



The Energy Industry Update

Highlights of Recent Significant Events and Emerging Trends

Winter 2012-2013

Vol. 13, Issue 1

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View from the Executive Suite

Executive Summary

Decision Time

The November 2012 elections did little to change the dynamics in Washington, and fiscal issues continue to dominate the national debate, as energy policy is overshadowed by—and caught in the crossfire of—dueling views on spending and taxation. The averted "fiscal cliff" promises to yield more policy debate in 2013 and beyond. Climate change and renewables, called out in the inaugural address as priorities, are sure to spark debate. Nonetheless, energy and utility companies face infrastructure investment needs and impending deadlines for plant retirements and retrofits and must push forward in developing and executing strategies, some of which were deferred pending November's electoral outcomes.

Efficiency and Growth	 Energy efficiency continues to drive year-over-year growth in energy demand lower; utilities are seeking alternative recovery mechanisms in this slow demand growth environment—sometimes also entailing lower allowable ROEs Some optimism remains that economic growth will pick up in 2013 and beyond, providing some tailwinds for energy companies, but more fiscal fireworks could cause a slowdown
Coal's Slow Burn	Anticipated coal-fired plant retirements continue to increase, spurred by EPA regulations and persistent low natural gas prices, while some owners will hold on (at least for a while) for various reasons: retrofit technology successes, performance of other plants, rate impacts, and reliability, and others are still deciding whether to retire or retrofit
	the Midwest as EPA deadlines and large volumes of plants stress capability to complete refurbishment in a timely manner
Consequences of a Natural Gas-Based Energy Industry	 Shale gas continues to be the major story in the U.S. energy picture, but there are risks to low gas prices (significantly increased demand, greater and multiple levels of regulation, pricing uncertainty/miscalculations) As power generation becomes increasingly dependent upon natural gas as a baseload or swing fuel source, federal and reliability officials are turning their attention to infrastructure adequacy and coordination of the gas and electric industries, increasingly important issues
Policy Shiftor Not	Changing personnel at the Department of Energy and the Environmental Protection Agency could alter policy; most, however, expect the trajectory and priorities of clean energy and increasing environmental regulation to remain substantially the same
	Federal renewables incentives (e.g., production tax credit) received a temporary extension and the dividend tax exemption was extended permanently, but it remains unclear how a contentious federal budget process might affect those policies in the longer term
	Meanwhile, FERC has offered clarification on criteria for granting transmission incentive rates. This provides some assurance for continued incentives in the near to medium term. Despite FERC's clarification, questions about incentive criteria remain

Economic Outlook: Cliffs Avoided, Growth, and What It Portends for Energy and Utility Companies



Possible Impact of Selected Fiscal and Economic Factors on Energy Utilities		
Factor	Outcomes & Uncertainties	Implications
Economic Growth	 Expected slow growth in early 2013 Modest acceleration in late 2013 or 2014 	 Continued growth in energy demand, but at a relatively low rate
Dividend Taxation	 Dividend tax exemption extended Obama Administration contemplating further unknown tax increases 	 Potential for dividend and other investment tax incentives to get caught up in tax reform discussion
Individual Income Taxes; Transfer Payments	 Rates increasing; tax burdens certainly increasing, but ultimate allocation of burden unclear Possibly reduced transfer payments (e.g., extended unemployment benefits) 	 Household budget pressures on ratepayers Increased demand for LIHEAP and other assistance programs Commission, ratepayer resistance to rate increases More frequent rate filings, smaller increments
Production Tax Credit	 Extension for one year; elimination or possible phase-out beginning in 2014 	 Final dash to renewables construction in 2013? Potential grants of relief in some states to near-term RPS deadlines
Carbon Tax	 Recently discussed as possible proposal; unlikely to be implemented in current Congress 	 Longer-term consideration Negatively affect coal-heavy utilities, but positive for renewables, nuclear Ratepayer resistance to pass-through
Capex Incentives	 Accelerated depreciation extended Potential withdrawal of "stimulus" 	 Limited impact on utility investment, given maintenance, replacement, and upgrade needs Demand a greater factor
Monetary Policy	 Continued low Treasury rates, but Fed exit strategy unclear 	 Continued favorable financing costs, assuming spreads do not widen





While the immediate "fiscal cliff" talks yielded an interim deferral of some impending tax increases and spending reductions, key uncertainties remain as pending further rounds of contentious budget discussions play out in the next months and years.

The 2012 Election: How Might the Results Impact the Energy Industry?



Area

Renewables & Clean Energy



Current Views

- û Election outcome positive for renewable energy
- President Obama may push for a clean energy standard, but it is unlikely to get enough House votes or a filibuster-proof majority in the Senate
- ⇔ Likely that push for wind PTC renewal will be part of budget negotiations most expect one-year extension over next several months (a two-year extension currently proposed); further discussion in 2013
- $\hat{\mathtt{v}}$ Solar investment credit not likely to be rescinded before sunset in 2016
- Continuation of policy encouraging utility-scale solar development on large areas of federal land
- Continued promotion of aggressive renewable and efficiency targets at Department of Defense installations
- ⇔ Outright ban unlikely, but continuation of EPA drinking water study and guidance on fracturing process and possible restrictions on activities on federal lands could increase production costs
- ⇔ Near term, likely to remain primarily a state issue, but some risk of federal rules and/or exceptions including EPA's "green completion" regulation (expected in 2015) and the Interior Department's proposed chemicaldisclosure policy on federal lands
- Split Congress likely limits comprehensive GHG legislation
- ⇔ Obama and Reid comments on new focus on climate creates some possibility of a carbon tax in any budget "grand bargain" – a "sleeper" issue
- ⇔ Possible expansion of GHG controls via regulation of existing facilities

Sources: Bracewell & Giuliani Legal Blog, "Top Energy and Environment Issues in the Wake of the 2012 Election" (Nov. 13, 2012); Foley & Lardner webinar, "The Future of Energy Policy Post-Obama Election" (Nov. 16, 2012); Chadbourne & Parke LLP webinar, "Post-Election 2012" (Nov. 16, 2012); "What Obama's Victory Means for Business," *Wall Street Journal* (Nov. 8, 2013); "Who Will Succeed Energy Secretary Steve Chu at DOE?," greentechmedia.com (Nov. 19, 2013); Bloomberg Government, "Post Election Assessment: What's at Stake for U.S. Energy Policy" (Nov. 7, 2012); SNL Financial; industry news; ScottMadden analysis

Shale Gas & Hydraulic Fracturing



Climate Change & Carbon Regulation



The 2012 Election (Cont'd): How Might the Results Impact the Energy Industry?



Sources: Bracewell & Giuliani Legal Blog, "Top Energy and Environment Issues in the Wake of the 2012 Election" (Nov. 13, 2012); Foley & Lardner webinar, "The Future of Energy Policy Post-Obama Election" (Nov. 16, 2012); Chadbourne & Parke LLP webinar, "Post-Election 2012" (Nov. 16, 2012); "What Obama's Victory Means for Business," *Wall Street Journal* (Nov. 8, 2013); "Who Will Succeed Energy Secretary Steve Chu at DOE?," greentechmedia.com (Nov. 19, 2013); Bloomberg Government, "Post Election Assessment: What's at Stake for U.S. Energy Policy" (Nov. 7, 2012); SNL Financial; industry news; ScottMadden analysis

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Utility Investment Outlook: Analysts' Views



Views of Selected Utility Industry Subsectors by Various Investment Research Houses and Rating Agencies

Sector & Outlook	Headwinds $\[mathcap{l}]$	Tailwinds û	Uncertainties ?
Investor-Owned Electric Utilities Stable credit ratings Market perform	 Continued softness in earnings No "game-changing catalyst on the horizon" Valuations expensive on absolute basis and relative to broader market Cyclical and structural slowing of energy sales growth Pension issues with changes in actuarial assumptions and low investment returns 	 Investor appetite for stable, high dividend yields and conservative equity option Extension of dividend tax rates Unexpectedly hot summer in some U.S. regions boosted demand Solid liquidity—strong capital market access and low rates Low wholesale power prices Stable regulation (but downward trend in ROEs) 	 Higher interest rates may make yields less attractive, but "that doesn't appear to be in the cards" Long lead-time projects, regulatory delays in rate recovery, and pressures on allowable ROEs
Public Power, Municipals, and Cooperatives Stable credit ratings	 Continued environmental uncertainty Depressed wholesale prices (for publics/coops that augment revenues with market sales) Continued fiscal stress for municipalities; risk of need for higher financial support from munis to local governments 	 Rate-setting authority Reliable cash flow Low natural gas (fuel) costs Continued relative capital cost advantage Conservative business model Proactive increases in rates to meet increased costs 	Willingness to raise rates to support increased costs, given continued economic weakness, political risk of doing so
 Natural Gas Distributors Stable credit ratings Market perform to outperform 	Increased focus, cost of pipeline, and system safety	 Stable, high dividend yields Extension of dividend tax rates Low natural gas prices (minimize customer conservation) Reduced liquidity needs: lower cost of gas in storage, customer receivables Customer growth from housing builds, conversions 	Weather variability
Competitive (Merchant) Generators • Negative ratings outlook • Market perform	 Extended trough for wholesale power prices (but some analysts say gas-dependent merchants well positioned for near to medium term) Expiration of above-market legacy hedges Capital markets for high-yield issuers volatile; capital market access issues 	Vertical integration into retail provides some counter-cyclicality	 Potential natural gas price rebound Potential consolidation among gencos Fuel type and diversity, regional differences

Energy and Utility Company Stock Prices: Some Buoyancy Despite "Cliff-Diving"

Over Five-Year Horizon, Electrics and Merchants Trail the Dow, But Small Diversifieds Still Outperforming

Selected Stock Index Values (Jan. 2008–Dec. 2012) (Index: Jan. 1, 2008 = 100%)



- The fiscal cliff did not yield a huge sell-off in utility stocks, and utilities remain a key—but not the only—option for investors seeking income, thus preserving its investment attractiveness
- However, one investment bank believes 2013 will see "continued poor stock performance for many diversified utilities, driven by credit concerns, retail margin weakness, and regulatory issues"*

Sources: SNL Financial; *Morgan Stanley; ScottMadden analysis

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Gas MLPs Moving Toward Industrials

Selected Stock Index Values (Jan. 2010–Dec. 2012)



More Recently, Gas Sector Is Coming "Back to Earth"

Selected Stock Index Values (July 2011–Dec. 2012)



Energy Supply, Demand, and Markets

Reduced Energy Demand: Cyclical or Secular?



Manufacturing Energy Use Has Declined, But Mix of Causes?

Energy Consumption vs. Selected Measures



Growth in Retail Sales Appears to Be Flattening

Residential Energy Usage and Cost per Square Foot Declining



- Despite increasingly larger residences, energy consumption per square foot has been declining
 - Key factors include building codes, improved technology, and efficiency programs
 - Conservation behavior, due to slow economic growth and high unemployment, may also be playing a part
 - While electricity consumption as a proportion of energy type has increased (air conditioning, electronic devices, etc.), power consumption per household has increased by 22% since the 1970s while average home square footage has increased 46%
- □ Electricity sales growth remains stuck at sub-1% levels with risk of declines if price/rate levels or volatility increase
- Manufacturing energy trending similarly due to technology improvements, although it is unclear what the impact of cheap natural gas will be on levels of consumption
- □ Aging and replacement of housing stock and equipment will continue to drive much of this trend

Sources: EIA, 2009 Residential Energy Consumption Survey, 2010 Early Release Estimates, Manufacturing Energy Consumption Survey, and Annual Energy Outlook; ScottMadden analysis

Energy Efficiency: Slowly Forcing Changes to the Utility Model?

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- Energy efficiency resource standards (EERS) and goals are moving forward in many states, although new EERS are not pending
- Even without direct mandates like EERS, indirect effects from federal efficiency mandates such as lighting efficiency and Energy STAR, building codes, and improved materials and technologies (e.g., LEDs), continue to reduce energy intensity
- Fitch considers energy efficiency "a significant threat to the credit profile of the electric utility sector and the first major challenge to the otherwise monopolistic utility franchise"
- Increasingly, utilities will have to develop business and regulatory models that provide a return on investment in demand-side energy infrastructure

...While Revenue Recovery Mechanisms May Not Align

Lost Revenue Adjustment and Revenue Decoupling Mechanisms for Electric Utilities (as of July 2012)



Timing of Selected DOE Appliance Efficiency Standards

Appliance/Equipment	Issued	Effective
Boilers	2007	2012
Central Air Conditioners	2011	2015
Ranges and Ovens	2009	2012
Refrigerators	2011	2014
Water Heaters	2010	2015
Commercial Boilers	2009	2012
Commercial Air Conditioners, Heat Pumps*	2012	2013
Commercial Refrigeration Equipment	2009	2012
General Service Lamps (incl. Fluorescent, Incandescent, and CFLs)	2007, 2009	2012

Note: *Water- and evaporatively-cooled

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Sources: DSIREUSA; Institute for Electric Efficiency; DOE Appliance Standards Awareness Project; FitchRatings

NERC's Latest Long-Term Reliability Assessment: Some Good News and Some Cautionary Notes

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About 44 GWs of Planned Fossil Retirements with 26 GWs More Projected by NERC by 2022

NERC-Wide Cumulative Summer Fossil-Fired Capacity Resource Retirements



2012 Key Reliability Findings

Planned Transmission Additions Over Next Five Years Far Exceed Any Prior Five Years' Miles of Additions

Historical Actual Miles Added for Rolling Five-Year Periods and Projected Five-Year Plans (200 kV and Above)



Finding and Impact	Commentary and Considerations
Transmission growth to accommodate new and distant resources	 18,700 miles (>200 kV) are planned over the next five years—triple the circuit miles constructed during any five-year period Delays could impede plans; reassessment of load growth accounts for more than 40% of delays/defers
Renewable resources additions introduce new planning and operational challenges	Integration issues plus concern about peak availability, with 20 GWs of <u>on-peak</u> planned renewable capacity, 21.5 GWs of <u>on-peak</u> "conceptual" capacity
Significant fossil-fired generator retirements over the next five years	 NERC estimates nearly 71 GWs of retirements by 2022, with 90% of that retiring by 2017 Estimates are highly uncertain, as generation owners are still evaluating options and many have not announced retirement decisions. Per NERC, about 44 GWs of retirements are confirmed based upon announcements and resource plans Next three or four years may see system stability issues in some areas, need transmission enhancements

NERC's Latest Long-Term Reliability Assessment: Some Good News and Some Cautionary Notes (Cont'd)





Regional Variation in NERC's Outlook— Trouble in Texas

ERCOT's Anticipated Reserve Margin below NERC Reference Margin Level in every year and is zero by 2020 unless more capacity is added

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- NERC fears that capacity deficiencies could trigger emergency operating procedures that may include the shedding of firm load
- While acknowledging some progress, NERC "strongly recommends" the Texas PUC and ERCOT develop policies that bring capacity online in near and long term

NERC's Latest Long-Term Reliability Assessment: Some Good News and Some Cautionary Notes (Cont'd)



Regional Variation in NERC's Outlook— Expanding Concerns But Less Urgent

- Longer term, reserve margins begin to fall below reference levels in some other regions
- □ These regions (except ERCOT) have at least five years to enhance capacity
- "Conceptual resources"—generation in early stages of assessment—not considered for the reserve margin forecast, could be sufficient to aid regions including WECC, PJM, and Ontario, but their eventual construction is uncertain



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Potential Coal Plant Retirements: The Latest Tally

Selected U.S. Coal Plant Retirement Forecasts: 30 GWs to 100 GWs between 2015 and 2020

Analyst	Projected Retirements
Union of Concerned Scientists	59 GWs "ripe for retirement" in add'n to est'd. 41 GWs announced (100 GWs total)
Brattle	59–77 GWs
Sanford Bernstein	58 GWs by 2015
Bipartisan Policy Center	56 GWs by 2016
Friedman Billings Ramsay	50–55 GWs by 2018
Guggenheim Partners	50 GWs by 2015
ICF	50 GWs by 2015
EIA	49 GWs by 2020
Reuters/Factbox	35 GWs by 2015
Wood Mackenzie	30 GWs by 2015, add'l 45 GWs by 2025

Announced Coal-Fired Plant Retirements as of Aug. 2012 (30 GWs through 2021)



- **Regulatory "tsunami":** With re-election of President Obama, the "tsunami" (no longer "train wreck") of EPA regulations affecting power generation is now expected to be promulgated and implemented
- Gas vs. coal: The story remains centered on the natural gas vs. coal price differential, as natural gas prices continue to remain low by historical standards. Meanwhile, coal mines have ramped back production in response to lower demand, and production costs are rising in response to increased mining regulation
- Regional impacts: EIA projects that most retirements will be older, inefficient units concentrated in the Mid-Atlantic, Ohio River Valley, and Southeast, which have excess capacity. The Midwest ISO could be particularly affected by a large number of unit retirements
- East vs. West: Generation using lower sulfur Powder River Basin (PRB) and Illinois coal is expected to fare better than Appalachian coal-fired plants. Coal producer Peabody Energy estimates that PRB is competitive with \$2.50 to \$2.75/MMBTU natural gas, while for Illinois it is \$3.25 to \$3.50 and \$4.50 for Appalachian coal

• "Unretirements" and temporary deferrals: Some utilities may reconsider retirement of selected coal plants for varied reasons

- Detroit Edison, e.g., told regulators that it planned to keep some (albeit large) units open that it had originally slated for closure as new controls technology works better than projected
- Otter Tail Power is delaying retirement of its Hoot Lake plant from 2015 to 2020 to reduce ratepayer impacts
- TVA has had to delay idling of five coal units because of unanticipated operating challenges at a large pumped storage plant
- At PJM's request, First Energy delayed some unit retirements to 2015, pending upgrades, in order to provide voltage support

U.S. Nuclear Power: Latest Developments



NRDC/Riverkeeper: \$1/month

Summer costs increase slightly:

SCANA granted return on CWIP

Manhattan Institute: \$100/year

Summer is expected online in 2017–18

SCANA has identified \$283 million increase due to

transaction costs, staffing, and EPC contract changes

- □ Yucca flux: Used fuel strategies remain in limbo with the cessation of work on Yucca Mountain
 - An appeals court decision caused NRC to suspend, at least for a while, new reactor license decisions, pending resolution of waste issues
 - As a result, NRC has initiated a two-year "waste confidence" environmental impact assessment of used fuel storage at shutdown sites
 - In January 2012, a Blue Ribbon Commission made recommendations for future waste disposal siting; congressional follow-up is still pending
- Small modular reactor (SMR) interest: DOE has indicated interest in SMRs with a modest but meaningful grant of \$67 million for SMR R&D and TVA has partnered with DOE to assist with SMR technology development
- Decommissioning funding: NRC issued new guidelines for decommissioning—specifically regarding low-level waste—which the industry believes will increase those costs by \$120 million per reactor
- Post-Fukushima regulatory framework: NRC is considering a more integrated regulatory framework (decision in 2013), including:
 - Role of voluntary industry initiatives
 - Decision process for determining appropriate safety margins
 - Addressing beyond-design-basis matters
- FLEX: Some plants are participating in an NEI FLEX program in which each facility receives additional back-up generators and emergency batteries averaging \$1 million per plant



other single-unit stations?

OPPD hires Exelon to provide day-to-day operations management of Ft. Calhoun station, citing Exelon's "Management Model and proven best practices"

SONGS reliability questions remain: 2,254 MWs of capacity remains offline due to unexpected steam generator tubal wear

> Exelon withdraws Victoria application, citing low natural gas prices and unfavorable economic and market conditions

econo

Vogtle costs increase but...:

- Vogtle 3-4 are still expected online in 2016–17
- Total costs is now projected at \$6.2 billion, still below the nearly \$6.45 billion initial estimate
- Southern is now engaged in formal dispute with contractor over additional cost, schedule
- Additionally, a pending DOE loan guarantee agreement continues to be unresolved

Crystal River cost evaluation:

- Progress has received \$40 million in uprates and requested an additional \$9 million
- Florida's PUC deferred decision to 2013 citing ongoing difficulties and uncertainty of current repairs

Levy County going forward:

- Duke voiced to Florida's PSC a continued commitment to new Levy County nuclear plant
- Expects to be online by 2024

new reactor
 existing reactor

Shale Gas: Risks to Bullish View



- Production curves (output yield from fields and wells) vary within and across various shale plays
 - Some skeptics point to rapid decline rates
 - No "one-size-fits-all" assessment of shale play productivity; assessments still evolving
- Reserves and ultimate supply are smaller than technically recoverable resources—a key question is how much at what price
- Externalities—and responses thereto—could play a role in slowing development
 - Stringent EPA regulation or local opposition, such as New York's ban on fracking, could make availability of the shale resource moot
- Economics are brutal in the current environment
 - Series of write-downs on North American shale stakes by BHP Billiton (\$2.84B), BP (\$2.1B), BG (\$1.3B), and others as "land rush" meets \$3 natural gas prices
 - While current gas prices offer breakeven for some wet plays, most dry gas is not in the money at \$3
- □ Water consumption remains a concern in some areas
 - Water usage rates in recently drought-prone areas like Texas are emerging as a point of concern
 - Industry proponents, however, point to the large percentage of water consumed by municipalities and irrigation





*Based upon paper for Society of Petroleum Engineers and assuming EURs as of 2009 **Monthly futures prices as of Oct. 23, 2012

Notes:

Sources:

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The American Oil & Gas Reporter (May 2011); World Oil (July 2012); UBS Investment Research, "NYT Shale Gas Allegations Seem Exaggerated" (June 27, 2011); industry publications

Power Plant Replacement and Retrofit Supply Chain: Timing Is Everything

With EPA compliance deadlines (esp. MATS*) approaching, the power plant construction and maintenance supply chain will be stretched

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- Both significant new construction (replacement of retiring units) and retrofits will be occurring contemporaneously
- Retrofit windows will be limited—shoulder months and perhaps some winter outages
- Compliance is required by Q1 2015, with possible extensions into early 2016, leaving only about 24 to 36 months to complete
- Per a MISO-commissioned study, the most single-year retrofits and new build of 89 GWs**, which it deems a "soft cap"

Available skilled labor supply may be stretched thin

- A shortage of skilled labor persists, despite relatively high construction unemployment (11+% as of 3Q 2012)
- This is manifesting itself in increased cost: craft labor is seeing a gradual, nationwide increase in wages and fringe benefits
- Boilermakers in particular could be in short supply: MISO found that 10% of boilermakers are in utility construction. while retrofit/build workload will require about 30% of all boilermakers over the next several years

Contractor performance and liquidity should be monitored

- Increased competition and aggressive bidding on projects has increased risk of liquidity and performance issues with general and sub-contractors
- Rising materials costs exacerbate this risk

*Mercury and Air Toxics Standard; **normalized as wet FGD-equivalent MWs

Sources: Midwest ISO-The Brattle Group, "Supply Chain and Outage Analysis of MISO Coal Retrofits for MATS" (May 2012): Power Advocate, Cost Intelligence Report for the Energy Industry (Nov. 2012): EEI: EPA: Engineering News-Record: ScottMadden analysis









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Infrastructure Investment Continues

Investor-owned electric utilities continue to invest in transmission and distribution (T&D) systems, for upgrades, reliability, and new build—at least 22 electric rate cases pending as of mid-December identified T&D system enhancements as a driver

Grid Resiliency in the Spotlight, But at What Cost

- Meanwhile, a spate of major weather events in 2011 and 2012—most recently Hurricane Sandy—has renewed calls to harden T&D system infrastructure
- Recovery of storm restoration costs has become contentious, as perceived slow response to extraordinary events causes some commissions to resist recovery requests and sparks debate over privatizing the Long Island Power Authority
- Discussion of undergrounding of lines has reemerged (last "wave" of discussion was in the mid-2000s after major hurricanes)
 - Sandy's impacts on the ConEd system demonstrated that undergrounding is not a panacea
 - Maryland and D.C. have each commissioned studies of undergrounding
 - However, at 5 to 10 times more costly per mile vs. overhead lines, undergrounding may be prohibitive and consumers may be unwilling to accept increased rates, especially as load growth continues to be flat

Widespread T&D-Influenced Rate Case Activity

Number of Rate Cases by State with Transmission or Distribution



A Bad Stretch: Weather Events Stress the U.S. Grid

Sweltering heat, violent An unusual early fall thunderstorms cause snowstorm causes widespread outages in extended outages in the the Midwest Mid-Atlantic Q2 Q2 Q3 Q1 Q3 Q4 Q1 Q4 2012 2011 2011 2011 2011 2012 2012 2012 Hurricane Irene causes A derecho moves from Hurricane Sandy the Midwest to the large-scale damage in strikes the Midthe Northeast D.C. area Atlantic

Rate Case and Regulatory Activity: Grid Costs and Reliability in Focus (Cont'd)



- Amid the ongoing low interest rate environment, allowed returns on equity (ROE) continue to fall
- In an effort to rein in rate awards, some commissions are requiring more frequent rate cases, while utilities continue to seek automatic adjustment mechanisms to combat regulatory lag
- There is continuing divergence of transmission and other utility businesses with regard to regulatory construct and returns. Transmission ROEs remain above 12% in many regions, formula rates remain commonplace, and FERC recently reaffirmed its transmission incentive ROE policy
- With slow or declining load growth, some utilities contemplate partial decoupling mechanisms or similar strategies; many jurisdictions have these in place
- However, these alternative rate structures can impact allowed ROEs because of the perceived reduced revenue risk for the utility. Peer comparisons for making those "adjustments" are becoming more complicated as peers may also have decoupling or similar mechanisms
- On the horizon, further activity to recover increasing costs of system hardening, infrastructure upgrades, and pension and benefits

Electric Transmission: Some Driving and Restraining Forces

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Driving Forces

- FERC recently reaffirmed and clarified its incentive rate policy
- Continues to provide solid returns (>12% ROE) when compared to distribution (~10%)
- Aging infrastructure presents ongoing opportunities
- Coal retirements are driving the need for new projects
- Renewables driven both by economics (read production tax credit) and renewable portfolio standards will require interconnection



Restraining Forces

- □ Load growth has slowed due to the recession and weak recovery
- Energy efficiency and demand response continue to impact load growth and peak loads
- □ Energy intensity is increasing
- Distributed energy resources are proliferating in certain regions
- Siting and lack of federal backstop authority slow development
- Retail rate pressure continues, exacerbated by the weak economy
- Compliance filings suggest that elimination of the right of first refusal will require significantly more work; no clear path to new development by non-incumbents in many regions
- Timing of implementation of EPA standards limiting coal will challenge transmission development; lack of clarity has cascading effects
- Electric and gas convergence presents new contingencies in the planning process and reliability concerns in certain regions
- □ Timelines for deployment of supply side alternatives are significantly shorter than for transmission (distributed energy resources, demand response, energy efficiency, gas-fired generation), further complicating planning



Elements of Incentive Rates and Some Recent Developments			FEF	C Policy Statement on Transmission Incentives
Base ROE		Was challenged in New England; FERC staff recommended reduction from 11.14% to 9.66% in a "new normal" economy; Commission decision pending		On November 15, 2012, FERC issued a policy statement for transmission incentive rates which: — Is no longer limited to "routine/non-routine"
Incentive ROE		Have been granted sparingly though some projects have received them for joining an RTO, project specific risk, independence Base ROEs plus incentive adders have generally been in the 11% to 12% range (for projects)		analysis — Applies an enhanced "nexus" test — Encourages joint ownership The policy now requires four showings: — The proposed project faces risks and
Recovery of Abandoned Investment		PATH example: Opponents have already begun challenging what if any portion of the \$225 million in development costs come from ratepayers; some have sought disallowances of some expenditures as "imprudent" Other cases may be on the horizon		 challenges that are not either already accounted for in the applicant's base ROE or through risk-reducing incentives Applicant is taking appropriate steps to minimize its risks during project development
CWIP in Rate Base		Consistently granted Removal or limitation of CWIP in rate base could stress profitability and liquidity of developers of major, long lead time projects		 Alternatives to the project have been, or will be, considered in a transmission planning process or other appropriate forum An applicant commits to cost containment by limiting the application of the incentive rate of
Formula Rates		These have grown commonplace and as a result are changing the way even integrated utilities manage O&M and capital expenditure Many states have retail riders		return to a cost estimate (with a provision for revisiting estimates to address cost increases that are outside the control of the applicant)

Formula transmission rates with transmission incentives (including adders for RTO participation) have generally reflected returns on equity from the mid-10% to upper-13% range

Gas-Power Interdependence: Implications of the "Dash to Gas"



Divergence of Fates of Coal- and Gas-Fired Generation





For Power, Natural Gas Is Increasingly in Demand

Daily U.S. Natural Gas Burn for Power Generation: 2005–2011 vs. 2012 (through Sept.)



Historic "Longitudinal" Flow Pattern Shifting to Today's Developing "Grid" Flow Patterns





Sources: EIA, "Natural Gas Markets: Recent Changes and Key Drivers," at LDC Gas Forum (Sept. 2012); Midwest ISO gaspower workshop (May 2012) www.midwestiso.org/Events/Pages/GE20120510.aspx; NERC gas-power interdependence report (released Dec. 2011) www.nerc.com/files/Gas_Electric_Interdependencies_Phase_I.pdf

Gas-Power Interdependence: Regional Differences Mean Different Concerns





Gas-Power Interdependence: Regional Differences Mean Different Concerns (Cont'd) <u>ScottMadden</u> Management Consultants



Renewables, Clean Tech, and Energy Technologies

Curtain Call for the Production Tax Credit and Shifting Paradigm for Wind Development?



The PTC Remains Essential to the Wind Industry

Estimated Total System Levelized Cost of Energy (LCOE) for New Plants in Service in 2017 (2010\$/MWh)



As the clock ran out on 2012, "fiscal cliff" negotiations yielded an extension of the 2.2¢/kWh renewable energy production tax credit (PTC), among other subsidies*

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- Projects "under construction"—a term subject to some interpretation—in 2013 can qualify for the PTC
- Effectively extends the credit for more than one year with the "commenced construction" deadline rather than a "placed in service" deadline
- Industry observers are not sure how many 2012 projects will be "construction-ready" by 2013, given continued economic uncertainty, good reserves in many areas, flat power demand, and low wholesale electric prices
- One analyst projects 1.2 GW in new wind installations for 2013 versus a record 12 GWs to 13 GWs in 2012, as developers moved to complete projects given uncertainty about PTC renewal for 2013. Projects completed or "planned for completion" for 2012 went from about 5 GWs projected at the end of 2011 to more than 12 GWs estimated as of late November 2012
- □ The extension provides temporary clarity, but doesn't solve fundamental long-term uncertainty for the industry, which has experienced start-stop subsidy support, leading to boom-bust construction cycles
- AWEA, the wind industry lobby, has indicated a willingness to phase out the PTC over several years (ending after 2018), perhaps in response to D.C. talk of fiscal austerity and technology advances and related cost improvements
- □ Looking to a possible future post-PTC era, one observer forecasts meaningful changes for the wind industry
 - *Financing structures:* Fewer debt/tax-focused schemes and more traditional project financing
 - Deeper pockets: Developers will need to have larger balance sheets as activity slows
 - Customer-oriented models: Less develop-and-flip activity, more tailored services such as resource shaping and firming

Note: The investment tax credit and bonus depreciation for renewables were extended as well Sources: REchargenews.com; Stoel Rives; Van Ness Feldman; American Wind Energy Association (AWEA): Dept. of Energy; *Power* magazine; *Forbes*; EIA; SNL Financial

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Absent Delays, State Renewable Portfolio Standards Should Support Some Renewables Development





- Compliance deadlines for renewable and alternative portfolio standards in some states are rapidly approaching, while only 164 TWh (~4%) of net generation in the United States in 2011 was from non-hydro renewable resources
- About half of RPS states have solar carve-outs, but in most cases those volumes are modest
- California, PJM, several Western states, and the Midwest have significant RPS compliance requirements beginning in 2020
- In addition to development, one key to compliance will be the availability of renewable energy certificates, with some utilities likely banking certificates to meet near-term needs
- However, 2013 development may be slower as uncertainty about production tax credit extension either froze or pulled development into 2012

 Notes:
 *Includes utility/IPP combined heat & power, excludes industrial, commercial generation

 Sources:
 Center for Climate and Energy Solutions; DSIREUSA.org; EIA



0% 10% 20% 30% 40% 50%

Utility/IPP Non-Hydro Renewable Net Generation* as % of Total (2011)



0%

10%

20%

30%

Wind O&M Costs: Increasing Focus But Costs Remain Low



- □ One estimate put U.S. wind farm O&M at \$2.7 billion in 2011, with the expectation that it will double by 2025
- □ The worldwide wind fleet, however, is not homogeneous; it varies by ownership, technology, size, manufacturer, and geographic dispersion
- Early U.S. installations using smaller, kW scale technologies are more likely to be candidates for repowering or retirement than for continued O&M
- For newer turbines, technical advancements and better siting and management of farms has improved service performance
- Some analysts see performance upgrades as an area for innovation and business growth

Headwinds for New Wind Construction

- □ The wind construction market is expected to slow in 2013 given the stop-go production tax credit dynamic
- Low natural gas prices have driven the spot electricity prices lower, which are compared to PPA prices for breakeven/cost-effectiveness of new build
- The gap between state renewable portfolio standards and qualified generation capacity is narrowing in many states
- Mostly limited progress on expediting new transmission build to "unlock" new wind generation from high-resource availability areas

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Wind Assets Aging by the Year



Selected Utility Estimates of Wind O&M Costs

Puget Sound Energy	\$40,000 to \$70,000/year for five-year-old, 1-MW turbine (about 1¢ to 1.5¢ per KWh)
Oklahoma Gas & Electric	 20% failure rate on major components requiring tower repair or crane Industry estimate: Failures in gearboxes, main bearings, and generators that involve a cost from \$30,000/turbine (up tower repair) to \$500,000/turbine (requiring a crane)
Basin Electric	\$500,000/year budget for gearbox replacement
LADWP	\$5 million budgeted per year for 90 wind turbine generators; now to be increased 20%

Notes: *Converted at \$1.339/€1, the two-year trailing average exchange rate at Nov. 27, 2012

Sources: IHS Emerging Energy Research; Bloomberg New Energy Finance: Vestas Q3 2012 Investor Presentation (Nov. 7, 2012); Wind Energy Update, "Wind 0&M Market Overview 2012/2013" (Nov.2012); DOE-EERE, "Establishing an In-House Wind Maintenance Program" (2d ed. 2011); SNL Financial (at <u>center.snl.com/Resources/whitepaper.aspx?id=4294969809</u>)

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