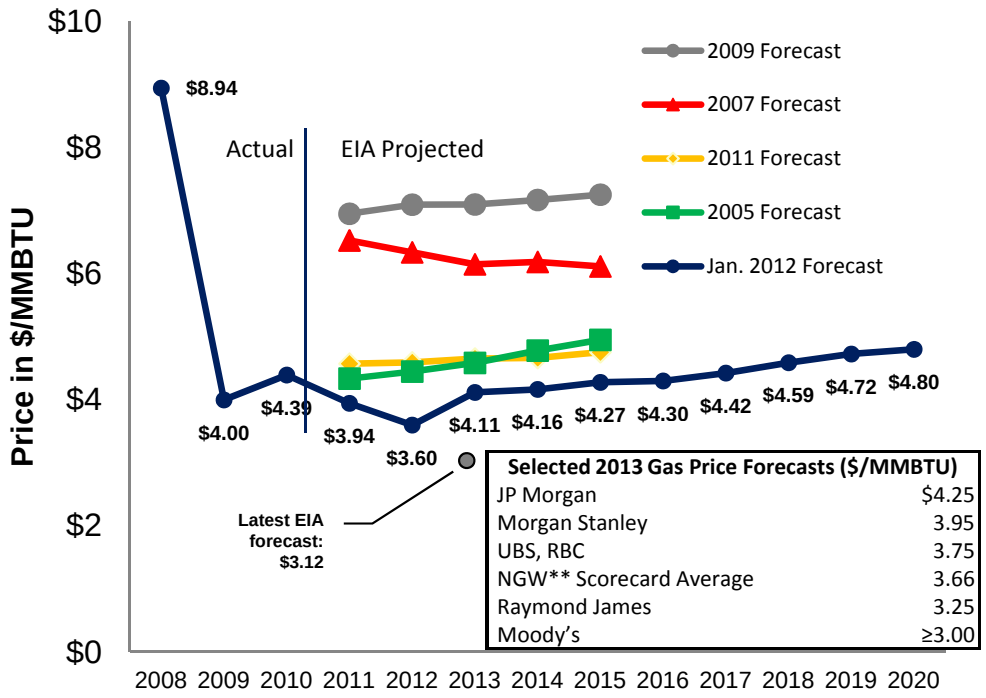
Gas Prices Remain Depressed

- Natural gas prices are not projected to return to pre-recession levels in the near to intermediate term
- U.S. government forecasts (shown right) reflect steady 2%+ per year growth
- Some contrarians, however, posit $6/MMBTU natural gas by 2015

Demand May Pull up Prices, but Supply Response and Impact of Worldwide Demand Create Uncertainty

- Industrial gas demand: Slow increase in the medium term, tempered by the sluggish U.S. economy
- Short-term gas demand from power generation is projected to increase, but that demand growth levels off longer term (~10 years)
- More Canadian gas may go to Asia as LNG export facilities in western Canada emerge to take Canadian gas traditionally exported to the United States—now displaced by shale gas
- Some big question marks: the impact of production efficiencies, drilling inventory, and gas demand response

EIA Actual and Projected Henry Hub Average Spot Price and Selected Forecasts ($/MMBTU*) (in 2010$)



Selected 2013 Gas Price Forecasts ($/MMBTU)	
JP Morgan	$4.25
Morgan Stanley	3.95
UBS, RBC	3.75
NGW** Scorecard Average	3.66
Raymond James	3.25
Moody's	≥3.00

Despite the apparent smooth trajectory, gas price volatility may remain, driven by pipeline constraints, increased gas consumption for power generation, and changing basis relationships.

Notes: *2005 forecast is in $/MCF and is an average wellhead price, not a Henry Hub average price.
**_Natural Gas Week_ (Aug. 6, 2011).

Sources: Industry news; EIA; IEA; FERC; SNL Financial; _Natural Gas Week_

Is a Supply Response to Low Gas Prices Taking Hold… and How Long Might It Last?

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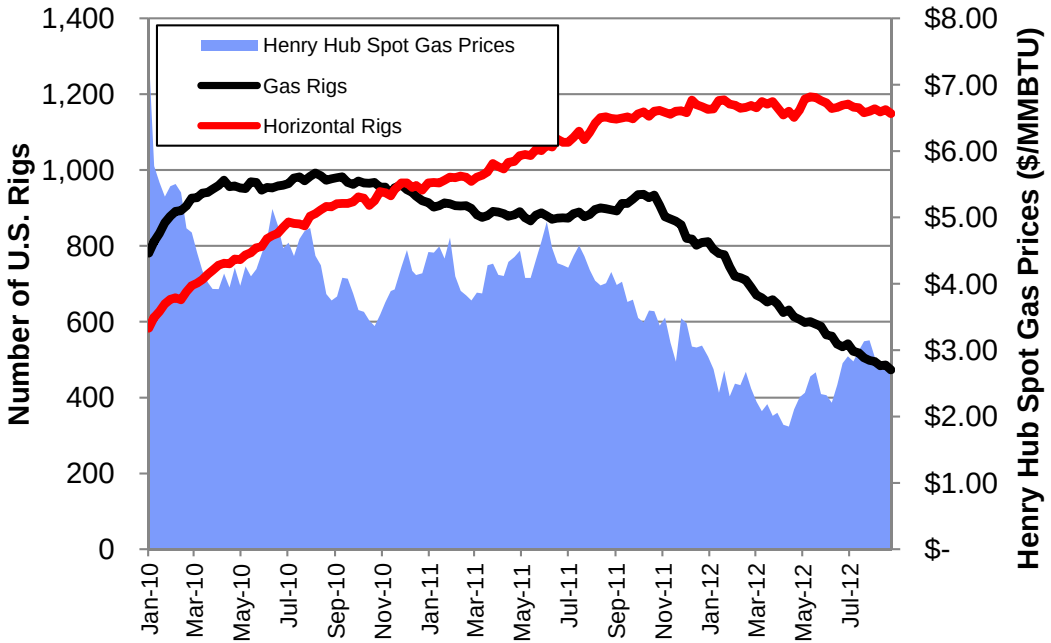
Drilling Pullback Started with Sub-$3 Gas

- Some producers are pulling back dry gas production
- Gas rigs are being repurposed for oil production
- Some recent announcements:
  - Chesapeake: "Bare minimum" levels
  - Conoco: Shutting in 100 MMcf/day
  - EQT: Suspends gas drilling indefinitely in Huron, coalbed methane plays in App. Basin
  - Quicksilver: Focusing on oil, liquids projects
  - Noble: Low price "circuit-breaker" tripped; suspending dry gas production in Marcellus until $4/MMBTU gas for three consecutive months
- Others are continuing, or at least remaining mum
- Curtailment or supply response?

LNG Safety Valve?

- Landed LNG in European hubs exceeds $8/MMBTU
- With transport and regas ~$2/MMBTU, prolonged low ($3) domestic gas prices could energize a U.S. LNG export market
- Varied opinions

Rig Count vs. Spot Gas Prices (Jan. 2010–Aug. 2012)



Lag effect: As recently as mid-February, domestic production was up from last year (nearly 20%) but trending downward, as Canadian imports and LNG imports have been reduced significantly (down nearly 30% and 50%, respectively, from Winter 2011). As rigs are reduced, one might expect a continued ramp-down in domestic dry gas production.

Sources: EIA; Baker Hughes; Energy Intelligence *Natural Gas Week*

Historical Flow Patterns Are Changing from Longitudinal (One Direction)…

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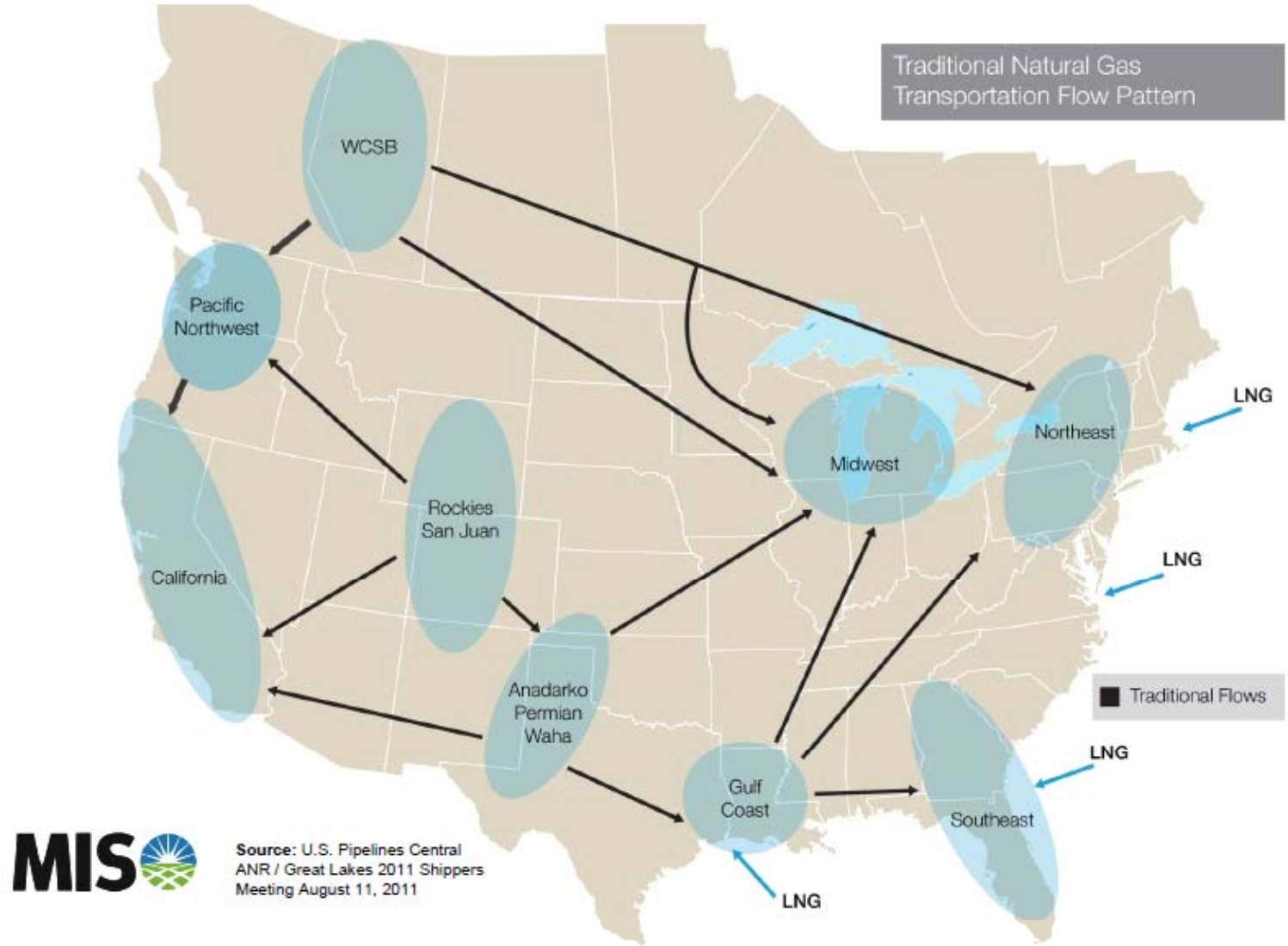
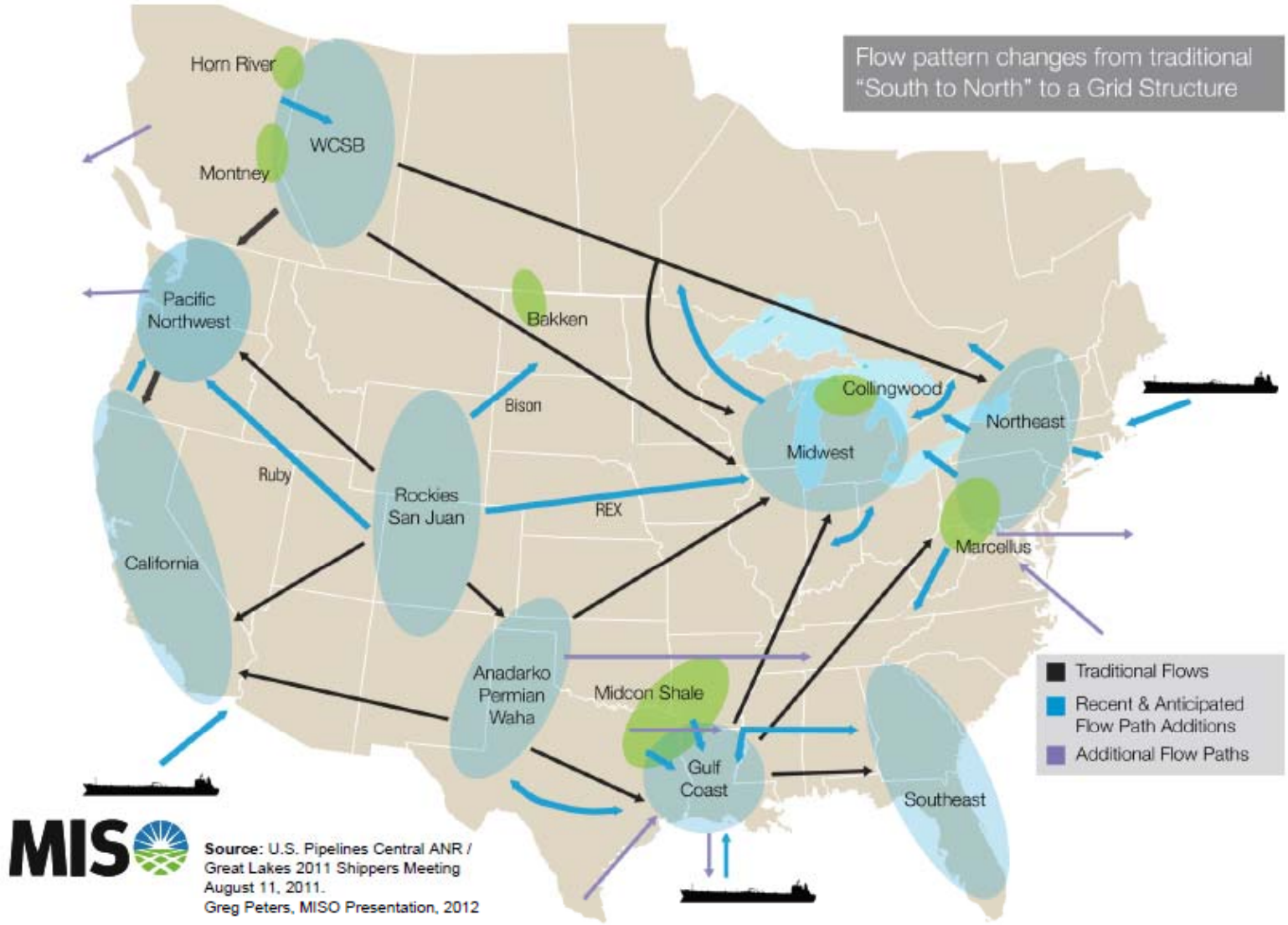


Source: Midwest ISO Gas-Electric Interedependency Workshop (May 10, 2012)

...To a Developing "Grid" Flow Pattern



Source: Midwest ISO Gas-Electric Interedependency Workshop (May 10, 2012)

Despite Excess Inventories, Low Gas Prices Have Tempered Interest in New Storage Capacity

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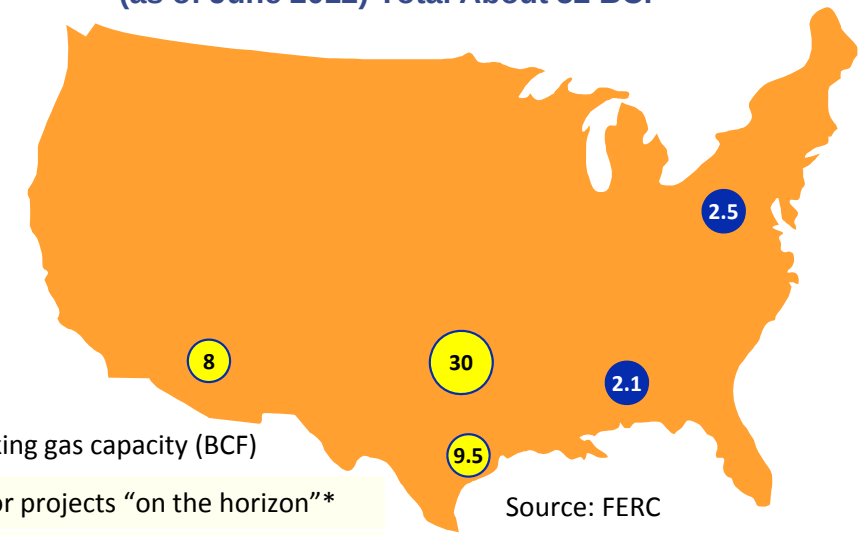
Pending and Announced Natural Gas Storage Projects (as of June 2012) Total About 52 BCF



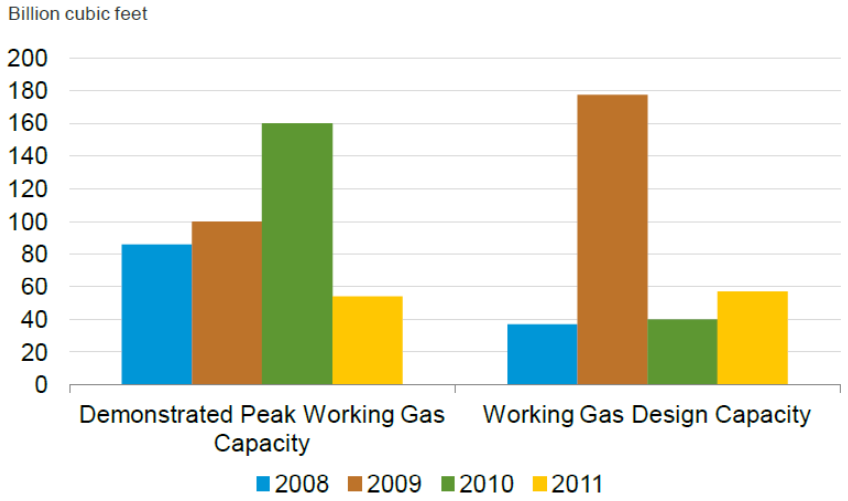
Working gas capacity (BCF)

Major projects "on the horizon"*

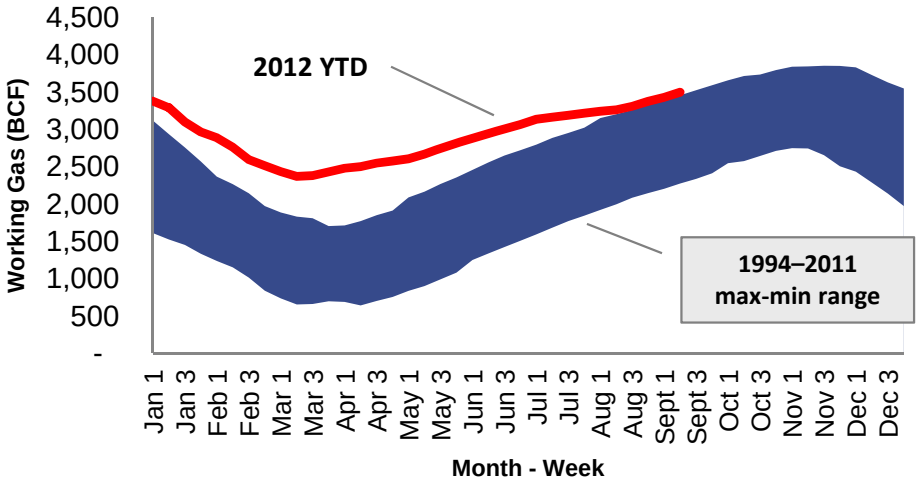
Pending projects*

Source: FERC

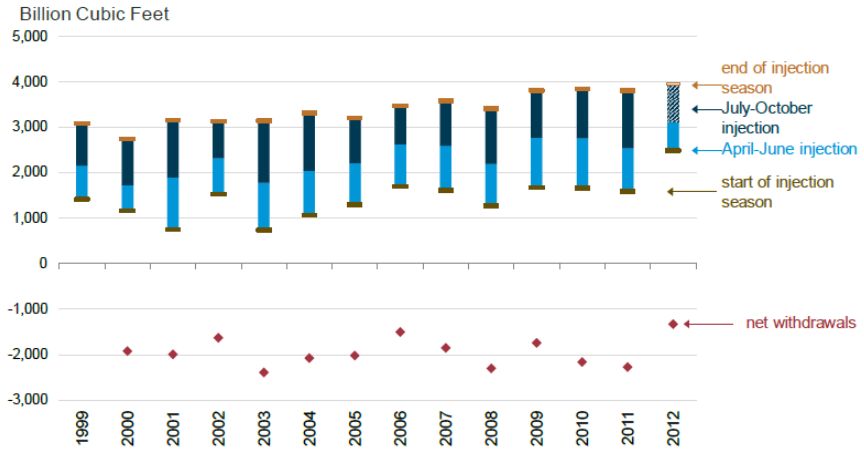
Working Underground Natural Gas Storage Capacity Additions (2008–2011)



Working Gas Weekly Underground Storage Volumes (in BCF) (1994–2011 vs. YTD 2012)



U.S. Natural Gas Injection Season (1999–2012)



Note: Net withdrawals occur during the heating season following the prior injection season (for example the 2012 net withdrawals are the 2011 end of the season minus the 2012 start of season

*Note: "On the horizon" are planned by storage companies and reported on in the trade press but have not been filed with FERC. Pending projects (new and enhancements) in which an application has been submitted, but final FERC decision has not yet been reached.

Sources: EIA, "Natural Gas Markets: Recent Changes and Key Drivers," at LDC Gas Forum (Sept. 2012); FERC Office of Energy Projects

Pipeline Infrastructure – Transmission

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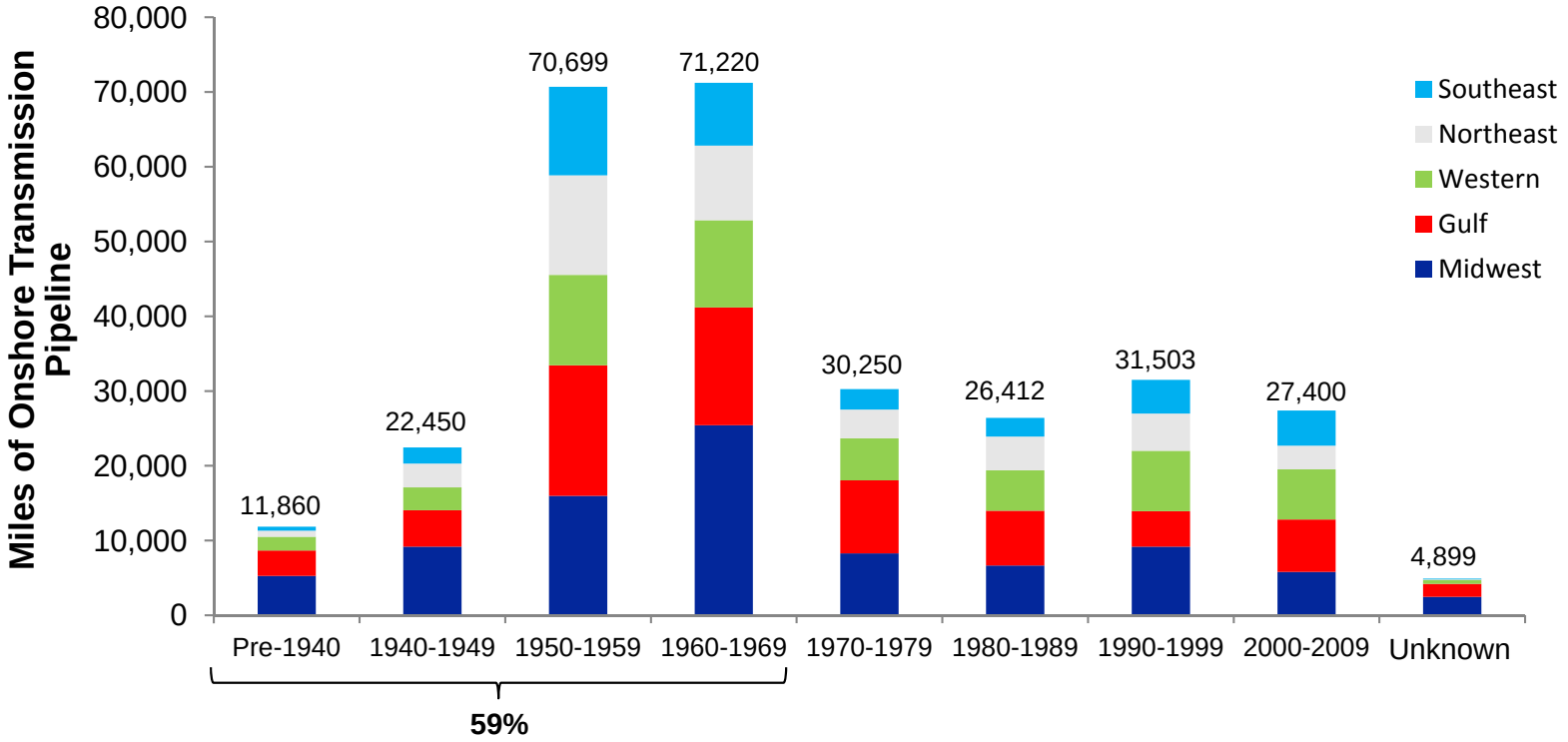
Onshore Gas Transmission Pipeline by Decade of Construction and by Region (Miles)



Transmission Pipelines by FERC Region

FERC Region	Miles of Main	% Older than 50 Years	Total # of Leaks, Onshore Transmission
Midwest	88,305	34%	480
Gulf	71,998	36%	488
Western	55,046	31%	147
Northeast	43,846	39%	327
Southeast	37,497	39%	185
Grand Total	**296,693**	**35%**	**1,627**

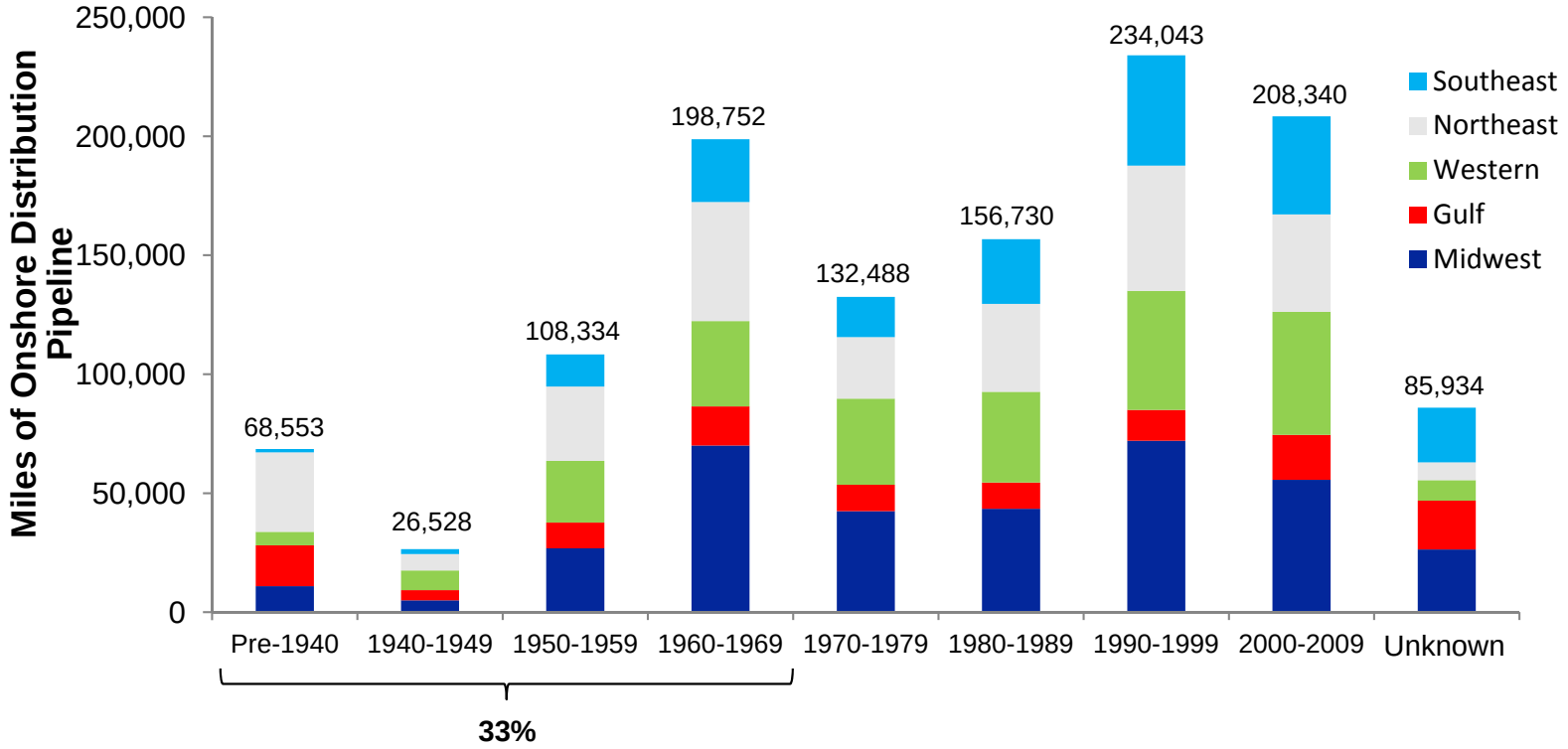
- Most of U.S. pipeline infrastructure is aging; 59% is 40 years or older. The 1950s and 1960s saw a significant level of construction
  - By comparison, the pipeline infrastructure is older than much of the U.S. highway system
- The Northeast and Southeast regions have the oldest transmission pipe, with 39% older than 50 years

Sources: PHMSA; ScottMadden analysis

Pipeline Infrastructure – Distribution

SCOTTMADDEN Management Consultants

Onshore Gas Distribution Pipeline by Decade of Construction and by Region (Miles)



Distribution Pipelines by FERC Region

FERC Region	Miles of Main	% Older than 50 Years	Total # of Leaks
Midwest	352,814	12%	128,875
Northeast	285,465	25%	186,630
Western	260,325	15%	95,705
Southeast	197,881	9%	76,393
Gulf	123,216	26%	65,395
Grand Total	**1,219,701**	**17%**	**552,998**

- Compared to transmission, the distribution infrastructure is newer; 33% is 40 years or older, and 49% constructed since 1980
- The Gulf and Northeast regions have the oldest distribution pipes, with 26% and 25% older than 50 years, respectively

Sources: PHMSA; ScottMadden analysis

Gas Pipeline Safety: A Priority

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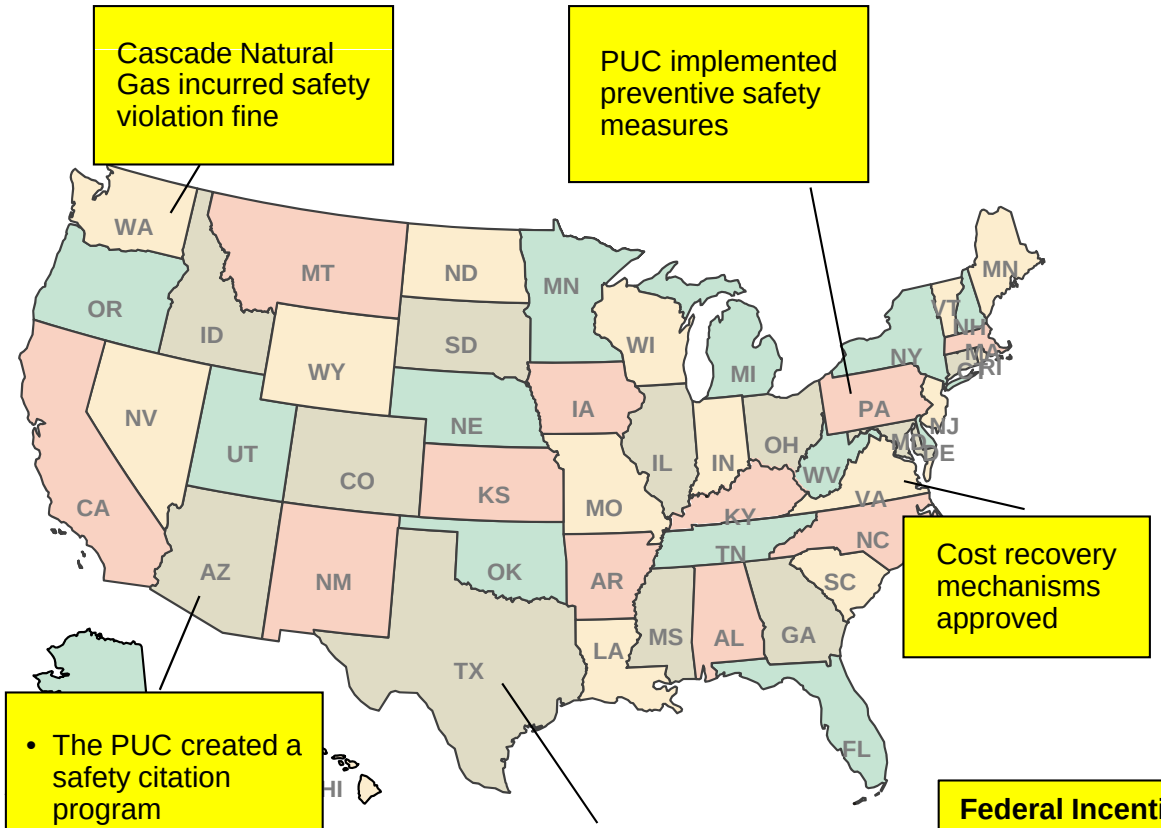
Selected Gas Pipeline Safety Incentives and Penalties



- The PUC created a safety citation program
- PUC required to consider a gas utility's safety performance when determining the utility's rates

The Railroad Commission implemented new penalty guidelines for violations of its oil and gas safety measures

Pipeline safety has become a top priority for the gas industry, driven by several trends over the past several years

- ❑ The abundance of shale gas and increasing dependence on natural gas as a supply source have created higher demand on some transmission pipelines
- ❑ Recent high-profile incidents have demonstrated that risks such as leaks, defects, and improper operations can have severe consequences
- ❑ 2008–2010 was marked with more than $650 million in damages from transmission onshore gas pipeline significant incidents and 87 fatalities (with 71 occurring in 2010 alone) out of 156 total incidents
- ❑ To meet a possible doubling of natural gas demand, an additional 24,000 miles of pipeline may be required. Gas companies will be major players in this future build-out of transportation infrastructure for power generation

Federal Incentives

Pipeline Safety, Regulatory Certainty and Job Creation Act of 2011

- Designed to strengthen safety requirements and inspections and clarify accountability for pipeline operators for accidents

Advance Notice of Proposed Rulemaking

- Requests the public to comment on whether gas transmission pipeline regulations should be strengthened. Potential changes include eliminating certain regulatory exemptions for pipelines constructed prior to 1970 and expanding integrity management

Sources: Washingtonwatch.com, Van Ness Feldman, SNL Financial; E. Baker & J. Davis, "Gas Pipeline Safety," available at www.scottmadden.com

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