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The ScottMadden Energy Industry Update

Highlights of Recent Significant Events and Emerging Trends

February 2011

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Executive Summary

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Enhancing Value	❑ The economy is brightening, as the world continues to dig out of the "Great Recession." Energy consumption has begun to recover, but only modestly ❑ Electric utility valuations have lagged the broader indexes; for some companies, this presents potential opportunities for reasonably priced acquisitions ❑ In this slow-growth environment, utility companies are looking for growth opportunities. Some options include both corporate mergers and acquisitions or asset acquisitions. Also, utilities are pondering behind-the-meter products and services opportunities as growth vehicles, enhanced by smart grid capabilities (if and when those capabilities come to fruition)
Diverging Trends in Costs	❑ Natural gas continues to be cheap and plentiful, with continued modest demand combined with plentiful resources, including shale gas ❑ These plentiful supplies, and the slow economic rebound, helped keep end-user gas and power costs tame in 2010. However, the broader trend is that energy is taking a larger proportion of the consumer "wallet" ❑ In the renewables sector, solar photovoltaic module costs continue to fall, little by little. However, the overall installed cost of solar remains high. Solar development, which had a strong 2010, continues to require significant subsidies to achieve grid parity
The Beat Goes On...in Regulation	❑ Regulatory activity continues in both the environmental and energy arenas ❑ The U.S. EPA continues to push tightening emissions requirements for power generators, with unknown impacts on reliability and price of energy. The Administration's rapprochement with business and concern about economic growth might lead EPA to delay implementation. However, various interest groups may use the courts to keep the regulatory "train" going ❑ FERC is engaged as well, focusing on more aggressive enforcement of reliability standards and also trying to resolve years-old issues regarding transmission cost allocation

Economic Outlook: Turning the Corner

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Economic Growth Is Picking Up

- Economic growth is expected to continue into 2011, aided by compromise over extension of tax credits and extended unemployment insurance benefits
- While some forecasts are quite bullish (4% to 5%), the median among economists is 3% for 2011

CFOs Are Optimistic but Cautious

- CFOs expect increased growth in both revenues and profits, but have a slightly negative view of business conditions
- Biggest concerns: healthcare costs, revenue growth, cash flow, consumer confidence, and corporate taxes
- There are fewer downside risks in the near term, as most believe a "double dip" has been avoided
- A key near-term risk to the world economy: a significant economic deceleration in China

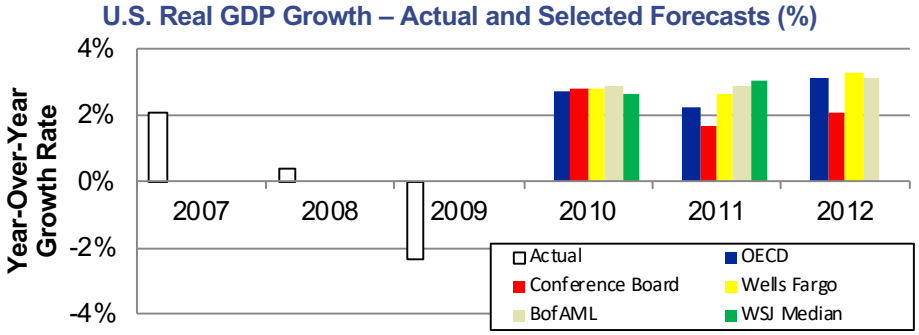
Capital Spending Expected to Increase

- Continued growth in capital investment is expected as credit loosened, especially for large firms, as well as tax incentives. This may bring forward some capex from 2012 into 2011
- M&A activity is expected to continue as well

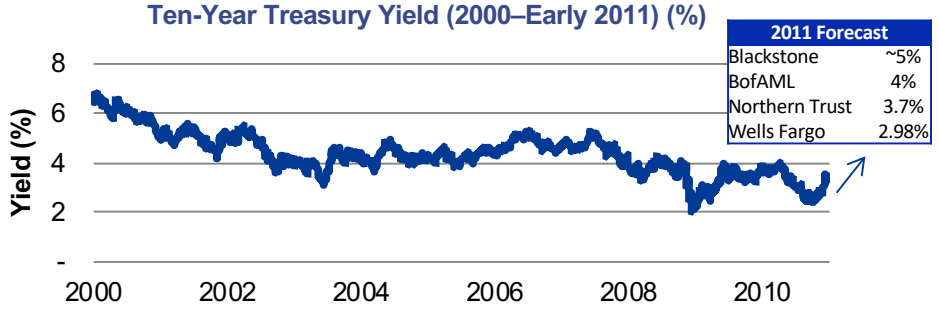
Interest Rates Are a Worry, Inflation Less So

- Increasingly, analysts are expecting interest rates to increase, especially as 60% of U.S. federal debt matures in the next three years and must be rolled over
- Rising rates are expected longer term: By 2020, OECD expects a large gap between savings and investment needs, especially as investment in developing countries accelerates
- Core inflation has faded as a concern, but some key raw materials and food prices are rising, as developing countries post strong economic growth

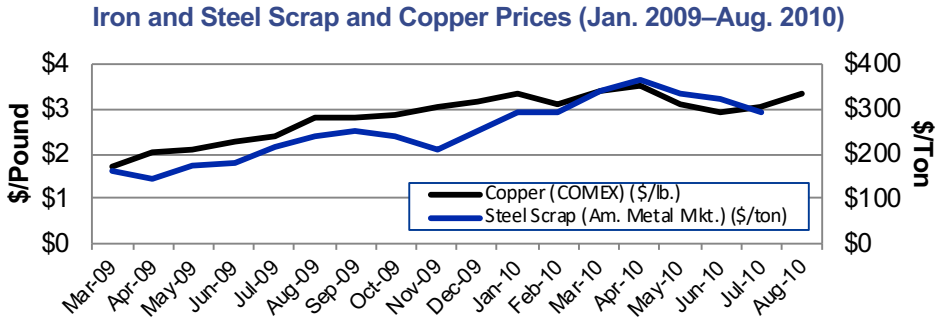
U.S. Economic Growth Accelerates Into 2011



Interest Rates May Increase Sooner Than Expected



Commodity Prices Are on the Rise



Sources: OECD; IMF; *Kiplinger's*; *Wall Street Journal*; Wells Fargo; The Blackstone Group; Bloomberg; Northern Trust; Bank of America Merrill Lynch; The Conference Board; U.S. Geological Survey

Energy Industry Stock Prices—
Electrics, Diversifieds Continue to Languish

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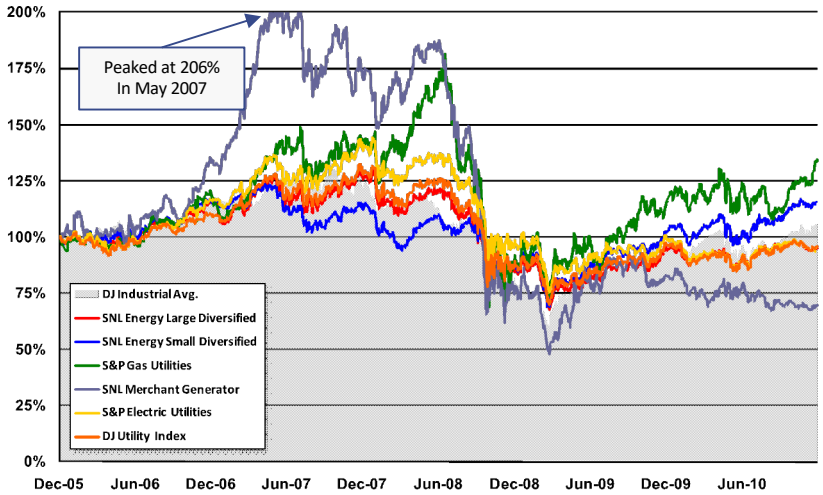
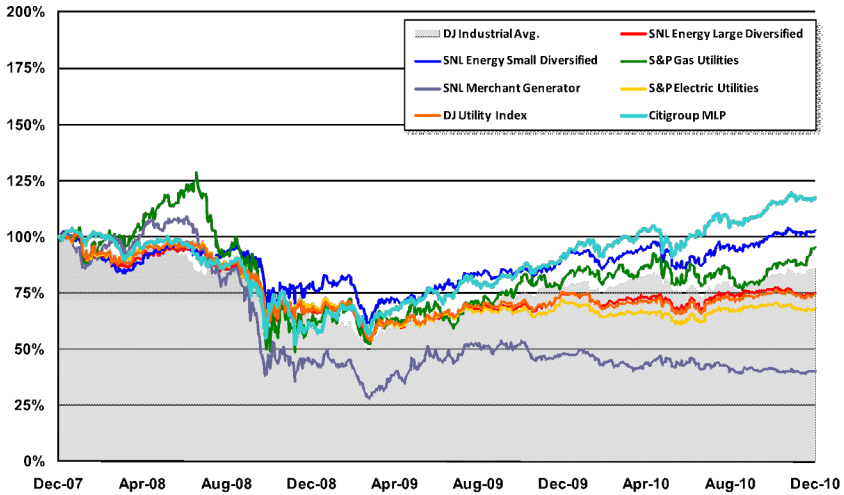
Diversified and Electric Utilities Tracking The Dow Since 2005

5-Year Sector Performance
Normalized Daily Index Values (Dec. 2005–Dec. 2010)



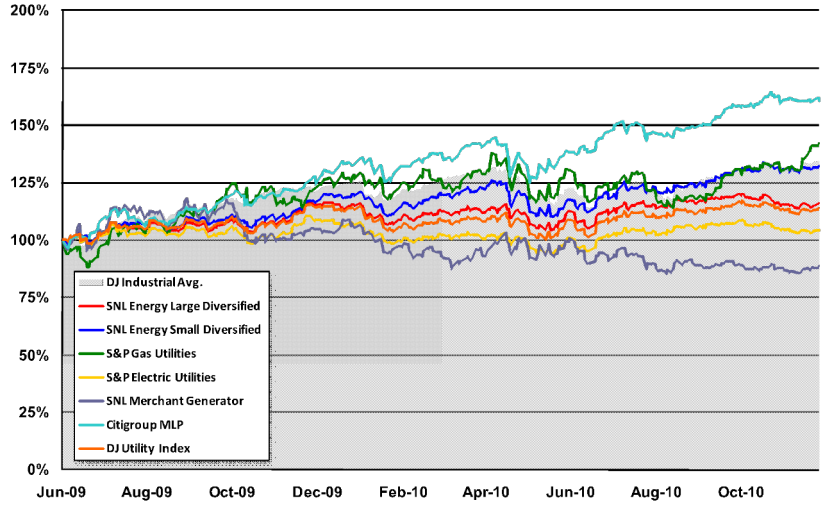
Small Diversified, Gas Companies Ahead of the Dow Since Crash

3-Year Sector Performance
Normalized Daily Index Values (Dec. 2007–Dec. 2010)



Gas Upstream and LDCs Continue to Outpace DJIA, Electrics Trail

18-Month Sector Performance
Normalized Daily Index Values (Jun. 2009–Dec. 2010)



Ending Index Value (Start of Period = 100%)	Since Mid-2009	Since End-2007	Since End-2005
SNL Energy Large Diversified	116%	75%	95%
SNL Energy Small Diversified	132%	103%	115%
S&P Gas Utilities	142%	95%	134%
S&P Electric Utilities	105%	68%	95%
SNL Merchant Generator	88%	40%	70%
Citigroup MLP	161%	117%	*
DJ Industrial Avg.	134%	86%	105%
DJ Utility Index	114%	74%	96%

Despite low natural gas prices, gas LDC and gas MLP stocks have done well. Moreover, electric and diversified utility stock prices continue to lag the Dow, despite improving economic numbers.

Note: All index values are 100% at beginning of relevant period. * means not available.
Sources: SNL Financial; ScottMadden analysis

Trends in Dividends, Earnings, and Valuations Among Selected Energy Sectors

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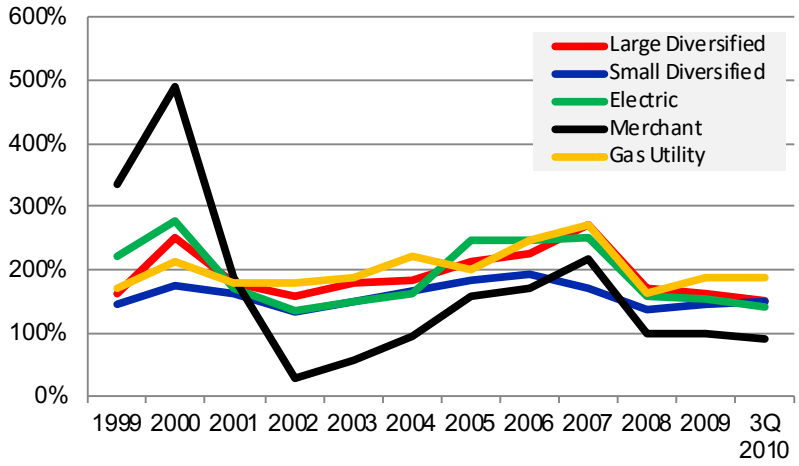
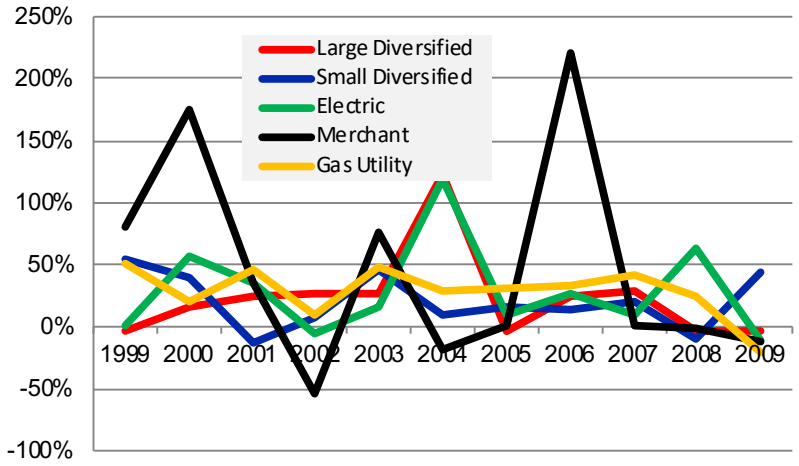
Price-to-Book Valuations Equilibrating Post-Recession

Year-End* Price-to-Book Value (Capitalization-Weighted) (%)



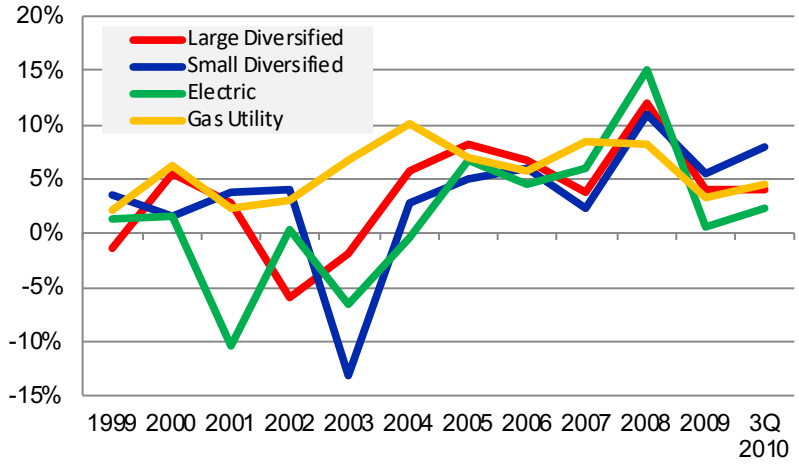
Small Diversifieds Bucking Earnings Growth Decline

Year-over-Year Net Income Growth Rate (Capitalization-Weighted) (%)



Dividend Growth Down but Still Positive

Year-over-Year* Dividend Growth (Capitalization-Weighted) (%)



- Utility valuations, as measured by multiples of book value, are down from the mid-2000s
  - A key question is whether these valuations are a return to normal or some inflection point that signals a bottom or buying opportunity
- Dividend growth declined in response to the "Great Recession"
  - Another driver is the desire to retain funds for the next wave of capital investment
- As one might expect, net income growth has trended downward
  - While slightly negative for most sectors in 2009, it was not as negative as many had feared
  - Early returns for 2010 show improved sales, especially among industrial classes
  - Small diversified utilities, however, seem to have been able to sustain positive earnings growth during the downturn

Notes: *3Q 2010 is for quarter end. Sectors are derived by SNL Financial: SNL Large Diversified (electric & gas utilities > $4 billion capitalization); SNL Small Diversified (< $4 billion); SNL Electric (electric only); SNL Merchant; and gas utility components of the SNL Energy index.

Sources: SNL Financial; KeyBanc Capital Markets; ScottMadden analysis

Mergers and Acquisitions—Speeding Up?

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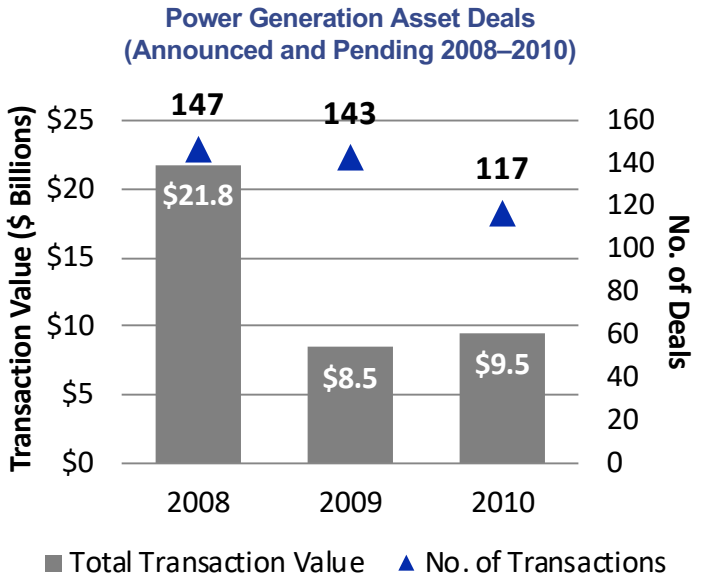
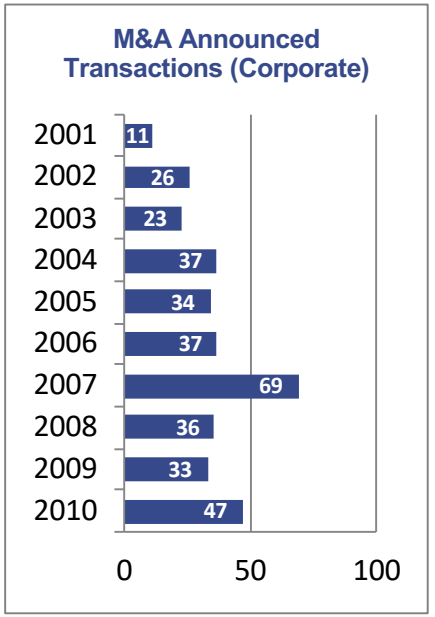
- The first half of 2010 saw continued merger activity with large transactions like PPL/E.ON, FirstEnergy/Allegheny, and Exxon/XTO. The second half continued this trend, with both asset and corporate acquisition activity continuing
- Some large transactions were announced at valuations that, for the most part, represented very modest premiums. This could reduce the need for huge synergies and perhaps lessen the risk of regulatory "claw back"
- Deal drivers were often related to scale:
  - Increase balance sheet size to support infrastructure investment (NU/NSTAR, for example, expect $6 billion in combined spending over the next several years)
  - Acquire assets or reserves in pursuit of growth (renewables, shale gas) or while valuations are depressed (merchant generation)
  - Expand base across which to spread fixed and corporate costs
- The weak economy requires savings without layoffs and could pressure public service commissions
  - Despite synergy potential, many acquirers are relying on attrition, not politically unpalatable layoffs
  - With ratepayers strapped for cash, regulators may require compelling savings passed along in rates, even absent large synergies

Asset Deals Coming Back Slowly: Fewer but Larger



Major Corporate Merger & Acquisition Announcements—Energy Companies

Companies	Deal Value	Share Price Premium	Announced	Sector	Size	Deal Value/ Book Value
Exelon Corp./ John Deere Renewables	$0.9B	NA	Aug. 2010	Renewable generation	1.5 GW in various development stages	NA
Northeast Utilities/ NSTAR	$4.2B (plus $3.4B in debt)	~1.9%	Oct. 2010	Electric utilities	3.5 million customers combined	NM
Chevron Corp./ Atlas Energy	$3.2B (plus $1.1B in debt)	37%	Nov. 2010	Upstream gas	9 TCF (incl. shale gas reserves)	2.2x
AGL Resources/ Nicor, Inc.	$2.4B (plus $0.7B in debt)	13%	Dec. 2010	Gas utilities	4.5 million customers combined	2.22X
Duke Energy/ Progress Energy	$13.6B (plus $12.1B in debt)	3.9%	Jan. 2011	Electric utilities	7 million customers combined	1.36x



Sources: SNL Financial; *The Wall Street Journal*; Bloomberg.com; company websites; ScottMadden analysis

Behind-the-Meter Products and Services: New Opportunity or Dot-Com Redux?

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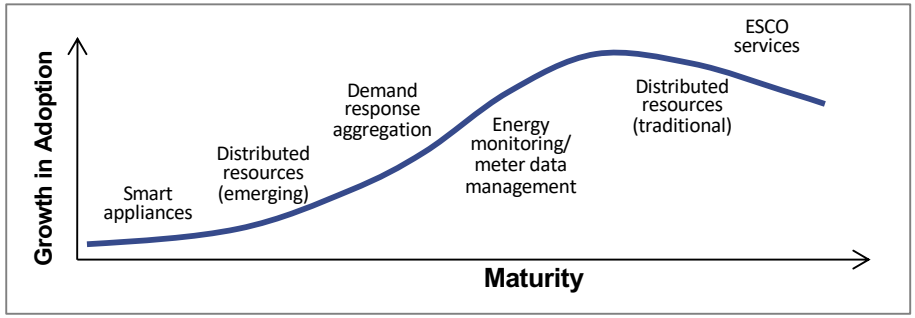
Relative Technology Maturity of Behind-the-Meter Products



Companies, in our sector and outside it, are trying to determine whether the smart grid will create a new era of business opportunity for behind-the-meter (BTM) products and services. Some questions they have:

- When will smart grid be capable of creating BTM opportunities?
- What is different now from prior retail "waves" in energy?
- How much integration is needed across value chain stages?
- How will the revenue and profits of this BTM "renaissance" be divided among segments and players? What operating and business models will emerge?
- How will customers respond? Which segments can, or will, participate?
- What are the scale and scope requirements to profitably offer BTM products?

Segment	Description	Example Players		Some Drivers/Issues
Demand response aggregation	Intermediators between customers and utilities/regional ISOs to pool demand response capabilities and provide peak load management and curtailment services, capacity bidding, and other services to reduce firm energy costs	❑ EnerNOC ❑ cPower ❑ Comverge		❑ Energy market expansion, restructuring; ISO roles ❑ Transparent price signals; supportive rate structures ❑ Public policy
Distributed resources (incl. renewables)	Distributed generation and storage for primary and stand-by power, heating and cooling applications, and grid ancillary services/renewables support	❑ Capstone Turbine ❑ Caterpillar ❑ Siemens	❑ GE Energy ❑ FuelCell Energy ❑ SunEdison	❑ Installed cost (improving) ❑ Resistance to net metering buybacks and FIT structures ❑ Grid-parity costs (esp. renewables)
Energy monitoring and management/ meter data management	Software, hardware, analytics, and customer interfaces that provide signals, information on real-time consumption	❑ OPower ❑ GridPoint ❑ Smart Synch ❑ Google ❑ EnerNOC	❑ eMeter ❑ Comverge ❑ Tendril ❑ Itron	❑ Improved technology ❑ Clear interoperability standards ❑ Privacy concerns ❑ "Performance contractor" stigma; customer investment required (also applies to ESCOs below)
ESCO services	Energy audits and consulting; energy equipment and installation, including energy efficiency retrofits, controls, HVAC, and building automation	❑ Utility affiliates ❑ Global equipment providers	❑ National ESCOs ❑ Local HVAC, electric cos.	❑ Subsidies and financing ❑ Agency issues ❑ Pricing of efficiency ❑ Payback time, return
Smart appliances/ hardware (incl. facility/ premise area networking)	Facility appliances and devices with modernized electricity usage systems that monitor, protect, and automatically adjust operations to the needs of its owner, including in response to price, utility signals, and emergency power situations	❑ Whirlpool ❑ Honeywell ❑ Carrier/ Ice Energy ❑ Microsoft	❑ Johnson Controls ❑ General Electric	❑ Clear interoperability standards ❑ Technology maturity/lifecycles ❑ Customer and equipment service ❑ "New normal" frugality ❑ Transparent price signals; supportive rate structures

Sources: Company websites; investment analyst reports; industry news; Cleantech Group, 2010 U.S. Smart Grid Vendor Ecosystem (Sept. 2010); DOE Berkeley National Laboratory; ScottMadden analysis

Residential Utility Customer Satisfaction: A Mixed Bag

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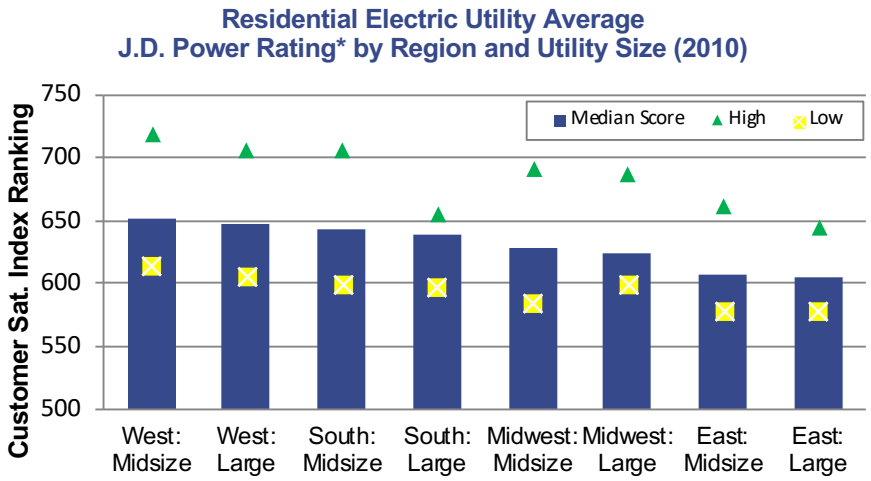
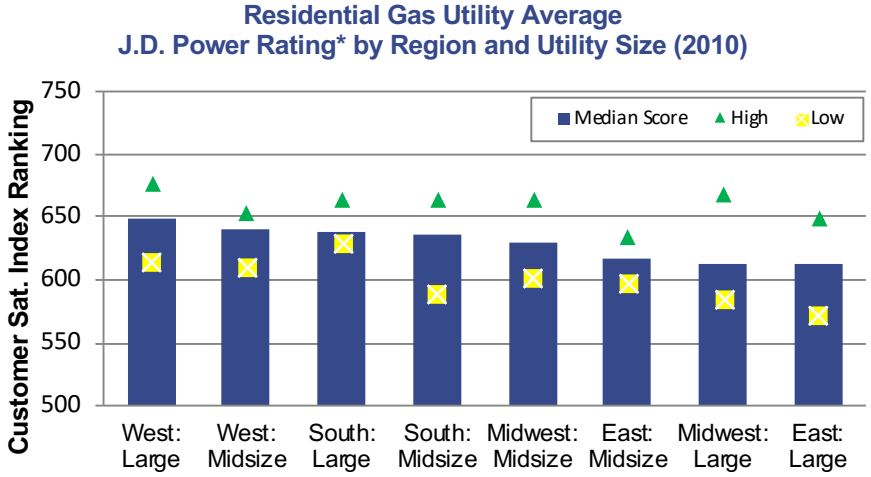
West and South Lead Residential Electric Utility Satisfaction



Gas Utility Satisfaction Has a Narrower Range Than for Electrics



Customer Communication Helps Electrics

- ❑ According to J.D. Power, satisfaction levels have increased year-over-year as customer bills have decreased and reliability has improved
- ❑ J.D. Power also found that managing customer expectations around outages and restoration mitigates declines in or even improves satisfaction
- ❑ To improve satisfaction, a mix of proactive and event communiqués is required. For example:
  - More scheduled outage notifications with the rising number and frequency of grid upgrade projects
  - Announcements of reliability and operational response investments and their results (benefits)
  - More frequent status updates, even with limited information, during storm outages (e.g., radio or mobile devices—texting, Facebook, Twitter, etc.)
- ❑ Helping customers with their overdue bills, as one might expect, substantially improves customer satisfaction; utility education and energy efficiency/management programs are additional, helpful high bill resolution options
- ❑ Customer awareness of their local utility's implementation of smart grid and smart meter technology remains low

Satisfaction Improves for Gas Utilities

- ❑ Lower bills, more frequent communication, and improved perceptions of corporate citizenship have led to higher satisfaction levels
- ❑ Gas customers are also more familiar with energy savings programs and want more communication on how to reduce bills and conserve energy
- ❑ J.D. Power opines that emphasizing the value of service provided by gas utilities lifts overall satisfaction

Notes: *Scores are out of a possible 1,000 points

Source: J.D. Power and Associates, 2010 Gas Utility Residential Customer Satisfaction Survey (Sept. 22, 2010) and 2010 Electric Utility Residential Customer Satisfaction Survey (July 14, 2010); ScottMadden analysis

Natural Gas:
A New Normal or About to Make the Turn?

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"Drill, Baby, Drill": Production Continues to Grow

- Onshore gas production continues to grow despite low gas prices and regulatory setbacks in Marcellus
- Rig count is expected by some to level off and ultimately decline to a tipping point of about 800 rigs (U.S.) to stabilize gas prices
- However, horizontal gas drilling operations are more efficient and productive, yielding more gas per rig, so supply should be plentiful through 2012

For Producers, First the Bad News, Then...?

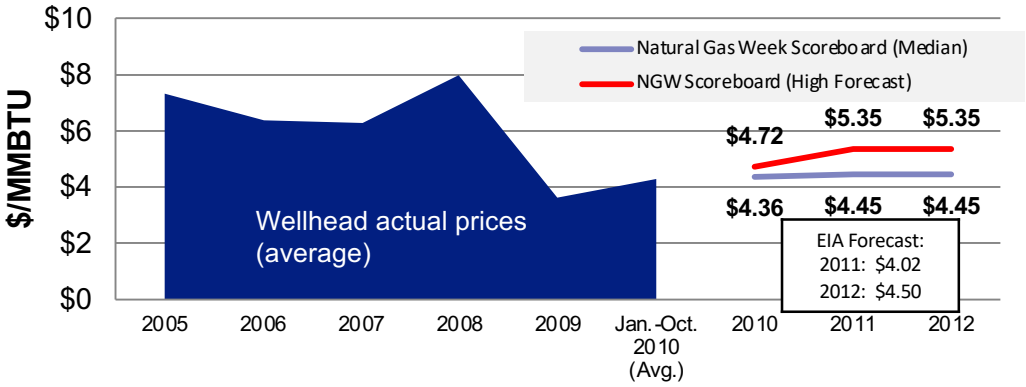
- Enhanced revenues from rising natural gas liquids prices have lowered the breakeven dry gas production cost in some plays
- Some producers looking to migrate from dry gas-only plays like Haynesville and Barnett to places like Eagle Ford and Marcellus
- Some analysts project that gas prices will firm after 2012, buoyed by:
  - Coal power plant retirements
  - Carbon constraints
  - Step-down in drilling activity as wells mature
  - Hedges (i.e., forward sales) roll off
  - Possible export (LNG) demand

Demand and New Large Players

- Demand remains suppressed, but is expected to begin to firm with continued economic growth
- Oil and gas majors are entering the market, acquiring shale players who need a larger balance sheet and gaining experience to apply in shale fields inside and outside North America

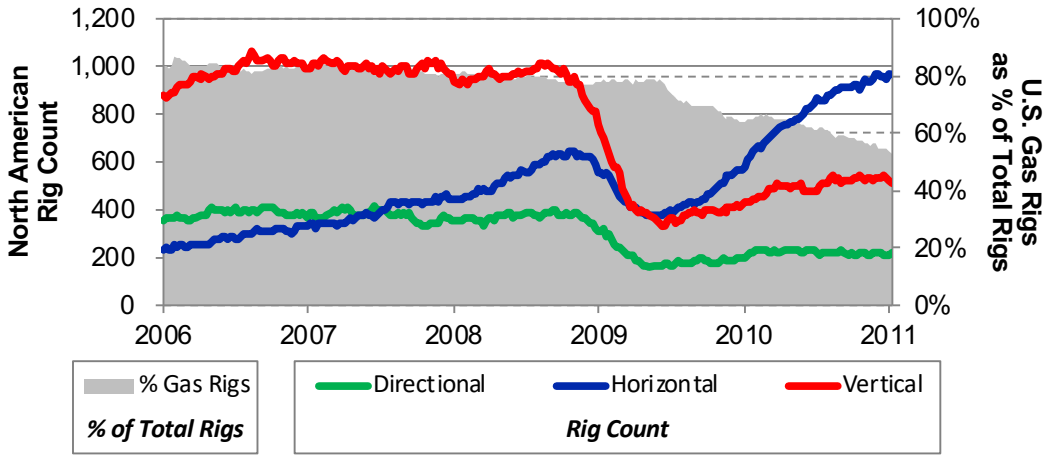
Gas Prices Projected to Remain in the Mid-$4s to Mid-$5s Through 2013

Actual Wellhead Gas Prices vs. Henry Hub Price Projections by Selected Analysts (in $/MMBTU)



Horizontal Rigs in January 2011 at 967, Up from Under 400 in Spring 2009

North American Rig Count by Type vs. U.S. Gas Rigs as % of Total Rigs



Sources: Energy Intelligence *Natural Gas Week*; Energy Information Administration; SNL Financial; Baker Hughes; Deutsche Bank; American Gas Association; industry publications; ScottMadden analysis

Two Views of the Impact of EPA Regulations on Power System Reliability in the U.S.

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Much attention has been paid to the potential retirement of power generation in the U.S. as a result of various pending EPA regulations covering air, water, and ash. Two recent studies looked at possible consequences for reliability.

A Comparison of Two Analyses of EPA Regulation

	NERC (Oct. 2010)	Charles River Associates (Dec. 2010)
Key Points of Alignment	❑ A significant portion of coal-fired generation is currently slated for retirement, even without tighter environmental regulations ❑ Certain reliability sub-regions will be affected much more than others ❑ The impact of greenhouse gas regulation is not included ❑ Assessments did not project expected power cost, only retrofit vs. retire economics	
Key Differences in Assumptions and Approach	❑ Looks at <u>all</u> EPA regulations – MACT, coal combustion residuals, cooling water (thermal) constraints, and Clean Air Transport Rule (CATR) ❑ Analysis was national in scope	❑ Looks <u>only</u> at MACT and CATR ❑ Limited its analysis to the Eastern Interconnection
Conclusions	❑ Regulations impact 33 GW to 70 GW (retire or retrofit) ❑ MACT alone could trigger retirement of 2 GW to 15 GW ❑ Cooling water intake has the greatest impact on reserve margins, as it impacts nuclear and could force derates ❑ By 2015, combined EPA regulations could cause 32+ GWs in retirements and derates (over 77 GWs under a strict case with no compliance extensions) ❑ Under a moderate case and assuming only deliverable (i.e., existing plus planned) capacity: — ERCOT, ReliabilityFirst, and SERC-Delta, are most affected by retirements (in total GWs) — ERCOT, the Midwest, New England, and many of the Southeastern subregions fall below target reserve margins	❑ Under an aggressive MACT policy, CRA projects 35 GW of coal capacity in the Eastern Interconnection to be retired by 2015 — Retirements are small compared with historical net capacity additions — Average age of those units is 55 years ❑ With retirements, 2015 reserve margins fall below required margins in some sub-regions, but are adequate on a regional level — Permitted projects development can reduce the shortfall — New gas-fired capacity, above that currently permitted, can "easily address" the shortfall (about 11.5 GWs) ❑ Other methods can be used to manage shortfall, including: — Load management — Coal-to-gas conversion

Leadership in the Republican-controlled 112th Congress has announced strategies (or intent) to slow or moderate EPA regulation via:

- <u>Appropriations</u>: Limiting EPA funding on selected initiatives
- <u>Oversight</u>: Conducting hearings on EPA activities before Energy & Environment, other Congressional committees
- <u>Legislation</u>: Mandating delay on some EPA actions (esp. greenhouse gas regulation)

Key issues and uncertainties:

- How long cheap gas will last
- Impact of better than expected electric demand
- Availability and cost of gas pipeline extensions, expansions to support new or repowered generation
- Required cost and timing of transmission enhancements
- Realistic timing of new capacity resources "in the wings"
- Cost of power with shift in resource mix

Sources: NERC, <u>2010 Special Reliability Scenario Assessment: Resource Adequacy Impacts of Potential U.S. Environmental Regulations</u> (Oct. 2010); Charles River Associates, <u>A Reliability Assessment of EPA's Proposed Transport Rule and Forthcoming Utility MACT</u> (Dec. 16, 2010)

Smart Grid 2.0: Integrating Smart Grid Into Utility System-Wide Business Planning

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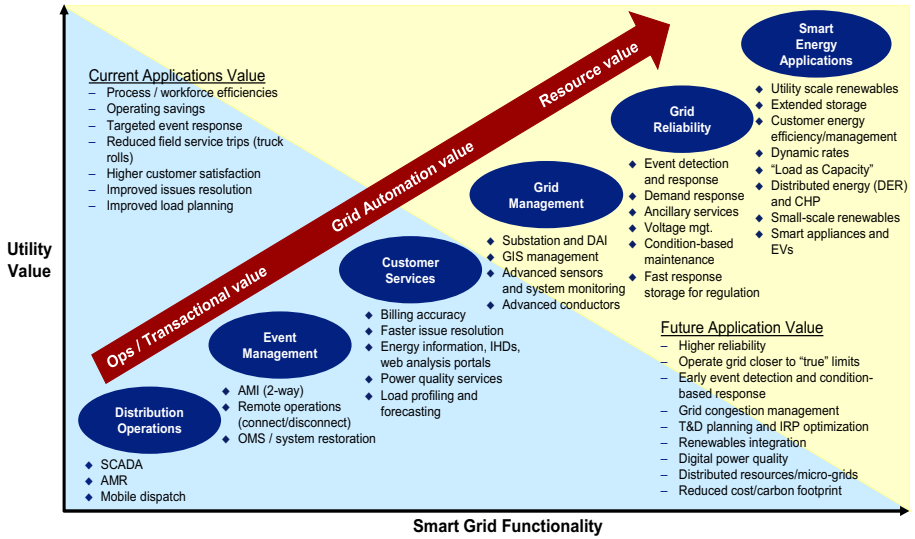
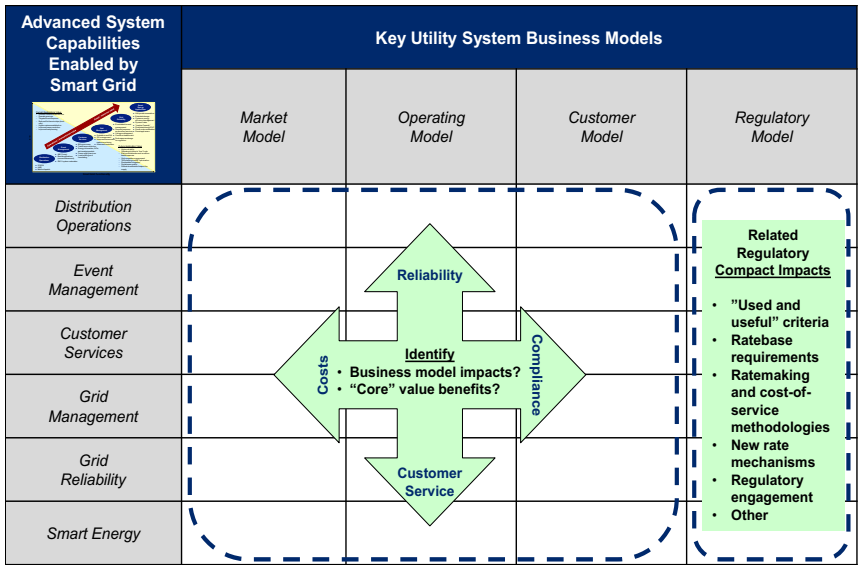
Advanced Energy Capabilities Enabled by Smart Grid



- Industry leaders believe smart grid and the advanced energy capabilities it enables can significantly benefit core utility value—reliability, efficiency/cost savings, compliance, and customer service
- Many utilities have developed business cases valuing individual smart grid-enabled technologies (e.g., AMI, demand response, etc.)
- To date, this narrow scope has limited utility planning, acceptance, and investment in smart grid capability
- Focus has been on engineering "proof of concept" pilots. However, pilots do not clearly demonstrate the value of larger (full) system deployments to the market
- Utilities are now seeking a broader, comprehensive value framework and planning approach to cohesively guide this multi-year, multi-billion dollar, industry-wide system capability investment, both on the utility and customer sides of the meter

Smart Enterprise "Value" Framework and Planning Approach



Aligning Smart Grid Functionality With System Business Needs in the Context of a Utility's Market and Operations

Key Questions

- ☑ What are key market, operating, and customer value drivers or "sign posts" to monitor?
- ☑ How do drivers impact a utility's key business models and metrics (e.g., market, operating, customer, regulatory)?
- ☑ What are achievable opportunities to "operationalize" smart grid's value today and in the future?
- ☑ Are clear, long-term system core values demonstrated to ratepayers, regulators, and stakeholders?
- ☑ What are our business plans—market, operating, customer, and regulatory—and supporting smart grid strategy/infrastructure "roadmap" for moving ahead, managing related enterprise risk, and gaining regulatory, community, and stakeholder support?

Source: ScottMadden analysis

NERC Reliability Standards and Compliance Violations: A Roundup

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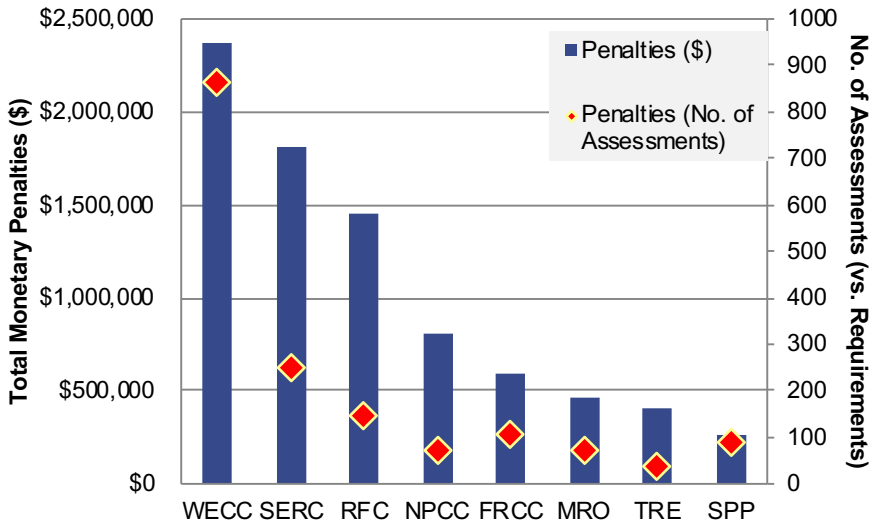
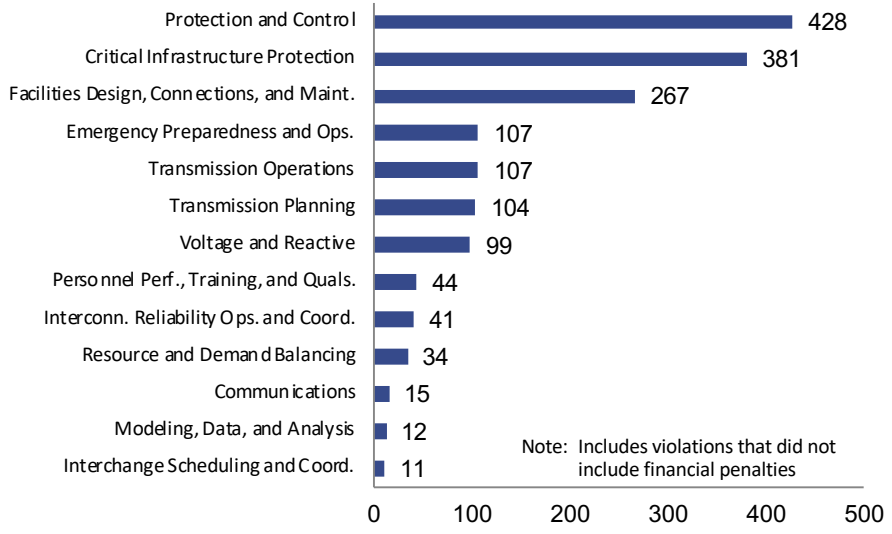
The Western U.S. Leads Other Regions in Compliance Penalties in Part Due to the Number of Registered Entities

Cumulative NERC Violations and Monetary Penalties* by NERC Region (June 2008–December 2010)



Critical Infrastructure Protection Has Been Oft-Cited

Cumulative NERC Compliance Penalties (No. of Assessments)* by Topic Area (June 2008–December 2010)



- NERC and FERC have been trying to address friction as FERC seeks more timely standards development and aggressive enforcement (i.e., more significant penalties) of key focus areas like critical infrastructure protection
- FERC, in reviewing NERC's self-assessment of performance, had specific concerns about NERC's reliability standards development process, specifically improving certain standards and their pace of development
- At FERC's insistence, NERC has now proposed a revamp of the standards development process
- Only time will tell how these changes will affect registered entities and the regional reliability organizations
- In addition to evolving standards, the industry is contending with alerts from NERC that may require swift and costly modifications to equipment and operating processes

Notes: *Excludes FP&L's $25 million settlement in October 2009. NERC violation count based upon each requirement violation.

Sources: NERC (as of Jan. 15, 2011); SNL Financial; ScottMadden analysis

Electricity Cost Trends, Fuel Mix, and Regulatory and Market Models

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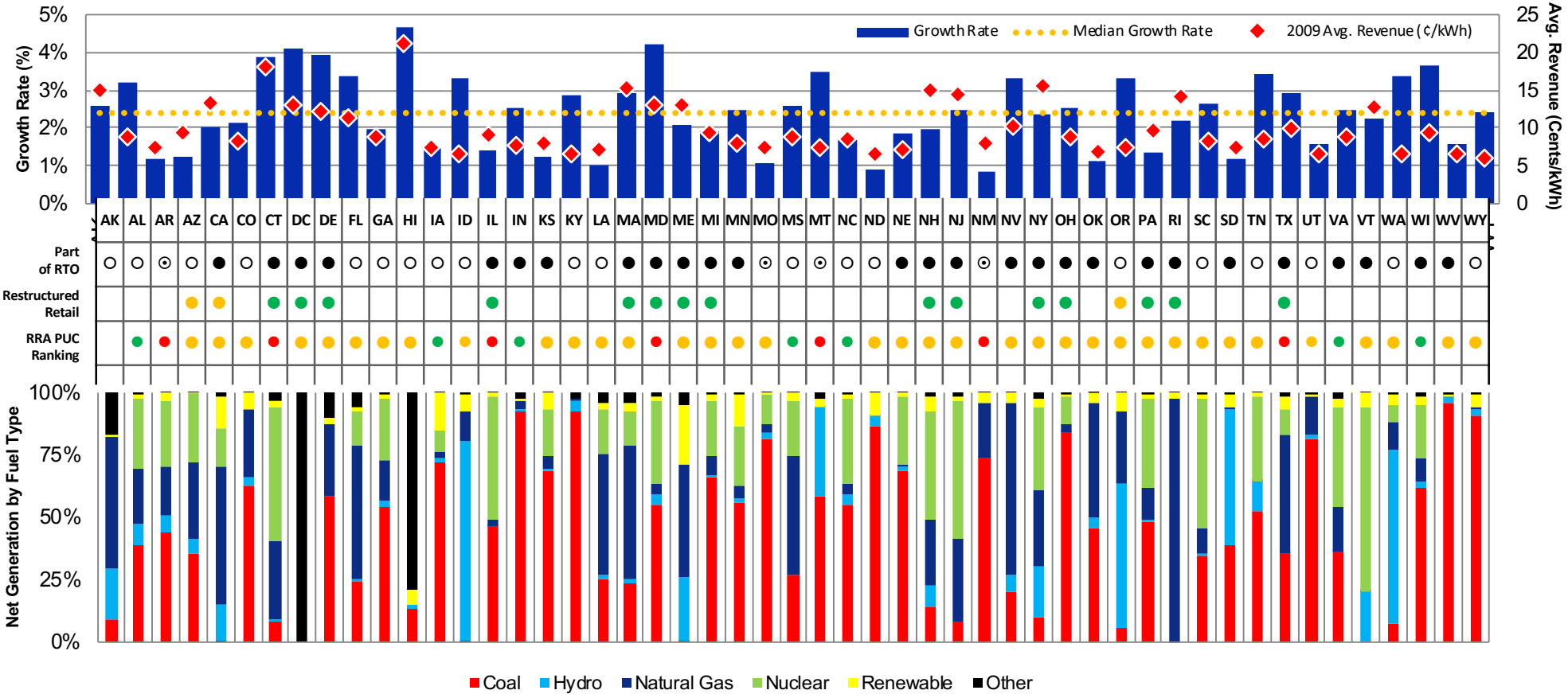
Compound Annual Growth Rate in Total Retail Revenues per kWh (1994–2009) and 2009 Average Revenues per kWh



Legend
Part of RTO: Full or most ● | Part ⊙ | None or insubstantial ○
Restructured Retail: Full choice ● | Partial choice ●
RRA PUC Ranking: Above average (constructive) ● | Average ● | Below Average ●

Sources: Energy Information Administration; ISO/RTO Council; Compete Coalition; SNL Financial/Regulatory Research Associates; Distributed Energy Financial Group, Annual Baseline Assessment of Choice in Canada and the United States: An Assessment of Restructured Electricity Markets (Dec. 2010); ScottMadden analysis

- ❑ The link between growth in revenues per kWh of electricity and regulatory model is uncertain at best
- ❑ Fuel mix has a bearing, especially where coal (historically cheaper) or gas (historically more expensive) is a significant part of the mix
- ❑ Interestingly, while revenues per kWh (rates) predominantly coal-fired jurisdictions remain relatively low, for many their growth has been above median
- ❑ Some lower cost jurisdictions—Alabama, Tennessee, Oregon, and Washington—have increased the most over the past 15 years

Energy Costs and "Share of Wallet": A Pushback Coming?

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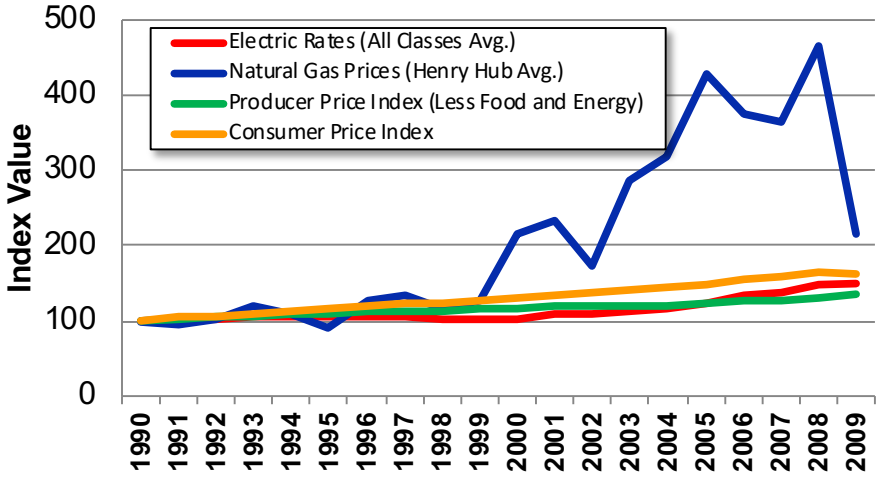
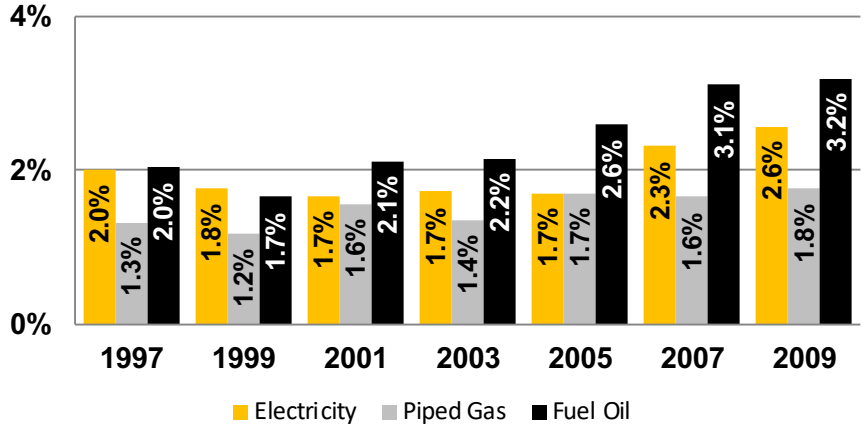
The Twenty-Year Trend for Household Energy Is in Keeping With Key Price Indexes

Average Annual Electricity Rates vs. Other Cost Measures (1990–2009) (Index: 1990=100)



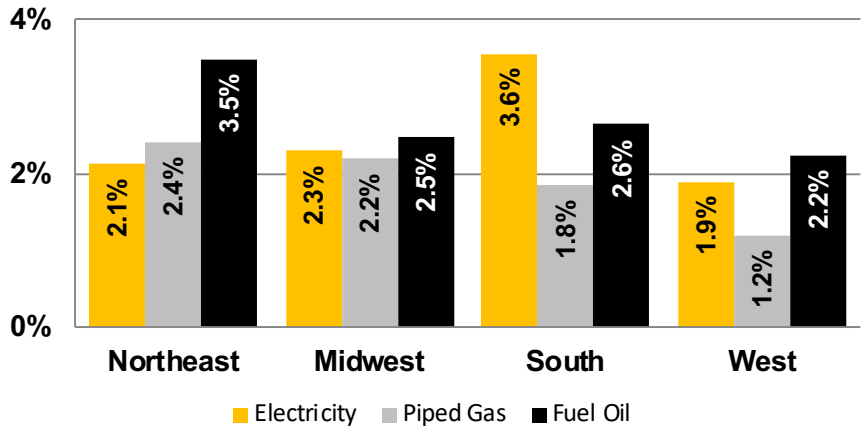
Energy Costs as a Percentage of Income Are Rising Now, a Trend Exacerbated by a Decline in Household Income in 2009

Share of Wallet: Median Energy Costs as a % of Median Household Income (Nominal $)*



Regional Variations for Energy Costs In Comparison with Median Income Levels Can Be Significant

Share of Wallet: 2009 Median Energy Costs as a % of Median Household Income (Nominal $)*



Energy Costs Take a Larger Bite Out of Households

- While household energy costs have kept pace with key inflation indices over the last two decades, "share of wallet" is increasing now
  - Piped natural gas expenses, as a percent of income, have increased since the late 1990s
  - Electricity costs, which fell in the early 2000s, have increased rapidly since mid-decade, rising from 1.7% of income to 2.6% in four years
- There are differences by region in household energy "share of wallet"
- A tipping point is possible as stagnant incomes, coupled with increasing costs, squeeze households
- This could mean lower consumption, fewer rate case filings and less favorable ratemaking mechanisms

Notes: *Energy costs are for those households consuming this fuel type; median income is for all households
Sources: U.S. Census Bureau, Annual Household Survey; U.S. Bureau of Labor Statistics; Energy Information Administration; ScottMadden analysis

Renewable Portfolio Standards: Comparing Resources with Goals

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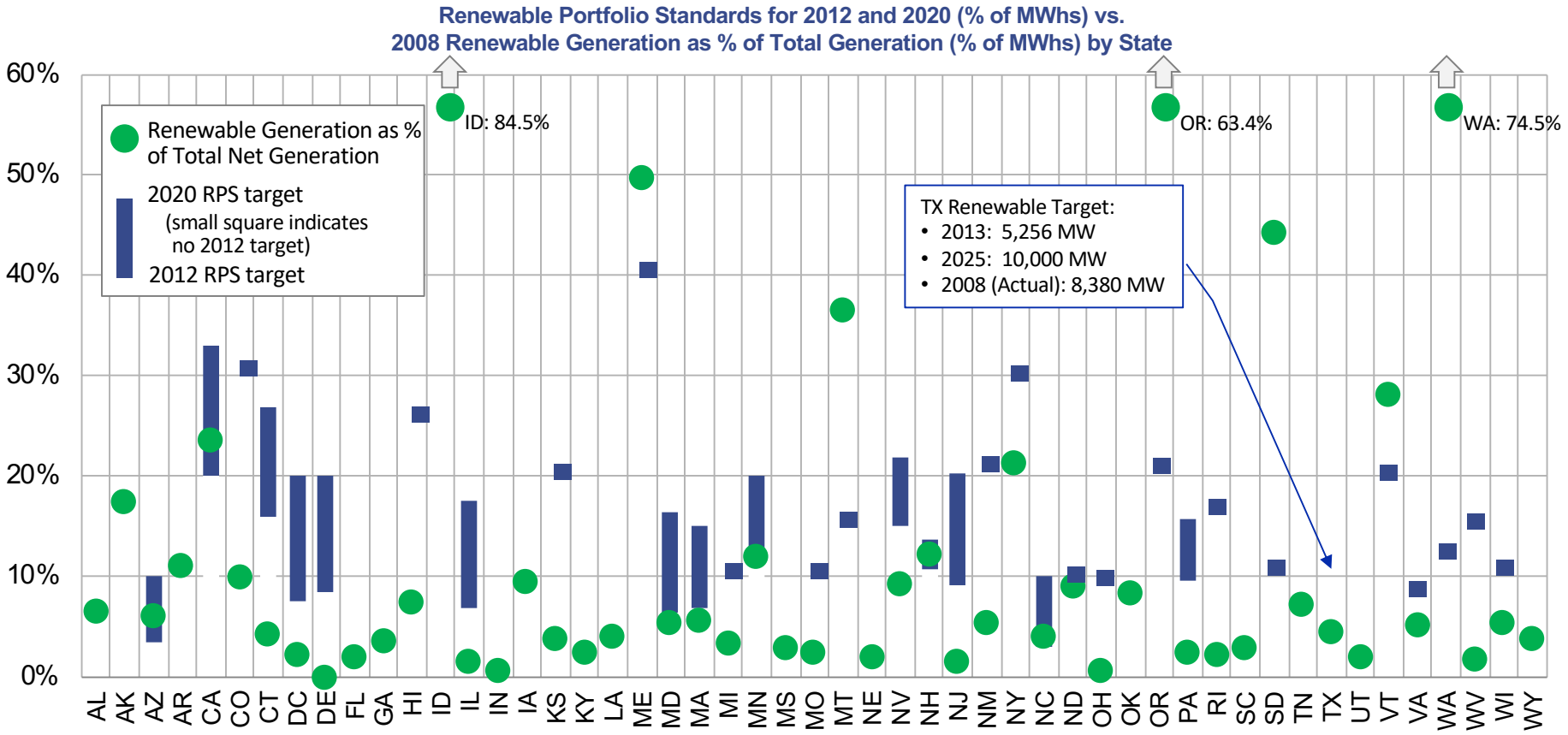

- ❑ As the first target dates under various state renewable portfolio standards approach, states are positioned differently
- ❑ States with a large portion of their energy mix from large hydro (e.g., the Pacific Northwest, New York, Maine, Vermont) are well positioned. However, dependence upon these resources make hydrologic conditions a crucial variable in whether the standards can be consistently met
- ❑ Some states—Delaware, DC, Illinois, and Pennsylvania, for example—have a significant gap to overcome to achieve their 2012 renewable generation targets
- ❑ Others with 2020 time frame targets have a similar gap but some time to put resources into place

Sources: U.S. Energy Information Administration (EIA), State Renewable Electricity Profiles 2008 (Aug. 2010), at http://www.eia.gov/cneaf/solar.renewables/page/state_profiles/r_profiles_sum.html; EIA, State Electricity Profiles 2008 (Mar. 2010), accessed at http://www.eia.doe.gov/cneaf/electricity/st_profiles/e_profiles_sum.html; Database of State Incentives for Renewable Energy

Energy and Environmental Policy: A Grand Bargain or Guerilla War on the Piece Parts?

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	Anticipated White House/ Agency Approach 	New Congressional Environment 	Possible Wild Cards 	The Bottom Line
EPA Conventional Emissions Regulations	❑ Proposed boiler MACT rules in Q1 2011, finalize by Mar. 2012 ❑ Final Transport rule in 2011 ❑ Some delays requested (e.g., biomass MACT)	❑ House oversight hearings likely ❑ Potential limitation on EPA spending	❑ Results of and reactions to "listening" meetings ❑ Obama regulatory review ❑ Judicial action in response to EPA-sought delays and environmental organization challenges thereto	❑ Compliance may be deferred out of concerns on impact on U.S. economy ❑ But environmental intervenors may force continued EPA action ❑ No reversal of standards in next two years
Clean Energy	❑ "Clean" energy standard expanded to include some types of non-renewable generation ❑ Continued investment in R&D ❑ Government-driven green energy procurement	❑ Some bipartisan support in Senate for clean energy standard (with nuclear) ❑ No strong advocate in House	❑ Deficit concerns on additional funding	❑ Some R&D funding ❑ Clean or renewable energy standard less likely given opposition to nuclear by the environmental lobby
Regulation Of Greenhouse Gas Emissions	❑ No cap-and-trade legislation pushed ❑ EPA pushing tighter standards on new sources and implementation plans, BACT on existing generators	❑ No cap-and-trade legislation ❑ House oversight hearings, potential limitation on EPA spending on GHG regulation	❑ Carbon tax may be viable with deficit hawks, but industry will oppose increased customer cost ❑ Supreme Court decision on GHG emissions tort vs. EPA regulatory pre-emption ❑ Outcome of state lawsuits challenging GHG BACT	❑ No legislative approach, but EPA pushes on (inventory baseline) ❑ Possible House inquiry into climate science ❑ U.N. non-binding targets
Nuclear Development	❑ Increased authority for guarantees for new plants	❑ Call to reform guarantee program, reduce role of OMB	❑ Deficit concerns: increase may not be budget-neutral	❑ A challenge to get additional funding, guarantees

Sources: Van Ness Feldman; K&L Gates; Alston & Bird; SNL Financial; industry news; Senate, House committee websites; ScottMadden analysis

Solar Development Remains on a Roll, But It Still Requires Subsidies

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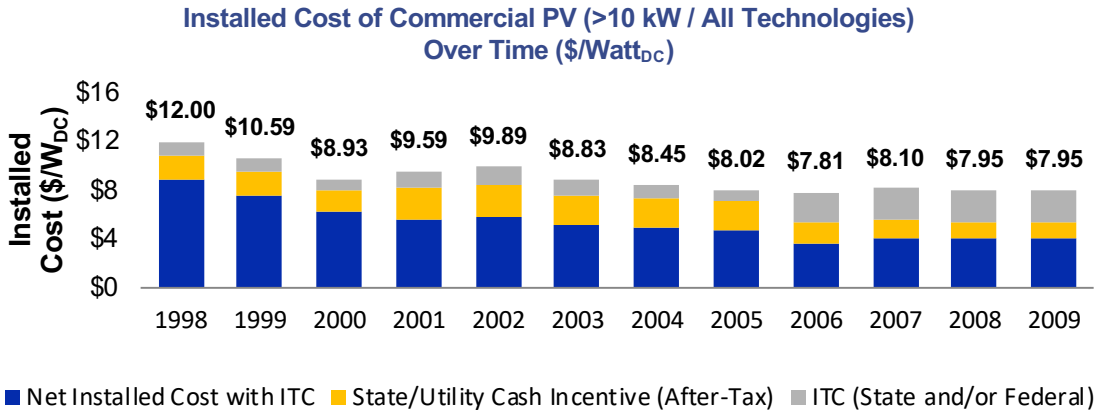
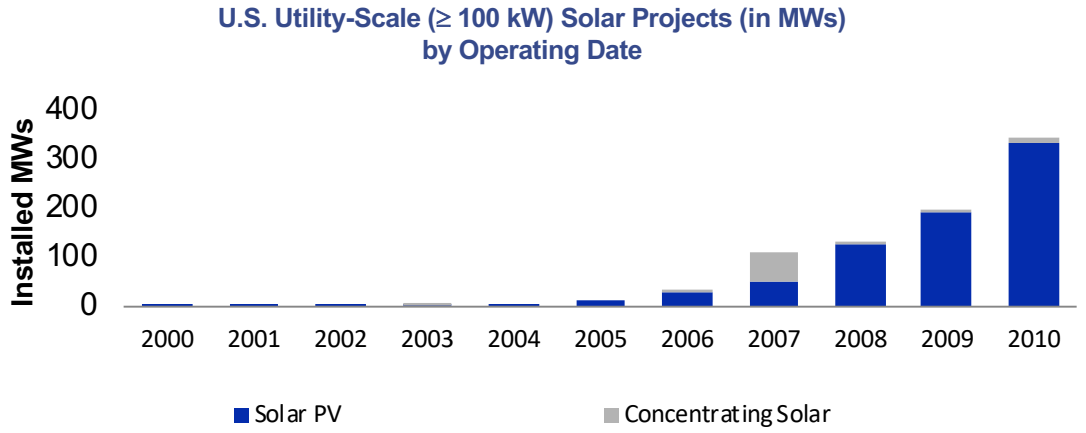
- Solar development continued to grow in 2010, well above the 2009 pace
  - Solar PV installations totaled 525 MWs through 3rd Quarter 2010, up 1/5 vs. 2009
  - One projection has U.S. solar capacity reaching 44 GWs by 2020, requiring $100 billion in investment
- Solar costs have been decreasing with scale economies and expanded manufacturing capacity
  - Global PV panel capacity is projected to grow to 30 GWs by 2013 from 10.1 GWs in 2009
  - Producers are mobilizing—e.g., GE is prioritizing solar business growth
  - European manufacturers are expected to look abroad as European subsidies (especially feed-in tariffs) are reduced amidst fiscal austerity
- The U.S. market is still dependent upon favorable state policy and development is concentrated in a handful of states
  - The top five states—CA, FL, NJ, AZ, and PA—account for 76% of large (>100 kW) solar PV installations since 2000
  - Policy support is still necessary: CA, for example, allows up to 5% aggregate net metering and providing $3 billion for "Go Solar" subsidies
- Asian growth will fuel increased activity and pull equipment abroad: China is targeting 20 GWs of installed solar by 2020; India's goal is 1 GW by 2013

Incentives and Tax Credits Cut Net Installed Commercial PV Costs in Half



Solar PV Installations Helped by Grants and Reduced Equipment (Module) Cost



Sources: *Solar Industry* magazine; *Renew Grid* magazine; SNL Financial; *The New York Times; The Wall Street Journal*; Bloomberg New Energy Finance; Energy Acuity; G. Barbose, N. Darghouth & R. Wiser, Lawrence Berkeley National Laboratory, Tracking the Sun III: The Installed Cost of Photovoltaics in the U.S. from 1998-2009 (Dec. 2010); Greentech Media, U.S. Solar Energy Trade Assessment 2010 (Nov. 2010), prepared for Solar Energy Industries Association

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Energy industry landscape: sharpening contrasts and accelerating change

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