# QER Public Stakeholder Meeting

# Boston

# Takeaway Summary

Panel 1

- There is a need to invest in the transmission infrastructure. Renewables are located far from load centers. In addition, some transmission assets are aging.
- The nature of power generation is changing with greater emphasis on natural gas. Industry and regulators/policy makers need to adapt.
- Natural gas supply, and its distribution infrastructure, is constrained in the northeast.
- Decentralized power generation represents both promise and challenges. Challenges include reliability and methods for recouping the cost of maintaining base load power if revenues drop as a result of increased decentralized power gen.
- Let markets work.

Panel 2

- Greater visibility is needed into grid operations. This includes better data in terms of supply (including distributed resources), and where/how demand is occurring. This will enable better analytics and better planning and decision making.
- There needs to be better engagement with customers. There are opportunities to educate them on their energy usage, how an understanding of energy usage can help them to reduce costs, and opportunities for improving energy efficiency / reducing energy use.
- We need to have the right price signals for electric power.
- There is a need to help both residential and industrial customers reduce energy costs; energy efficiency investments need to be affordable.
- Regulate the outcome, not the process. Don't pick technology/resource winners and losers.

Panel 3

- Identify policy objectives and let markets determine the best approach to reaching those objectives.
- Re-evaluate how regional market constructs, regional power pools are designed and look for opportunities to improve efficiencies.

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# Opening Panel

## Charlie Baker, Governor of Massachusetts

- Every governor in the Northeast region believes Canadian hydroelectric power is fundamental to succeed economically and environmentally in the future.
- There is great interest in energy storage in Massachusetts, and his administration plans to spend many millions of dollars on building on nascent initiatives.

## Dr. John Holdren, Director of the White House Office of Science and Technology Policy

- QER History: The Obama Administration launched the QER as part of the Climate Action Plan in June 2013. It has a moving spotlight approach. First report is on energy TS&D. Second report is on electricity.
- Changes in energy landscape: On the generation side, he highlighted the decline of coal and the increase of natural gas, wind power, and solar energy. Energy efficiency improvements include the widespread use of light emitting diodes and the advent of electric cars.
- Obama Administration Action on Climate Change: Worked with Congress to pass the Recovery Act, providing funding for cleaner, more efficient electricity supply and use; and leading to the first combined fuel economy GHG standards for light duty vehicles. Developed new energy efficiency standards for appliances and targets to reduce GHG emissions.
- Progress made under the three pillars of the National Climate Action Plan to reduce GHG emissions. Highlighted progress at Paris meetings, brokering 195 national commitments to reduce GHG emissions between now and 2030 and supporting Mission Innovation to promote R&D on clean energy technologies.

## Dr. Ernest Moniz, U.S. Secretary of Energy

- Highlighted analytical process and emphasized stakeholder engagement for QER.
- Achievements of QER 1.1: He stated that QER 1.1 has been reflected in various pieces of legislation passed at the end of 2015 as well as in the pending Energy Bill in the Senate.
- Framing issues for Electricity in the Northeast:

    - The impact of the changing generation mix on grid operations, planning, liability, and systems performance, including the ability to provide affordable electricity;
    - The increasing concerns over cyber and physical security risks;
    - Whether the current market structure allows for adequate investment in grid modernization;
    - And the implications of consumer connectedness to the grid.
- Importance of Innovation to Meeting Climate Objectives: Innovation central to Paris meetings, referencing Mission Innovation Initiative, the Breakthrough Energy Coalition, and the cost reduction over the last 6-7 years in wind, PV, storage, and LED technologies.
- He emphasized grid modernization as a budgetary priority and key enabler for many of the developments that we want to do.

### Question from Kate DeWolf on DOE's plans to improve the energy security and resiliency of U.S. military bases, given their vulnerability when the electric grid goes down

- Response from Secretary Moniz: DOE and the Department of Defense are collaborating on energy needs for fixed assets such as bases as well as the needs for the warfighter. Sandia National Laboratory is designing microgrids for a large number of bases. The Navy is also a major supplier of renewable energy, particularly solar. The Department of Agriculture is working on advanced drop-in of biofuels for use in military operations.

### Question on how the Secretary of Energy intends to continue its momentum beyond the current administration

- Response from Secretary Moniz: The next administration will make its own choices, but he advocates institutionalizing activities, such as the QER, that we think to have added value. The first installment of the QER had a major impact in legislation and other arenas.

## Panel 1: Bulk Power Generation and Transmission: How Can We Plan, Build, and Operate the Appropriate Amount for Future Needs?

### Panelists

- Stephen J. Rourke, Vice President-System Planning, ISO New England
- Richard Dewey, Executive Vice President, New York Independent System Operator
- Gil Quiniones, President and Chief Executive Officer, New York Power Authority
- Carolyn Browne Anderson, Director, Transmission Policy and Insurance, Green Mountain Power
- Dan Dolan, President, New England Power Generators Association
- Camilo Serna, Vice President for Strategic Policy & Planning, Eversource

## On the Changing Energy Mix

- The region faces four challenges that are interconnected at the bulk power level: 1) The system in New England is transitioning to natural gas. 2) The gas pipeline system coming into New England is constrained which has led to incredible market volatility and higher electricity prices. 3) Aggressive goals have been set in the region to reduce carbon emissions. 4) Retirements in generation capacity. (Camilo Serna)
- When you look at the reliability requirements to be able to balance that wind and to balance that solar, we need to work to find a way to keep the conventional generational within the market. (Richard Dewey)

## The Value of Competitive Markets

- Value of Markets: Competitive markets allowed for increased energy efficiency in the generation fleet, creating $6.5 billion in consumer savings and 40% lower carbon emissions. (Richard Dewey)
- The biggest challenge in the northeast is out-of-market intervention. Instances where markets are undercut: supporting utility affiliate generation and providing it out-of-market revenues, supporting individual types of resources, or contracting for hydropower outside of the marketplace. (Dan Dolan)
- Provide Open Marketplace for New Technologies: Establish a mandate and then let new technologies and innovations work towards that mandate. (Dan Dolan)
- Improvements Post-Restructuring of New England's Electricity Industry: (Dan Dolan)
    - Costs have dropped between 2003 and 2015, in spite of peaks in cold temperatures.
    - Environmental performance improved; states mandating lower carbon technologies.
    - Reliability is increasing and new investments are ready to support development of new plants as older plants retire. Only the most competitive units are succeeding.

## On Grid Operations and Transmission Needs

- Both Stephen Rourke and Richard Dewey highlighted the need for transmission infrastructure to connect renewable energy supply to major load centers.
- We need to figure out how to send the right price signal and the right operational rules so that those [DER] resources can be sited where they're most valuable. (Richard Dewey)
- Interregional coordination is vital for reliability planning, regional efficiency, and moving power from supply resources to load centers. (Richard Dewey)
- Transmission infrastructure investments are needed. In New York, there is a demand-supply imbalance between upstate and downstate. New state initiatives seek to alleviate congestion. (Gil Quiniones)
- NYPA is investing over $730 million in life extension and modernization of our grid. (Gil Quiniones)
- Need to carefully assess transmission grid investment decisions based on whether needs could be met in other ways through efficiency or another non-transmission alternative. (Carolyn Browne Anderson)

## On Distribution and End Use

- The grid of the future will reflect a more distributed market that leverages technology such as battery storage. (Carolyn Browne Anderson)
- Unpredictable Impact of New Technologies on Grid: Changes include integration of distributed resources, implementation of renewable standards, and tremendous growth on that scale, and the retirement of

some of the older, less efficient power plants. These innovative, potentially disruptive technologies will have an unpredictable impact in an uncertain future. (Dan Dolan)

- New York has been progressive in terms of incentivizing distributed energy resources. And the New York REV program is at the forefront, but it's really the industry that's going that way. (Richard Dewey)

## Consumer Value and Preferences

- Green Mountain Power (GMP) focuses on providing customer value. Offers them new energy products and solutions to saving them money and reduce the utility's carbon footprint. (Carolyn Browne Anderson)
- GMP is developing a new business model focused on a customer-focused distribution grid with energy located closer to load. (Carolyn Browne Anderson)

## New Technologies and Innovation

- NYPA-DOE Collaboration on New Technology: NYPA is working closely with DOE and its national labs on cutting-edge technology (e.g. dynamic line ratings). (Gil Quiniones)
- GMP is working to encourage distributed generation to locate closer to load using new analytical forecasting models and an online map of the grid and load centers to help developers locate new generation units. (Carolyn Browne Anderson)
- New generation technologies have lower emissions and the ability to quickly start up.
- New Innovative Products: GMP is partnering with Tesla on home battery storage system. (Carolyn Browne Anderson)

## Question on how to address challenges that increases in intermittent generation pose to reliability and availability of resources

- Speakers agreed that reliability is a concern given the challenges associated with intermittent generation and generally agreed that clean, high-capacity resources, such as hydropower from Canada, are valuable for meeting our emissions goals while maintaining reliability.
- Mr. Dewey provided an example of the extreme variability in wind power, where a 1800 MW wind generation source fluctuated from 1400 MW to 11 MW from one day to the next.
- Mr. Dolan: Capacity markets are important for meeting reliability standards.
- Ms. Andersen: Integrate smaller-scale base load power to deal with intermittent generation.
- Mr. Quinones called for demand-side flexibility and transparency of generation and transmission. More digitization of the generation and transmission system would provide the needed transparency into grid operations.
- Mr. Routke advocated for more cooperation and common analytics between bulk power and distribution entities. Very little of the new solar is observable by ISO operators.

## Question on efficiency in the market. Are they structured efficiently and are we moving in the right direction?

- The panelists generally agreed that we need to stick to market principals. Look to ways markets can value key attributes rather than "blunt force" policy.

- Two panelists said more needs to be done to reduce carbon emissions. Mr. Serna suggested other avenues for incenting renewables to meet regional goals, and Mr. Quinones said more needs to be done by the transportation and industrial sectors to meet climate goals.
- Two panelists cited efforts to promote the right price signals. Mr. Rourke noted zonal marketing as a tool for promoting competition, and Mr. Dewey mentioned FERC and the Electric Power Supply Association's work on price formation and preserving reliability.

### Question on whether investments in innovation in generation and transmission over the next 10 years are sufficient

- Progress in Innovation but More Needed: Panelists lauded progress in innovation, and said more investment is needed, particularly on the distribution side of the grid. DOE and the electric power industry have focused on innovation to decrease costs.
- Need Innovation in Rate Design: Still charge on a volumetric basis. The increased frequency of sharp demand peaks will continue and should be addressed by rate design.
- ARRA funding significantly improved situational awareness of the grid.
- Areas to improve: energy storage. Needs more research and innovation. Will help to resolve intermittency, and problems caused by sharp peaks.
- Question on availability of natural gas to the region as coal plants retire. Gas could become a year-round issue; gas needed in summer could outstrip gas needs for heating for winter.

### Final Comments for the QER Task Force

- Mr. Dewey said QER goals are admirable but need to use markets to achieve them.
- Mr. Quinones urged DOE to accelerate methods to collaborate and communicate (labs, states, federal). Improved partnerships will help industry transformation succeed.
- Ms. Andersen said clarity on federal and state jurisdiction would be helpful; encourage appropriate amount of investment without burdening customers; invest in ways to use data available from smart grid technologies; focus on energy storage.
- Mr. Dolan said to lay out the standards and policies – then allow innovation in the marketplace to meet it. Don't pick winners and losers.
- Mr. Serna: Focus on what customers need. Recent surveys reflect that customers want reliability first and foremost. There is an emerging preference for clean energy options.

## Panel 2: Electricity Distribution and End-Use: How Do We Manage Challenges and Opportunities?

### Panelists

- Ed White, Vice President, New Energy Solutions, National Grid
- Karen Lefkowitz, Vice President, Smart Grid and Technology, Pepco Holdings

- Dena Lee DeLucca, Vice President of Corporate & Member Services and Chief Financial Officer, New Hampshire Electric Co-op
- Roxanne D. Brown, Assistant Legislative Director, United Steelworkers
- Micah Remley, Senior Vice President, Product, EnerNOC
- Ned Bartlett, Undersecretary of Energy and Environmental Affairs, Commonwealth of Massachusetts

## Grid Operations

- With grid of the future, utility does not have the visibility into all points of the grid, which compromises grid operations. Need telemetry and real data to effectively operate the grid. (Karen Lefkowitz)
- [Some say if] you get a 15% penetration of DER, then you have to know what it is, and where it is and measure it. Well maybe it's 5%, maybe it's 25%, maybe 80%? I don't know. If we don't know when we need granular data, then we don't know how to make those decisions. We don't have the rights to that data and that is an enormous change. (Karen Lefkowitz)

## Customer Engagement and Customer Preferences

- Focus is on direct engagement with customers. New Energy Solutions runs pilot programs and demonstrations; works with REV in New York, Grid Mount in Massachusetts, and SIRI ["Systems Integration Rhode Island"] in Rhode Island. (Ed White)
- PEPCO's service area facing explosive growth in renewables and increasing acceptance of electric vehicles and filled with customers who are technologically sophisticated. (Karen Lefkowitz)
- In priority order, their members want lower cost, reliability, and help in managing their energy use; the NH co-op leverages technology to address these needs. (Dena Lee DeLucca)
- Members care about the bottom line of their bill. (Dena Lee DeLucca)

## Affordability and Social Justice

- PEPCO sees a fairness issue with the deployment of smart meters and distributional automation as a differentiation between income levels and between renters and homeowners. For instance, customers with the means to install solar PV can minimize their costs; O&M costs shift to customers without the resources to upgrade distribution transformers and maintain other grid infrastructure. (Karen Lefkowitz)
- The New Hampshire Electric Co-op is an electric distribution company serving a non-contiguous territory with a 36% seasonal member base; poses affordability challenges. (Dena Lee DeLucca)
- Manufacturing sector is shifting from oil and coal to natural gas over the last five years. However, in New England, one out of every four or five pulp and paper mills are closing permanently or temporarily closing in the winter because the cost [of natural gas] is too high. (Roxanne D. Brown)
- While the union recognizes a shift to renewable energy, there should be a thoughtful plan to consider how to serve customers. When an industry suffers and facilities close, it can cause the loss of economic activity in a city or town. (Roxanne D. Brown)

## Distributed Energy Resources

- Region needs new resources, new supplies, and additional gas and transmission infrastructures to address cost and reliability. Solar, wind, DG, and energy storage, and CHP can help. (Ned Bartlett)

## Technology and Innovation

- Cited example of $35 million communications and automated metering infrastructure project, in part funded by DOE, to address reliability issues posed by 89% forest cover. (Dena Lee DeLucca)
- EnerNOC is a technology provider to utilities and large commercial and industrial customers to assist in the management of their energy costs and consumption. (Micah Remly)
- Mr. Remly drew a parallel with using algorithms, similar to those that social media uses, to break an energy load profile into component parts. Then it is possible to make specific recommendations for energy efficiency for certain use cases or businesses. (Micah Remly)
- He also showed how EnerNOC applies machine learning to help customers with energy management. EnerNOC uses machine learning to combine energy consumption patterns and costs and provides customers with a prediction of their future costs so as to allow them to make changes to reduce their electricity usage. (Micah Remly)

## Question: Karen Lefkowitz mentioned the educated customer base that utilizes information and are motivated by environmental and other factors in making electricity consumption choices. Roxanne and others emphasized that affordability and reliability are key to industry. How do you serve these opposing views? How do you address those challenges?

- Ms. Lefkowitz: Utilities obliged to serve all customers without cherry picking; challenge is how to serve equitably. Also, [PEPCO] often prevented from acquiring generation. When battery storage is considered generation, it limits what [PEPCO] can offer low-income customers.
- Ms. Brown: Economic circumstances matter. EE plays a huge role for our industries. Technologies can help companies, but [economic] pressures creates challenges for R&D and EE spending.
- On customer preferences, Ms. Lefkowitz, Mr. Remly, and Mr. White agreed that in serving customers, cost comes first. It is beneficial when you can combine cost with finding innovative technology to provide renewable energy.

## Question on new grid technologies and the associated data and information—is there an inherent cybersecurity risk with potential to interrupt operations or breach customer data?

- The panelists agreed that the physical security of infrastructure remains paramount. Panelists had differing perspectives on customer preferences on privacy and information security.
- Mr. White and Mr. Remly generally agreed that customers' information sharing behavior has evolved, as has their preference of what [information] needs to be protected. Mr. Remly stated customers more likely to share personal information if they can see a benefit in doing so.
- Ms. Lefkowitz: Regulated utilities work to ensure security and privacy of customer data and report to PUCs, but other players such as developers of online apps may not be held to a comparable standard. However, customers may not care much beyond the protection of their banking information and information on whether they are home or not.
- Ms. DeLucca: New Hampshire Electric Co-op only monitors energy usage from a whole house perspective. However, members are still concerned that their power usage information would allow people to know whether they were home or not.

- On cybersecurity, Mr. Bartlett noted that from a state government perspective, preserving trust and integrity on the use of private information is key, and once lost, it is hard to repair.

## Question on how utilities value, operate, and plan for distributed energy resources, including energy efficiency and renewable energy. Do you have the resources you need to address this problem, and what impact do you expect it will have on grid operations and reliability?

- Ms. Lefkowitz: On the planning side, [PEPCO] is working on algorithms and technology to integrate renewable energy. On the operating side, the big challenge is not having visibility into the output [from distributed generation].
- Ms. DeLucca: The New Hampshire Co-op incentivizes PV installations but for fairness reasons does not provide the full retail rate for DG.
- Ms. Brown: Manufacturers need a reliable base load and CHP helps meet this need.
- Mr. Remly: Customers often have the ability to reduce load, but price signals are not right. Integration of DER will involve an all-of-the-above solution in getting people involved improving system planning, and improving real-time integration of data and the control system.
- Ms. Brown urged utilities to help industrials deploy energy efficient technologies.
- Mr. White stated that education is key in promoting energy efficiency. At the distribution level, we need to evolve more in how to value DER. Pricing is hard--DER in remote areas are not as valuable as DER near a load center.
- Ms. Lefkowitz stated that customers don't understand that for them to export energy from their house, the utility may have to invest in labor and resources to increase capacity on the line. However, we expect regulators and legislators to understand.

## Question on the regulatory environment and whether it is structured to support the changes that customers are asking for industry to make

- Mr. Bartlett: New England is complex in how the six states have different public policies, market structures, and the way they split up generation, transmission, and distribution. ISO New England has to manage all of that, and the situation is constantly evolving.
- Mr. White: Regulate the outcome, not the steps, to allow for more innovation for achieving aggressive energy efficiency goals while meeting our customers' needs.
- Ms. Lefkowitz: One of the biggest challenges is that the average tenure of a regulator is less than three years, and they face a host of big technical challenges without the budgets and expertise and staff to meet them.

## Final comments for the QER Task Force

- Mr. White: Focus on education on the front end and focus on innovations based on outcomes.
- Ms. Lefkowitz: We are committed to providing reliable energy and uniquely situated to serve as the integrator, balancing new market entrants, regulatory requirements, and economics.
- Ms. DeLucca: Remember that not all utilities are the same. It comes down to affordability for consumers, and the value they see is based on policies and programs we put in place.
- Ms. Brown: Encourages QER Task Force to keep labor engaged and at the table.

- Mr. Remly: Focus on the customer. Look at how rapidly every other aspect of life and technology is changing and focus on the future.
- Mr.Bartlett: Start with the end in mind. Focus on the service you are providing to the customer/the citizen in meeting affordability, reliability, and policy goals.

## Panel 3: Ensuring Resource Adequacy

### Panelists

- David A. Cavanaugh, Director, Regulatory & Market Affairs-ISONE, NRG Energy
- Edward Tatum, Jr., Vice President Transmission, American Municipal Power
- Craig Glazer, Vice President – Federal Government Policy, PJM
- William Berg, Vice President Wholesale Market Development, Exelon Corporation
- Lawrence Brenner, Commissioner Emeritus, Maryland Public Service Commission

### Efficacy of Capacity Markets

- The capacity markets in ISO-NE, NYISO, and PJO are functioning well and meeting resource adequacy requirements. They support continued operation of existing investment, help the efficient exit for uneconomic resources, and attract a broad mix of resources.
- Issue arises where capacity markets are indirectly impacting the fuel mix of the industry. Where energy markets are falling due to low commodity prices and policy objectives, capacity prices will rise, but not high enough to support base load resources.
- Capacity markets never worked well. Prices have been extremely volatile over the entire history of the capacity markets. PJM's most recent manifestation, capacity performance, inappropriately incorporates performance attributes that would be better addressed in the energy and ancillary service markets. These constructs may be needlessly complex; they move the industry away from competitive markets. What was once intended to be a temporary residual construct, has morphed into a primary revenue source for supply.
- The [capacity market] constructs focus on revenue enhancing strategies rather than an optimal resource mix at the lowest cost to consumers. Any energy market improvements should seek to provide the lowest overall cost to consumers.
- As the U.S. faces record low energy prices and increased penetration of renewables, we can expect to see significant pressure placed on nuclear, coal, oil and older gas units. When energy and ancillary service prices fall, capacity revenues must increase to balance the old requirements of capacity resources.

### Reliability and Affordability

- Used analogy of ship with a critical mission that is overloaded with additional baggage, making the trip less efficient and more expensive. Takeaway for QER: Focus on the mission, which is to ensure reliability and efficient markets to provide customers with electric service at just, reasonable rates. (Craig Glazer)

## Regulations and Policies

- There is a lack of clarity in regulations, given the range of actors, from state PUCs, governors, legislators, Congress, and even the Supreme Court. (Craig Glazer)

## Market Performance

- Markets are tools. Markets consider policy choices and come up with the resulting least cost generation. However, markets should not drive policy decisions. (Craig Glazer)
- Market Strengths: PJM and New England ISO have a forward view of capacity commitments and consistent performance requirements to drive efficient resource investment. (David Cavanaugh)
- Market Weaknesses/Concerns: Ensure that resources participating directly in the market and those that are accounted for through load adjustments have clear and comparable resource performance requirements. He also expressed concern that out-of-market resources and efforts to implement state policies and initiatives can undermine market fundamentals. (David Cavanaugh)
- He expressed a concern about NYISO's reliance on energy markets for performance incentives. With low energy prices and low load growth, NYISO might have a challenge in attracting new resources and retaining existing resources within the current market construct. (David Cavanaugh)
- Most states in New England have retail choice as well as a functional wholesale market. [As mentioned by Mr. Cavanaugh], we see new generation entering the market when and where needed, the growth of new technology, and the exit of inefficient generation. (William Berg)
- 5-10 Year Outlook for Industry: There are a lot of situations where the markets are not being used to accomplish the desired objectives. E.g. Wind and solar have had large growth as a result of a policy decision and then brought into the competitive wholesale market. Need to determine how to use markets to accomplish objectives. Regional power pools established to serve customer needs at the lowest possible cost, but the challenge is when the resources and loads are not optimized together. (William Berg)
- Energy markets are intended to improve the efficiency and lower the cost of dispatch, but they do not work well to determine or incent the resources that need to be built, retired, or retained. Focus should be placed on improving the functioning of these markets, reducing reliance on resource adequacy constructs, or capacity markets, and shifting to a different construct for resource adequacy and planning.
- The key to workably competitive markets lies in FERC's efforts surrounding price formation, specifically a need for better models that actually captured all the known constraints and more rigorous development of the inputs for the cost.
- Regarding market power and buyer side market power, it is exceptionally important that any true market will have a place for self-supply.

## What role, if any should fuel diversity play in considering effectiveness of markets? Should markets be structured to encourage this fuel diversity?

- Mr. Berg: If you ignore the very real policy issues, the market has promoted fuel diversity. However, there are a lot of policy objectives which seem to not be going after fuel diversity; they seem to be going after carbon. If the current wholesale market construct is not accounted for these policies will skew fuel diversity. It is important to bring together the markets and the needs of each State's customer base, to

define success and to find a way to incorporate this into the market. If success is not defined in the market, then diversity will become a greater challenge going forward.

- Mr. Cavanaugh: Given the right design and then the right incentives, resources will respond to signals.

### What is the definition of 'Base Load'?

- Mr. Cavanaugh: Base load is an evolving definition based on the situation such as time of day and where you are in the country.
- Mr. Tatum: Certain resources were designed be serve base load because the longer they are on the greater efficiencies are realized such as nuclear. However, base load is simply load. Base load generation is the generation that over the long term, can most effectively serve that base load, regardless of the generation source.

### To what extent do markets plan for uncertainty of commodity costs such as natural gas? What extent do markets plan for the future? With the advent of many new natural gas plants are we prepared to address resource adequacy in the event of market price changes?

- Mr. Glazer: Risk in a commodity price should not be layered into the capacity market. Capacity commitments have a clear commitment and obligation to the RTO to perform regardless of commodity price. Generators and developers look at the forward prices the best they can.

### From a resource adequacy and a market perspective, do you feel that we are moving in the right regulatory direction?

- Mr. Glazer: In a number of states in the Northeast you have federal regulators holding onto a market model and the States either totally going around the market model or injecting their own resources in. In some cases the States are subsidizing and in some cases they have mandated their own agenda into that model. However the grid is integrated, what one State implements impacts other States. Markets need to be administered so the market fundamentals stay in place.

### Final Comments for the QER Task Force

- Mr. Tatum: Energy markets have their place and we need to let them continue to evolve. We need to work on our models and stop relying on resource adequacy constructs.
- Mr. Berg: Markets is a broadened term and will continue to evolve.
- Mr. Cavanaugh: The industry sat still and is now moving quickly as we look at carbon policy and state initiatives. Need to find a balance to make those things happen while managing a marketplace.
- Mr. Glazer: Markets are a tool. They are not a substitute for good public policy. Going back to the ship analogy, focus on the mission and let the ship go do what it was designed to do.

## Public Comments

## Nick Clemons (paraphrase of a statement from Rep. Joseph P. Kennedy III)

- As a member of the House Energy and Commerce Committee, I focus squarely on ensuring that our electrical system provides reliable service at just and reliable rates.
- Today, New England pays the highest average electric rates in the Continental United States. Our capacity rates have skyrocketed. Our region has experienced a dramatic reduction in base load. This speaks to the larger balance this region must strike.
- How do we move toward renewable energy future in the way consumers, businesses, and communities can actually afford?
- Need collaborative regional assessment of proposals to bring more supply to our grid from natural gas to hydropower.

## Nancy Israel, Business Attorney and New England Chapter Director of Environmental Entrepreneurs

- Raised two matters--achieving our Global Warming Solution Act goals, and developing scalable, cost effective, local energy resource offshore wind.
- Through the Regional Greenhouse Gas Initiative (RGGI), we reduced carbon emissions 35% regionally, 24% due to RGGI. We have become number one in EE in MA and most of the region is in the top five or six, through money developed funded by RGGI.
- We hope RGGI will be extended to 2030 with annual cap reductions equivalent to at least two and a half percent of 2014 emissions. In the Post-Paris context, 90 countries submitted NDCs saying they are considering or committed to market-based solutions.
- Turning to the offshore wind industry, there is a huge opportunity off the MA coast to develop a clean energy local resource at cost-competitive rates. To do that, we need the kind of public-private partnership we heard mentioned today.

## Berl Hartman, founding Director of Environmental Entrepreneurs

- Many of New England's dirtiest and oldest plants are retiring, and we have an opportunity to replace them with either old fossil fuel 20 century technology or with 21st century technology that will be cleaner and cheaper.
- Gas pipelines are unnecessary because we already have adequate capacity. The resources are adequate except on a very few hours on a very few days between now and 2030, and those peak period issues could be better solved more effectively than building $8 billion worth of new pipelines.
- This project subjects ratepayers to financial risk. We already get over 50% of our electricity based on gas, and more of our heat is based on gas. So how does bringing in more natural gas make us better off in terms of resiliency and fuel diversity and security? That assumes that the price of natural gas is going to stay perpetually low.
- There are more cost effective solutions, everything from LNG brought in this year, new market reforms, CHP, offshore wind, and there are solutions on both the demand and supply side to meet those few days when we might have a peak overload.
- The environmental costs and risks are extremely high. We cannot meet our 2050 climate goal if we stick with the natural gas we have now, so bringing in 78% more gas pipelines [will not help].

- We have a thriving clean energy sector in MA that employs over 100,000 employees in EE and solar, etc. We can be more resourceful.

## Stephen Dodge, Executive Director of the New England Petroleum Council, and local office of the American Petroleum Institute

- First, natural gas is providing clean, reliable, and affordable power to residential, commercial, and industrial customers throughout the Northeast. The shift to natural gas has provided considerable environmental benefits. Hydropower, solar, and offshore and onshore wind have roles to play in the energy mix, but they are no immediate substitute for natural gas. On affordability, the supply of natural gas has driven prices down across the country.
- Second, the shift toward natural gas requires the region to support the development of more natural gas delivery capacity in the form of new pipelines. Multiple projects are in development to meet the demand between now and 2030, but opposition to development has led some public officials to attempt to delay the approval and construction of this critical infrastructure.
- Third, energy markets must evolve to ensure that fuel resources are meeting consumer needs and ensure reliability.

## Ari Pesco, Senior Fellow in Electricity Law at the Harvard Environmental Policy Initiative

- Urges DOE and EPSA to avoid framing of regulatory compact as it is called. It says, "a regulatory compact legally binds investor owned utilities and regulators into a partnership based on reciprocal obligations." The framing is confusing, historically inaccurate, and legally wrong.
- The industry is based on state law. In 1907, Wisconsin and New York passed hte first laws establishing Public Utility Commissions that regulated electric utilities. 20 years later nearly every state or most states have been in place. This is the basis for regulation. It is not a contract. It is state law.

## Ted Saunders of the Saunders Hotel Group

- Extreme weather and other damaging greenhouse gases have already impacted our company several times with severe consequences. Since 1989, our Saunders Hotel Group properties have taken comprehensive and innovative actions to reduce carbon and environmental footprints and are actively serving as a model to hotels around the U.S. and abroad where possible and financially sound.
- We must work together to avoid a wasteful, $8 billion dollar taxpayer expenditure on new pipelines in the Commonwealth, which will become stranded assets long before they have created a return on investment. Instead, we must focus on strengthening our booming renewable energy and energy efficiency programs.
- I am one of the many businesses that supports a revenue neutral carbon fee and dividend because without it, we cannot send the right signals to the marketplace and provide the necessary predictability to investors and clean tech companies.

## Chris Woodward

- Works at a firm focusing on bond investment in corporate markets and in the public markets and in this market too. Focused on the long term. We look beyond the ratings agencies and Moody's and S&P.
- One is more on the quadrennial, but primarily on where we sit on natural gas and the prospect of what is going to happen. We have LNG shipments abroad; this country is about 70 BCF a day in its consumption from electric sectors and others. We have ships that carry three a day. Or three per shipment. Those amounts impact our daily market and suggest, by their frequency, as it will grow over time, having had only several vessels make the crossing, the impact of how quickly we can go up to $8-$14 or approach that.
- The only other thing I would comment on about the quadrennial is we heard from 21 states that are mostly deregulated states. We heard a lot about preserving a market. Long-term contracts have a market just like long-term mortgages that aren't variable. You can succeed as a ratepayer. You can succeed at achieving a low cost, especially for the decarbonized capital intensive upfront high cost directions we want to go. You can achieve low costs by entering into long-term contracts.

## Amber Hewett, National Wildlife Federation

- The National Wildlife Federation is brought to this conversation out of deep rooted concern for climate change and impact on wildlife, their habitat, and communities on the coastline and those subject to extreme weather. NWF focused our advocacy efforts on our largest untapped clean energy solution which is offshore wind power.
- We have been saying for a long time in Rhode Island as they are putting five turbines in the water that it is a national victory. We need to ramp up quickly and get to scale that studies show will make offshore wind the cost competitive resource we know it can be.
- We commend action to date on so many fronts that the Federal Government and many other states have led. DOE has done so much in terms of investing and pilot projects.

## Christian Hoepener, the Executive Director for Sustainable Energy Systems in Boston, MA

- I encourage looking at distributed energy resources from two different perspectives. The first is to look at the emerging class of consumer energy devices. There is enormous potential for market dynamics to be developed. There is explosive growth of residential PV. The PV systems are very expensive, despite that we see this growth in other part of the world, and the same systems are installed for less than half, sometimes a third, of the cost people pay here in the United States. Let's say we could install the system for the same price as is done in other countries already at $1.30 per watt instead of $3-$4 per watt. Imagine the dynamic that that would unleash.
- My second point is related to the resources as well and the question is, why is it so expensive to install them here in the United States? I applaud the DOE for its efforts to cut through regulatory code standards and permitting and inspection and interconnection processes and so on. There is a lot of work being done. There is a problem which goes from local jurisdictions over regional planning, state, and the Federal level. I think the Federal Government can have a big role in trying to promote work which makes it less expensive and easier and faster and safer to install this whole emerging class of devices, not just solar, but also storage devices, electric vehicles, and infrastructure behind the meter.

## Peter Papesch; Architect, Developer, and Member of E2; Co-Chair of the Boston Society of Architect Sustainability Education Committee

- I hope that DOE will urge a substantial decrease in the use of fossil fuels including natural gas. We would like to inspire DOE with the following triple-win strategy. Architects play an important role along with developers, owners, and engineers and client users in the building sector, which consumes about 70% of all electricity produced. We in the building sector may be able to reduce plug loads our buildings but electricity production will still require energy.
- The three wins are: 1) Switch from basically expensive fossil fuels to basically free renewables. 2) The near total reduction in GHG emissions from fossil fuels to renewable energy, and 3) during the applications for new energy projects, policy change by the DOE in favor of renewables rather than fossil fuells will accelerate the public's awareness of the relationship between an economy based on free sunshine as a source of all renewable energy and our home, a healthy, sustainable planet.