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Our year-end overview at the end of 2007 focused on the central strategic issue of reconciling our society's increasing need for energy with the urgent concern about the effects of carbon emissions. A year has passed, and the core issues remain the same. For good measure, what appeared to be tangential issues last year—such as balance sheet health and baseload capacity—have moved to center stage in light of the recent credit meltdown and the seismic political shift in Washington. These and other dramatic developments, like the change in long-term gas market fundamentals, may substantially alter the power supply and delivery industry. In fact, by the end of 2009, policy evolution may have initiated a tectonic shift in the landscape of the utility sector, changing it to a form largely unforeseen and unimaginable.

It may seem that there is no clear direction for the industry to move—that the choices are too complex and uncertain. We disagree. We believe the utilities industry faces a well-defined set of challenges, even if the paths to resolution are less clear. Although navigating through these challenges will not be easy, companies can define and pursue explicit and responsive strategies, including a number that are so necessary that executives can adopt them without fear of regret. However, while taking action is vital, being the first mover may not be. Uncertainty, and the spate of first-of-their-kind technologies, suggests that fast followers will be better positioned to effectively execute and more likely to be rewarded, as long as the industry as a whole is not trapped by strategic paralysis. In fact, the biggest challenge facing utilities may not be what to do, but how to do it—and how to accomplish it financially.

The financial constraints of the current liquidity crisis, in particular, are already shaping the agenda for utilities for the coming year. Restraining cost growth is becoming more critical if utilities are to address underfunded pension requirements and respond to implied regulatory price ceilings. Capital expenditure limits are also a natural response, but they may not be the best option when policy mandates are calling for more targeted investment. If companies retrench in their pursuit of strategic growth, they risk missing opportunities that may not be available later. In short, while leaders are focused on solidifying financial strength and flexibility right now, they must also consider how their companies will fare strategically and competitively in future years.

As we look ahead, we believe winners in the new energy era will be defined by how they respond—both today and during the next few years—to three distinctive long-term challenges, the contours of which are emerging today. The first relates to technology and the multitude of strategic paths that different technological choices offer. The second involves successfully managing the balance sheet, and the third challenge is to build the capabilities that allow

improvement in core performance. Finally, we see seven strategies that will help companies navigate these difficult times.

Technology Choice and the Supply-Demand Portfolio

Post-election, some form of carbon legislation appears to be a certainty. It is also certain that investments in new supply cannot be postponed indefinitely, despite a recessionary drop in demand growth. Industry-wide emissions reductions, consistent with a Warner-Lieberman framework, are technically feasible in the long term, though they are likely to come at a steep price. Companies must make difficult choices among a variety of supply-demand technologies: renewables, nuclear, advanced coal, energy efficiency, and storage. These options are increasingly converging at the economic margin, however, as long-term forecasts for gas prices decline. Thus, it becomes increasingly probable that CO_2 regulation will be phased in more slowly and be more closely tied to technology development than is implied under most pending legislation.

The complexity of technology choices, combined with unprecedented capital requirements and the inevitable regulatory distortions and benefit conflicts, creates a high level of risk for any market participant. Successfully navigating through these choices requires a clear view of the evolving market. We see a distinct set of trends that will likely define the power market in the next 10 to 15 years, yet will require attention during 2009 to address their implications.

- *Gas will be the primary transitional generation choice*. If the optimism surrounding increased potential for unconventional gas production proves justified, as we believe it will, U.S. gas prices should remain moderate. They should stay near current levels for the short to intermediate term, with ample supply at the margin, helping to insulate North America from global gas price risk. Consequently, gas is likely to be the primary and most economical carbon-compliant supply option—and a lower-risk bet for generation in the near to intermediate term.

- *New generating technologies will be economically marginal in a lower-cost gas environment but will be forced into the market anyway.* Lower-cost gas will put economic pressure on the users of renewables and advanced base technologies—such as nuclear and carbon capture and storage (CCS)—to reduce capital costs and more aggressively manage project development risk. The legislatively mandated entry of renewables, however, will mature these technologies while softening generators' pressure on natural gas prices.

- *The federalization of transmission is inevitable.* Transmission is pivotal in supporting wind-driven renewable portfolio standard (RPS) objectives and increasing wholesale market liquidity. Federal power corridors, increased certainty in siting and permitting, and strong return incentives will be policy essentials.

- *Utilities will increasingly employ remote energy parks for scale and greater transmission leverage.* The industry's needs—to build big, to simplify siting issues, to reduce operating costs, and to optimize intermittent generation—will favor remote co-location of both renewable and conventional power sources. Diverse technology power parks may become the foundation of leading-edge supply and transmission development.

- *Demand destruction will require redefinition of the regulatory compact.* Aggressive energy-efficiency and demand-response programs, coupled with long-term advances in distributed generation, will reduce grid demand and subsequently put downward pressure on earnings. Preserving the regulatory compact will require increased rate decoupling and a broadening of rate-of-return (ROR) regulation to capture increasingly distributed and lower-intensity capital assets, such as distributed solar and demand-side management (DSM) infrastructure.

- *The backbone of the smart grid is a guaranteed investment but will require a transformation in the industry's approach to customers.* The smart grid is an evolutionary technology in which increasing two-way end-user functionality can be added to an economically viable system based on advanced metering infrastructure (AMI) and distribution automation. But the true revolution in enabled DSM—which is enabled the industry's mobilization of its customer base—will be inhibited by the industry's lack of deep customer knowledge and sophisticated marketing capabilities.

- *Plug-in hybrid vehicles are a long-term wild card, but the momentum has rapidly shifted to faster deployment than anticipated.* Electric vehicles are of interest to the public and likely to get a long-term boost from the response to the auto industry crisis. A return to higher oil prices, the increasing focus on carbon emissions and national energy security in the developed world, and battery technology advancement could realistically drive significant penetration of electric vehicles in parts of the country. A steady migration of the U.S. auto fleet to battery power will require the industry to successfully tackle charging infrastructure and net metering issues. Ultimately, this shift will create carbon offsets and incremental cash flow to the industry and improve the financial viability of capital-intensive generation options, such as nuclear and advanced coal CCS.

The way you choose to define your path ahead today will have significant impact on your success tomorrow. Each trend is redefining the supply and demand sides of the power equation—or will do so eventually. In the long term, the market will be more technologically diverse, will exhibit increased end-user disaggregation from the grid (or selective and flexible opt-out options), and will require increased consumer connectivity. It also will be less energy-intensive, will cost more, and, without significant changes to the regulatory compact, will be much less attractive to shareholders.

Freedom of Movement: Balance Sheet and Regulatory Uncertainty

Whatever your outlook for the future, your near-term ability to place bets will be influenced by three major constraints that will restrict your freedom of action in the coming year—and may present even long-term threats to shareholder value.

The credit market—balance sheets and liquidity. Tight credit markets, the single-most top-of-mind issue at the end of 2008, are stressing balance sheets and limiting strategic flexibility. In an increasingly common sequence of events, equity currency is being destroyed as P/E ratios fall (leveling out at about 12), reducing companies' financial strength. This is followed, as balance sheets weaken, by increasing difficulty and expense in securing credit for project financing and general corporate debt. Finally, rating agencies impose more stringent credit requirements: more disclosure, greater reserves, and closer scrutiny of derivatives, hedges, and other interparty risk.

The current perspectives of the rating agencies are in line with the thrust of legislation: The European Union, for example, has already adopted a series of measures along the lines of Sarbanes-Oxley, requiring greater disclosure and limiting certain activities. This is particularly troublesome as the industry is on the cusp of a massive expansion in needed capital investment. Long-term winners will take immediate action to strengthen their balance sheets and improve liquidity. This will be necessary to maintain critical spending programs, preserve planned earnings contributions, and retain the flexibility to capitalize on potential once-in-a-lifetime opportunities to acquire assets at attractive prices.

Reinvigorated regulatory scrutiny. New regulatory mandates and spending demands—regarding carbon legislation, RPS, and energy efficiency—bring us to our second constraint: the tension between capital spending mandates and regulatory claw-back. Choices, and therefore outcomes, that put too much upward pressure on rates are likely to face tough regulatory scrutiny as public resistance increases and politically driven decisions emerge. This push-back could take the form of disallowing the valid recovery of capital or operating costs—i.e., a return with a vengeance to the era of second-guessing by regulators. Alternatively, regulators could increasingly pursue the recent trend of reducing allowed rates of return on common equity. In the end, we can expect a mix of the two as regulators and politicians attempt to push some portion of environmental and energy security costs onto shareholders, rather than further stress a broad consumer constituency.

Breakdown of rate of return regulation. The third constraint is the possible breakdown of the traditional regulatory compact altogether. As utility grid demand declines in the face of mandated DSM and distributed generation, erosion of the asset base will accelerate as aggressive renewable portfolio standards are increasingly met through power purchase agreements (PPAs). Rate decoupling may provide one solution. If it is designed well, it will protect revenues while

sending a powerful demand reduction signal as unit prices increase. However, it puts less flexible energy-intensive industries at a disadvantage, and it is potentially unsustainable politically as retail unit prices tick up. Again, shifting a portion of the burden to shareholders may be too tempting for regulators to ignore.

The importance of these constraints for utilities should not be underestimated. In the face of more than US$1 trillion in needed generation and grid investment, shareholder returns will be under pressure. The credit crunch has a highly uncertain life span, but it is likely to spawn a small wave of balance sheet–driven consolidations as firms look to reduce aggregate working capital needs and capture economies of scale wherever they can.

The first wave of opportunistic transactions came immediately on the heels of the broader liquidity crisis. The harbinger of things to come was First Reserve Corporation's equity infusion into Reliant Energy. This was followed by MidAmerican's acquisition of Constellation Energy and Exelon Corporation's currently proposed hostile acquisition of NRG Energy. These transactions provide case studies on the power of strong, liquid balance sheets to drive consolidation in the sector. This trend will likely continue and accelerate during the next few years as balance sheets are stressed to support massive capital programs and as rating agencies increasingly scrutinize commercial counterparties.

Refocusing on Performance: The New Frontier

The changing market is redefining business paradigms—thrusting new, or rarely used, capabilities to the leading edge. Embedding and sustaining a performance culture—focusing on both the capabilities that the evolving market demands and the permanent need for improved core cash flow—is the next challenge. Innovatively revising ingrained ways of doing business, and successfully building new capabilities, will require leaders to look at the enterprise through a markedly refocused lens—one in which leading performance models dominate. Those who get it right will retain or improve their financial health and grow. Those who get it wrong will face declining operating margins, stranded capacity due to CO_2 constraints, and, ultimately, potential acquisition by stronger rivals.

And though this imperative may sound daunting, the fact is that new opportunities to improve capabilities abound. We see at least five major areas in which almost all market participants must transform their capabilities.

- *Capital allocation and optimization:* informed and disciplined capital deployment based on rigorous portfolio value, life-cycle cost, and performance and market risk analysis

- *Productivity management:* deployment of innovative operating models and practices (integration of information, technology, and people; explicit, rolling performance measurement and incentives) focused on more efficient and effective utilization of resources

- *Risk management*: formal, independent risk assessment and management capabilities to support large capital project financing and development

- *Project development management:* the renaissance of overlooked project-development capabilities to minimize execution risk, reduce dependency on third-party PPAs for supply needs, and provide growth opportunities within and outside the regulatory compact

- *The new customer model:* a consumer and industrial marketing focus to drive demand-side solutions, based on customer intelligence, product and service development, and management

The changing market not only requires improved strategic capabilities but also places a premium on the superior execution of core management processes to generate free cash flow and to counter retail price pressure. Core process performance, despite being addressed for years, is still in need of a fundamental change. Companies can still achieve double-digit gains in core operations—and, in many cases, can do so in conjunction with the expected attrition of their aging workforces.

Indeed, the shift toward advanced interconnectivity—with intelligence and control embedded in the backbone of the smart grid and distribution automation—suggests that utilities might entirely reimagine work practices to create a more productive knowledge worker in the field. Moreover, enabled end-user consumer channels—those allowing customers more leeway to resolve issues like billing inquiries themselves—will likely reduce consumer-generated work demands while improving the quality of customer interactions. Further, opportunities abound to improve support functions, such as supply chain and general and administrative activities, by implementing broader underlying performance enablers, such as metrics, incentives, and workplace flexibility.

A Call to Action: Seven Strategic Tenets for Leading Utilities

Given the challenges facing the industry, what will define the utilities destined for long-term success? While many winning models may exist, we believe that sustainable victors will aggressively pursue, in some form, the following seven strategies:

Restructure the business portfolio. Coldly rationalize your business portfolio with an eye toward viewing the current environment as an opportunity, not just to prune, but to pursue selective growth and acquisition strategies. Winners don't just go through a recession; they grow through it. Bargains are out there, and many companies will be looking for a lifeline from stronger, better-capitalized companies.

Invest, diversify, and increase energy supply scale. Consistent with the approach to the portfolio, well-positioned generators should look to acquire assets in the downturn and select well-positioned markets to aggressively build scale in technologies with lower carbon exposure. This is not the time to be shy, as the window of opportunity for this market cycle is rapidly closing.

Develop a marketing capability to drive demand-side value. Most utilities, but especially those that are more focused on the demand side, must overhaul their approach to marketing and develop a customer-centric focus comparable to that of leading consumer and industrial marketing organizations. Alternately, they can consider finding a channel partner with those capabilities. Doing so will necessitate integrating C-suite-level marketing and customer service capabilities, with a strong link to resource planning.

Build the AMI/distributed automation backbone. Investing in the smart grid backbone, which offers the potential for future incremental expansion in end-use functionality, is the one action least likely to invite regrets later. Although its full potential is years away, the backbone provides core operating performance efficiencies and reliability improvements that will repay the investment. Utilities must be cautious, however, not to overinvest in end-user-focused enabling technology before customer receptivity and regulatory schemes improve.

Redefine the regulatory compact to reflect the likely future. Rate decoupling, expanded rate of return recovery for alternative investments, and quick-recovery schemes for construction work-in-progress will provide less distorted market incentives and the mechanisms to protect shareholders as pressures mount for artificial methods to constrain base rate increases. Comprehensive, as opposed to surgical, regulatory strategies that minimize engineered subsidies will provide long-term protection for shareholders and ratepayers.

Manage capital and project risk relative to balance sheet scale. Leading utilities will make ruthless and robust decisions regarding their capital. They must begin with an analysis of scenario-based risk, sensitivity, and real options to assess the high variability in potential outcomes and to realize a lower average cost of capital, even in an illiquid market. Rigorous capital governance and an ability to distinguish between high-value and low-value investment choices are critical.

Develop a capabilities and performance blueprint for the future. Ultimate success will require a well-defined blueprint for executing your plan, including the development of strategic capabilities and performance enablers, such as people management and technology. The blueprint should include a clear road map forward and an explicit definition of desired performance outcomes.

As we look ahead to 2009, we believe the appropriate executive mind-set will combine technology awareness, the appreciation of interactive market dynamics, a push to expand options, and a sustained outreach to regulators, all with a clear view to the future and a dash of caution. The industry's three major challenges—choosing the right technology, managing the balance sheet, and refocusing on performance—will not be solved in 2009. But the next 12 to 24 months may be uniquely critical to laying the foundation for long-term success.

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