




UTILITY
PERSPECTIVES
2014



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Symposium Synopsis



2014 Symposium Brings Industry Leaders Together in the Big Apple

For 12 years, Quanta Services has been the proud host of the Utility Perspectives Executive Leadership Symposium. Each year the symposium has brought together energy industry leaders to share their perspectives, promote discussion and generate valuable insights. This day-and-a-half, invitation-only event draws together top executives from the electric power, oil, natural gas and renewables sectors, as well as regional and federal regulatory leaders in an interactive and open forum. As the only symposium that brings together leaders from across the energy industry at one defining event, Utility Perspectives provides a unique opportunity to discuss issues that cut across the industry.

The 2014 symposium, held at the Ritz-Carlton New York, Battery Park hotel on October 6 and 7, focused on the industry's most pressing and important topics. The location offered sweeping views of America's most iconic symbol of freedom and all that Lower Manhattan has to offer, from Wall Street to South Street Seaport and the 9/11 Memorial. This synopsis includes highlights from the speakers and panel discussions and provides a glimpse of the 2014 symposium and perspectives.

2014 Utility Perspectives Profile

Symposium attendance was at an all-time high, as the attendance reached 169 participants. Rudy Giuliani, former Mayor of New York City, was the guest speaker for dinner after the opening day of the symposium.

While the speakers and panel discussions formed the core of the symposium schedule, various tours, activities, receptions, breakfasts, lunches and dinners provided additional opportunities to continue discussions, network with peers and make new acquaintances.

Executive-Level Group



Speaker and Panel Highlights

Keynote Speaker: Audrey Zibelman, Chair, New York State Public Service Commission

Audrey Zibelman, an industry leader and recognized national and international expert in energy policy, markets and Smart Grid innovation, shared her perspectives on improving New York's energy infrastructure including why change is needed, what NY is driving toward, and how to get there.

- **Change is needed to address current and future challenges:** Drivers for change include common challenges such as aging infrastructure, slow load growth, deteriorating load profile, clean energy requirements and increased adoption of DG and storage as well as post-Superstorm Sandy calls to minimize electric power system vulnerabilities.
- **NY is driving toward a market-driven, clean energy innovation:** The Commission commenced its "Reforming the Energy Vision" (REV) initiative to promote more efficient use of energy, deeper penetration of renewable energy resources, wider deployment of distributed energy resources, such as micro grids, on-site power supplies and storage. Expected REV outcomes include market animation, system efficiency, system reliability and resiliency, and environmental and economic sustainability. The belief is that we are near a tipping point in getting the market to drive innovation rather than the regulator.
- **Regulatory reforms to shape the roles and responsibilities of the regulated utilities and retail markets:** Initial focus is on optimizing demand through product and service innovations, price signals, demand response, service differentiation and data analytics. The regulatory model is changing. Must incentivize the utility for integration and purchasing customer resources vs. traditional model of earning on invested capital. Metrics and earnings opportunities to be aligned with customer value and be outcome based.
- **Looking at many different ways to solve energy issues:** NYPSC involved in driving customer-related energy resources and related incentives (NY-SUN Initiative), expedited review for transmission line projects that can be built within existing or state-owned rights-of-way, cost recovery for selected energy infrastructure projects that fulfill public policy requirements, policies to promote upgrading transmission capacity from clean upstate sources to downstate load centers, development of micro-grids and distribution tie lines to minimize storm vulnerabilities, and incentives to encourage conversion to natural gas and to accelerate the replacement of leak-prone pipe.

Keynote Speakers:

Audrey Zibelman – Chair, New York State Public Service Commission

Tony Clark – Commissioner, Federal Energy Regulatory Commission

Gordon van Welie – President and CEO, ISO New England

Featured/Guest Speakers:

Ed Martin – President & CEO, Nalcor Energy

Jeff C. Wright – Director, Office of Energy Projects, Federal Energy Regulatory Commission



Keynote Speaker: Tony Clark, Commissioner, Federal Energy Regulatory Commission

Commissioner Tony Clark shared his wealth of experience and perspectives on the development of domestic energy and energy infrastructure. A few of the key topics he discussed are outlined below.

- **Irresponsible to assume that energy delivery infrastructure is no longer needed:** People have been predicting the end of oil, coal, utilities, etc. for years and have been very wrong. Historically, energy supply has not been the issue, but rather delivery infrastructure.
- **The shale revolution continues to be a big story:** United States was supposed to be a big importer of natural gas. That has changed significantly. Currently, about 75 percent of energy used in the United States is from North America. There are a large number of shale-related infrastructure projects under review at FERC. Global energy dynamics are the key to understanding geopolitical issues and the United States' increasing energy security is weighing heavily on the geopolitical landscape.
- **U. S. energy security is within reach:** In the last 40 years many U.S. presidents have talked about energy security, but only now is that goal within reach. Keys will be exploration incentive and regulations at the state level and FERC pipeline siting.
- **It's all about the energy infrastructure:** The United States is the envy of the world in regard to energy resources, infrastructure and resulting high standard of living. However, the United States has underinvested in its rail and pipeline systems. There are too many stories of generating plants scraping the bottom of their coal stores due to rail constraints. Last winter, natural gas prices stayed low on the coldest days in most of the country except in the northeast United States due to pipeline constraints in the region. Investing in infrastructure is central to alleviating key energy constraints in the United States.



**Keynote Speaker: Gordon van Welie,
President and CEO, ISO New England**

Gordon van Welie has been actively involved since 2000 in the establishment and growth of advanced wholesale electricity markets and a robust regional system planning process in New England. More recently, he has directed ISO initiatives to address the interdependency between the gas and electric systems, facilitate renewable power integration and pursue smart grid technology applications. As a keynote speaker, he shared his thoughts on managing the reliability of the electric grid while the power industry undergoes rapid transformation. Some of the main points presented are outlined below.



- **New England’s grid will look very different in five-to-ten years:** Moving to a “Hybrid” grid with grid-connected and distributed resources, and a continued shift toward natural gas and renewable energy. More than 3,000 MW of non-gas generation has announced retirement in the coming years. ISO-NE’s interim distributed generation forecast predicts steady growth in solar PV through 2023. Energy efficiency investments are producing results. Peak demand growth is lower; energy use is flat.
- **Winter operations shed light on some difficult realities:** Operational options are very limited and becoming more constrained. Current pipeline infrastructure is inadequate to serve region’s natural gas-fired generation. High gas prices drove wholesale electricity prices to record levels over the past two winters. Pipeline constraints last winter resulted in a shift to coal and oil resources and higher emissions. The region is very vulnerable to the loss of large non-gas generators during cold weather (e.g. nuclear units).
- **Potential resolutions:** What the region needs is a responsive fleet of generation (with adequate fuel infrastructure) and demand-side resources to balance variable renewables. Additional transmission investments are needed to integrate renewables. Two FERC orders provide forward capacity market enhancements starting in June 2018 that will provide strong incentives for resources to invest in secure fuel arrangements, capital improvements and adequate maintenance and staffing. The ISO is creating stronger incentives that will increase over time for gas generators who install dual-fuel capability or contract for LNG (through the 2014–2015 winter reliability program and PFP).
- **Challenges ahead:** New England is in a precarious operating position for several winters due to inadequate gas pipeline infrastructure and retirements that have already taken place. Further non-gas generator retirements and/or outages will exacerbate reliability concerns. Recent ISO and FERC actions will improve long-term resource adequacy and performance, but this alone may not result in timely investments in additional gas infrastructure. The States will have to decide whether to wait for a market response, or to facilitate the infrastructure investment.

Featured Speaker: Ed Martin, President & CEO, Nalcor Energy

Ed Martin, a veteran of more than 30 years in the energy industry and the Energy Council of Canada's 2013 Energy Person of the Year, described Nalcor's transformational management of Newfoundland and Labrador's energy resources and shared his perspectives on sound leadership.

- **Facing similar challenges to others in the industry:** Challenges include aging infrastructure, need to modernize, transforming economy and harnessing energy resources for export.
- **Decided to build legacy for future generations:** Conclusion was that there was no other choice than to take control of the situation and future. Developed long-term energy roadmap with a bold vision. Involved transitioning to a balanced portfolio of oil, gas, hydro and wind.
- **Promising future projects:** Muskrat Falls and Gull Island hydroelectric potential make the lower Churchill River in Labrador the best undeveloped hydroelectric source in North America. Other future projects noted include development of vast off-shore oil and gas potential, and major DC transmission lines to link resources to the rest of the province and the United States. Clean energy from Newfoundland and Labrador may be a solution for the northeastern United States, where resources are constrained and replacement costs for aging infrastructure will be huge.
- **Leadership recommendations and wisdom:** Bring all key decision makers together (employees, government, customers, etc.); Develop long-term vision and write it down; Put the right people in the right seats (motivation and dedication key); Leave it all on the field; Invest significant capital; Insure leaders have integrity and courage.



Featured Speaker: Jeff C. Wright, Director, Office of Energy Projects, Federal Energy Regulatory Commission

Having been with FERC for parts of five decades, Jeff Wright has been at the center of U.S. energy development. Given his insider perspective on the industry, Mr. Wright presented "A View from the Beltway" on the U.S. gas supply and demand outlook, including potential implications and obstacles. The following are some of the highlights.

- **Supply outlook for U.S. gas driven by shale development:** Marcellus shale play now produces more gas than Qatar. About 75 percent of U.S. gas supply in 2040 is expected to be from unconventional sources. A lot of development in the Marcellus shale basin but very little development in Bakken shale basin. In all, FERC-related projects and potential projects in shale basins total more than 8,000 miles of pipe and 70 Bcf a day of capacity.



- **Demand outlook for U.S. gas driven by electric power generation:** U.S. demand for gas is expected to grow by nearly 30 percent in the next 27 years. The growth is expected to come largely from electric power generation.
- **Gas surplus expected around 2017-2018:** The 2014 outlook for U.S. natural gas supply vs. demand forecasts a surplus of gas in the next three-to-four years. The surplus is forecasted to grow to 4.8 Tcf by 2040.
- **Gas exports expected to increase significantly:** Given the outlook for U.S. gas surplus, exports to Mexico and abroad are expected to grow. Based on proposed pipeline projects, gas export capacity to Mexico could more than double to 11 Bcf a day. Approved LNG terminals could add another 7.2 Bcf a day in export capacity by the end of the decade.
- **Potential implications and obstacles seen:** Despite the promising outlook, there could be potential obstacles such as opposition to new infrastructure from landowners and non-government organizations. Political fighting could create delays. Infrastructure may not be developed where it is needed most to ease constraints. There is also much more to be decided on LNG export in terms of number of facilities and impact on domestic market.

Panel: Monday Executive Roundtable

This panel brought together electric power and natural gas industry chief executives and administrators to share perspectives on a wide range of topics including infrastructure investment drivers, system deficiencies, the grid and utility of the future and grid security. Some of the highlights from this discussion are outlined below.

- **Long-term clarity vital to investment in energy infrastructure:** Regulatory transparency was crucial in attracting \$7 billion CREZ transmission investment. Regulatory certainty provided by electric and gas infrastructure modernization legislation in Illinois and Indiana have spurred major investment initiatives in these states. Many states legislators have recognized that infrastructure investment is a job creator. Regulatory clarity and timeliness of recovery in Texas has allowed utilities to increase capital spending two-to-three times historical levels to address reliability issues, pipeline integrity, aging infrastructure and grid modernization.
- **Coordination between electricity and gas supply key to not “getting caught with our plants down” again:** January 2014 exposed the energy deficiencies and constraints in the northeast. The current situation is not sustainable. Winter gas constraints will curtail gas plants, as LDCs have priority. Dual fuel generating plants will be a big part of the solution. Questions remain about sufficient firm capacity to justify firm gas supply.
- **Building the grid of the future will not be easy:** The grid of the future will not be radial but rather more interconnected similar to the internet, especially at the distribution level. Designing the grid to accommodate resources in a plug-and-play manner will become the standard. Growing needs to replace aging infrastructure provides great opportunity to modernize as well. Storage will be a critical part of the future grid and will be here sooner than most people think. Residential storage is not economic yet but costs are dropping rapidly. Combined heat and power is happening with some large hotels, for example, achieving 80 percent efficiency. Will likely see an increasing number of synchronous microgrids vs. non-synchronous/emergency microgrids. However, many customers have no desire to manage a microgrid at this point.

Moderator:

Pat Wood, III – Principal, Wood 3 Resources and Former Chairman, Federal Energy Regulatory Commission

Panelists:

Terry Boston – President & CEO, PJM Interconnection

Elliot Mainzer – Administrator, Bonneville Power Administration

Richard Mark – President & CEO, Ameren Illinois

Ed Martin – President & CEO, Nalcor Energy

Scott Prochazka – President & CEO, CenterPoint Energy

Bob Shapard – Chairman & CEO, Oncor

- **The utility of the future is about the grid of the future:** Expectation is that the utility of the future will be heavily focused on the grid. The fundamental concerns for most customers are still electricity prices and reliability. Although there have been some articles recently declaring the death of the grid or impending death spiral of the utility, the day that the grid becomes obsolete is expected to be many years or decades in the future. Important for utilities to get the rate structure right. Rate structures should properly value distributed generation grid connections to avoid a “Hood Robin” scenario in which the poor (non-owners of



DG) are subsidizing the rich (those who can afford DG). Some believe that an independent system operator (ISO) for the distribution system similar to those used for transmission systems may be the model for the future.

- **Key question for physical and cyber security of grid: how much are customers willing to pay?** Impractical to physically protect infrastructure against all possible threats. Focus must be on resiliency and recovery. However, are customers willing to pay for the redundancy needed to withstand the loss of a major substation? These are the kind of questions being asked. As an industry, a lot more standardization of long lead-time equipment is needed to increase strategic spares and make recovery easier. Again, growing needs to replace aging infrastructure provides great opportunity to design and build in redundancy, security, and standardization.

Panel: Tuesday Executive Roundtable

This panel followed a similar format to Monday’s executive roundtable session but took a closer look at some operational issues and challenges facing the industry. Panelists shared their perspectives on addressing public and employee safety risks, the transition to cleaner generation, balancing infrastructure expenditures and rates, and conveying the value of their actions. Some highlights from the discussion are provided below.

- **Public and employee safety risks driving increased expenditures:** Public and employee safety has long been of highest importance to utilities. And, now, for some utilities, it is becoming the central focus and driver of their budgeting processes and rate cases. Identifying risks and controls for elements of electric and gas infrastructure as well as other parts of the business is a central part of the process. The approach has resonated with customers. Regulators have been supportive and, in California, even prescriptive about having a more risk-driven process. Expect to see continued increase in the use of technology to monitor and detect equipment deficiencies and hazards.
- **Implementation of Clean Air Act Section 111(d) to drive significant infrastructure investment:** Implementation of the act is leading to numerous electric generation unit retirements. Major changes to the electric generation landscape changes the flow of power and transmission infrastructure requirements. Efficiency of the transmission system is seen as key in helping to reduce carbon emissions. This has already led to significant transmission system upgrades and many more are expected as implementation of the act unfolds.

Moderator:

Barry Smitherman – Commissioner,
Railroad Commission of Texas

Panelists:

Lisa Barton – Executive Vice President,
AEP Transmission, AEP

Terry Donnelly – Executive Vice
President & COO, ComEd

Mark Julian – Vice President, Utility
Operations, First Energy

Gil Quiniones – President & CEO,
NYPA

Greg Reimer – Executive Vice
President, Transmission, BC Hydro

Geisha Williams – Executive Vice
President, Electric Operations, Pacific
Gas & Electric

- Major challenge in balancing infrastructure investment needs and affordability of rates:** Spending has increased substantially on aging utility infrastructure, grid modernization, system integrity/safety risks, emission reduction compliance and other areas. Most states now have some form of formulaic ROE/cost recovery mechanism in place. Given the success of these mechanisms, more states will follow. The concern is the pressure on rates. Even customers that have some of the lowest rates in North America do not like rate increases. More challenges are expected as utilities try to develop workable solutions to accommodate various competing objectives.
- Focus is on conveying the value of what we are doing:** Changes to the grid must occur in order to accommodate increasing levels of distributed resources and maintain bulk electric system reliability given 111(d) plant retirements. Sustaining investments are needed to replace failed equipment and improve the integrity and safety of electric and gas delivery infrastructure. The value of these investments is not understood by many. Utilities and the industry are working to do a better job of conveying the benefits of energy infrastructure development in terms of economic improvement, jobs growth, clean air, sustainability, regional and national competitiveness, and more. The energy discussion has moved beyond just keeping the lights on, but more can be done to connect investments with state, national, and international objectives.



Panel: North American Pipeline Infrastructure Session

This panel brought together top executives from North America's pipeline companies to discuss advancements and challenges in the industry. Panel discussion topics included lessons learned from the extreme winter conditions, overcoming pipeline develop opposition, pipeline repurposing, supply and demand dynamics and possible future disruptive events for the industry.

- Important lessons learned from Polar Vortex:** This year's extremely cold winter reminded everyone that prices are driven by the laws of supply and demand. Electricity prices last winter in the northeast were twice as high as prior years due primarily to pipeline constraints affecting power generating plants. The pipeline infrastructure performed well but issues with firm vs. non-firm gas supply contracts were evident. Gas storage was critical but this experience showed that more is needed.
- Despite opposition from some, additional pipeline infrastructure aligns with national goals:** The general theme of opposition is stop everything having to do with fossil fuel – oil sands, drilling, fracking, pipelines, exports and pipelines. Organized opponents have determined that the way to stop fossil fuel development and use is to target the pipeline and delivery system. However, pipeline infrastructure supports jobs growth, energy security and sustaining/improving standards of living. Opposition-driven delays of pipelines, such as Keystone, have led to rail capacity issues for other goods and commodities, and have raised rail safety issues and concerns.

Moderator:

Donald F. Santa, Jr. – President & CEO, Interstate Natural Gas Association of America (INGAA)

Panelists:

Stan Horton – President & CEO, Boardwalk Pipeline Partners

Robert Jones – Senior Vice President Major Projects, TransCanada

Evan Kirchen – Vice President, Engineering and Construction, Williams Company

Byron Neiles – Senior Vice President, Major Projects, Enbridge

Joe Ramsey – Group Vice President, Project Execution, Spectra Energy

Jesus Soto – Senior Vice President, Gas Transmission Operations, Pacific Gas & Electric Company

- **Pipeline repurposing attractive but challenging:** The interest in pipeline repurposing is being driven by the need for more pipeline capacity. This includes conversion (from oil to gas and vice versa) and flow reversal demands. However, repurposing can introduce pipeline integrity issues and new regulatory requirements that make some repurposing projects less attractive financially.

- **Changing safety and integrity requirements driving investment in existing pipelines and technology:** New safety legislation and the elimination of grandfather clauses for older pipelines in safety regulations have led to a significant increase in pipeline testing and



upgrades. Many of the pipelines effected are in heavily populated areas making upgrades more expensive. Similar legislation and regulations are expected for oil pipelines as well. Also, more guidelines are expected for gas distribution lines, particularly for leak-prone cast iron pipes. Given these changes, there is a need for to improve and expand technology for monitoring, testing and controlling.

- **Supply and demand key for energy exports:** Supply and demand dynamics will drive energy prices and the economics of export infrastructure development. Oil and gas prices must be high enough to attract investment in export facilities. If energy prices are too low and/or export facility costs too high, U.S./North American export will not be competitive with the Middle East, Africa, and Australia. LNG export facilities would drive significant infrastructure investments to get pipelines into these areas. Resurgent U.S. petrochemicals industry is opposing energy exports to keep domestic prices low. Fossil fuel opponents are using the anti-export arguments to oppose all pipeline development.
- **Several grey swan events could be equivalent to a black swan for the pipeline industry:** The natural gas and oil price differential has been a substantial driver of pipeline development. If the price of oil continues to decline, natural gas pipeline development will be hurt. The cost to do projects has been roughly doubling every few years. If this cost trend continues, the economics for new projects will not workout at current energy prices. Continued opposition to fracking, particularly a ban in Canada would have a big impact on pipeline development. If other countries with shale formations outside of North America start to use fracking technology, world supply and demand dynamics would be disrupted. Domestically, we must be prudent operators of energy infrastructure to avoid environmental and safety issues.



Panel: Engineering a Changing Grid

This panel brought together industry leaders to discuss a variety of grid-related topics including infrastructure refurbishment, modernization, 111(d) impacts, PV/DG penetration, security, and storm response. Highlights from this discussion are provided below.

- **Refurbishing and modernizing the grid still a core focus:** Increasing work to refurbish and upgrade infrastructure including manholes, mainline cable, poles, meters, automation and smart switching. Grid resiliency has been a key focus also including substation flood mitigation, transmission reconductoring and replacing wood pole transmission structures with steel structures.
- **Major grid transformation underway:** Clean Air Act Section 111(d) will result in a substantial number of generating plant retirements. Many new gas plants will be built and a major build out and upgrade of the transmission system will be needed to accommodate these changes.
- **Hawaii is a postcard from the future for DG:** Hawaii has huge PV penetration. Approaching backfeed on 30 percent of distribution feeders. The challenge is to figure out how to use it. The constraints are not at the distribution feeder level but at a system level for an island grid. Must have flexible generation or have to curtail PV. Storage will be a huge part of the solution for Hawaii. Customers view rooftop PV as their choice and do not understand why the utility is allowed to limit PV installation. More than 90 percent of Hawaii customers believe that the utility is undermining the process to protect their investments.
- **What's needed for more DG:** A diversity of distributed generation resources is needed. Getting the model right sooner rather than later is critical based on Hawaii's experience. Hawaii has a big legacy issue with customer-owned rooftop PV systems and is looking at an extensive inverter change out program. It is clear that net metering is not viable long-term. The key is the spread between electricity prices and PV prices. Customers could decide to store their PV output during the day and sell it back at peak demand. Time of use prices could significantly improve the economics of customer storage. May need more of an independent grid operator at the distribution level. Non-technical breakthrough solutions, similar to solar system financing, are also needed. Some companies are looking at aggregating rooftop solar to provide additional value.



Moderator:

Alison Silverstein – Consultant, Alison Silverstein Consulting

Panelists:

Michelle Blaise – Senior Vice President, Technical Services, ComEd

Mike Champley – Commissioner, Hawaii PUC

James P. Fama – Vice President, Energy Delivery, Edison Electric Institute

Nancy Floyd – Founder and Managing Director, Nth Power

Kathy Shea – Vice President, Transmission Projects Development, Northeast Utilities

Steve Whitley – President & CEO, New York ISO



- **Security efforts focus on prevention and recovery:** Given all of the possible targets and potential ways of causing damage, hardening the system to prevent potential attacks may be infeasible. Improving our ability to recover from attacks may be the more prudent approach. Efforts are underway to improve standardization spare stock sharing of long lead-time equipment. Efforts are also underway to address substation transformer transportation limitations.
- **Storm response improved with experience:** The northeast U.S. experienced four 100-year storms over a 19-month period. Much was learned from these events. New systems have been developed to provide more information to towns, track crews and track outage restoration. Hardening projects have been initiated for identified critical facilities. More improvements have been made on mutual aid and use of contractor resources.

Panel: North American Electric Infrastructure Session

This panel of electric industry executives and advisors discussed a number of topics related to electric infrastructure development including investment drivers, rate impacts, communicating investment benefits, order 1000 and grid security.

Highlights of the discussion are outlined below.

- **Worried about infrastructure investment needs and rate fatigue:** System investment needs are huge and growing. Expenditures to address safety risks, replace failed infrastructure, modernize the grid, integrate renewables, address security threats and deal with generating plant retirements may be more than customer bills can support. What gives then? Do we accept risks and worsening reliability?
- **Need to rethink how infrastructure investment is being sold:** The case for needed infrastructure development is being expanded beyond utility and energy commissions to include state and federal leaders, legislators and policy makers. Are starting to see more public/private partnerships to address common goals related to clean energy, DG, jobs grow, grid resiliency, etc. More can be done to connect and communicate the benefits of a modern and resilient energy system. More interaction with energy/electricity similar to cable, internet, and cell phone services may drive a better understanding of value. The industry needs to look at this as a more of a proactive campaign to enlist broader support and interest beyond major storms or other outage events.

Moderator:

Nora Brownell – Founding Partner, ESPY Solutions, Former Commissioner, Federal Energy Regulatory Commission

Panelists:

Brad Gammons – General Manager, Global Energy and Utilities Industry, IBM

Jon Jipping – Executive Vice President & COO, ITC Holdings Corp.

Scott Moore – Vice President, Transmission Engineering and Project Services, AEP

Gordon van Welie – President and CEO, ISO New England

Stephanie Raymond – Vice President Transmission & Substations, PPL Electric Utilities



- **Doubts persist about ability of FERC Order No. 1000 to address transmission development needs:** Many regional entities were already successful in getting transmission lines built based on reliability justifications. Order 1000 is seen as adding complications to processes that were already working but not addressing specific issues that needed attention, such as siting.

Advancement toward goals of increased innovation and regional and intra-regional collaboration does not seem to be happening. Rather, the outcome appears to be a singular focus on marginal price differences. Costs are generally the same yet additional front-end costs have been added. There are concerns that Order 1000 will actually delay transmission development, hamstringing efforts to address the impacts of the Clean Air Act Section 111(d).

- **Continued advancement being made on cyber security:** Utilities have added several full-time equivalent positions to focus solely on cyber security. Cyber security efforts have the feel of an arms development race. Increased spending in this area is expected to continue. Likely to see third-party cyber security audits as in other industries. Similar to the challenges of physical security, it likely impossible to protect against all cyber threats. Therefore, resiliency investments to more quickly recover from attacks or contingencies will be a major focus area.







The 2015 Utility Perspectives Executive Leadership Symposium

We sincerely hope that the 2014 Utility Perspectives Executive Leadership Symposium was an enjoyable and rewarding experience, and we welcome any comments or suggestions on improving the event. Thanks again to all who helped make this event a success.

Please save the date for the Utility Perspectives 2015 event which will be at the Fairmont Miramar Hotel & Bungalows in Santa Monica, California, October 4-6. Nestled atop the scenic bluffs of Santa Monica beach, with panoramic views of the Pacific Ocean, this celebrated seaside resort has been a popular retreat for nearly a century.



More information about Utility Perspectives can be found at www.utilityperspectives.com.

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To learn more about how Quanta can help you realize your organization's goals, contact Ben Bosco, senior vice president of business development at bbosco@quantaservices.com or 713-985-6403.



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