0000151238

Warren Woodward
55 Ross Circle
Sedona, Arizona 86336
928 204 6434

ORIGINAL

February 12, 2014

Arizona Corporation Commission (ACC)
Docket Control Center
1200 West Washington Street
Phoenix, Arizona 85007

Re: Docket # E-00000C-11-0328

Commissioners;

Are you aware that Massachusetts' largest electric company, Northeast Utilities, recently echoed what I have been telling you for over 2 years?

In no uncertain terms, Northeast, which serves 1.3 million customers, declares that "... there is no rational basis for the implementation of AMI." [AMI is "Advanced Metering Infrastructure", the utility industry's euphemism for "smart" meters, which was the previous euphemism.]

Enclosed you will find Northeast's January 17, 2014 submission to the Massachusetts Department of Public Utilities. I urge you to read it.

Northeast exposes and debunks several major "smart" meter myths. Among Northeast's findings:

1.) There are no cost savings to be had from "smart" meters.
2.) "Smart" meters *do not* reduce outages.
3.) "Smart" meters are not "grid modernization".
4.) "Smart" meters are a cyber-security risk.
5.) Contrary to the bogus claims of "smart" meter boosters, given the choice, few ratepayers will "opt in" and ask for a "smart" meter. They have no use for one.

Salient quotes for ***1) There are no cost savings to be had from "smart" meters. –***

Page ii – "... there is ample evidence that this technology choice ["smart" meters] will be unduly costly for customers ...."

Pages 6 & 7 – "... the costs associated with AMI are currently astronomical, while the incremental benefits for customers are small in comparison."

Page 7 – "The decision to implement AMI goes against the best business judgment of the Companies and cannot be rationally cost justified in terms of a net benefit for the overall customer base that will pay for the investment over the long term."

This next is a rather lengthy quote but it makes a point I have made in the past: There is a great deal more expense involved in the "smart" grid than just replacing meters. It is very simplistic to think that there is a cost saving by getting rid of meter readers that way. Indeed, nowhere on earth has the "smart" grid resulted in lower rates for customers. I will remind you that Central Maine Power is now being audited because their $363M in promised "smart" grid savings turned into a $99M loss in short order, and that late last year Germany rejected "smart" meters based on a cost/benefit analysis done by Ernst & Young. Note also that the following list of "smart" meter related expenses does not include the immeasurable cost in damaged human and environment health that "smart" meters cause.

Pages 7 & 8 – "The implementation of AMI involves significantly more than the replacement of meters. An AMI roll-out would require either the significant enhancement or replacement of the following systems: Communications Infrastructure used to transmit communications from the meter to the Companies; Meter Data Management System used to collect, store and process interval data and enable ISO settlement; Meter Asset Systems used to store information about all meter assets; Customer Information System ("CIS") used to calculate and present bills with time varying rates ("TVR"); ISO and Load Research Systems used to interface with internal metering, CIS and ISO processes; the Outage Management System used to utilize meter-level data to support restoration efforts; and any company-owned home technology systems, e.g., usage displays and thermostats. The Companies' media and call center capabilities would also need to be enhanced to address any AMI implementation. Costs would also exist in relation to the meters, associated technologies and related systems that are currently in place and that would have to be retired before the end of their useful life."

Page 12 – "Given that the grid modernization technology sphere is a dynamic,

rapidly evolving marketplace, it is also unclear whether the incremental benefits, if any, would begin accruing to customers prior to the implemented AMI platform being rendered obsolete. In any event, the cost remains unjustified by the benefits."

Salient quotes for ***2) "Smart" meters <u>do not</u> reduce outages.*** –

Page 4 – "Meters do not reduce the number of outages ...."

Page 11 – "Customers value price and reliability above all else and the implementation of AMI serves neither of these objectives."

Salient quotes for ***3) "Smart" meters are not "grid modernization".*** –

Page ii – "Rather than furthering grid-modernization objectives, the Department's mandate to implement AMI creates an intractable obstacle to grid modernization."

Page ii – "... the objectives of grid modernization are achievable with technologies and strategies that rank substantially higher in terms of cost-effectiveness."

Page 4 - "*An Advance Metering System is not a "basic technology platform" for grid modernization and is not needed to realize "all of the benefits of grid modernization.*"" [italics in original]

Page 4 – "Meters do not reduce the number of outages; metering systems are not the only option for optimizing demand or reducing system and customer costs; and metering systems are not necessary to integrate distributed resources or to improve workforce and asset management. Therefore, it is not correct that advanced metering functionality is a "basic technology platform" that must be in place before all of the benefits of grid modernization can be fully realized ...."

In technical detail, pages 4 and 5 then go on to list numerous methods to <u>*truly*</u> modernize the grid, all without the financial fiasco of "smart" meters.

Salient quote for ***4) "Smart" meters are a cyber-security risk.*** –

Page 9 – "AMI introduces a brand new portal into the Companies' information systems, significantly increasing the cyber-security risk."

Salient quotes for ***5) Contrary to the bogus claims of "smart" meter boosters, given the choice, few ratepayers will "opt in" and ask for a "smart" meter. They have no use for one.***

Pages 10 & 11 – "... there is no evidence that customers are willing to pay for the limited incremental functionality gained through implementation of AMI. In fact, there is evidence to the contrary. For example, industry studies show that only 46 percent of customers are aware of the concept of "smart metering," and of that percentage, 33 percent associate smart metering with complaints of meter inaccuracy, higher customer bills, invasion of privacy and health concerns. In the Companies' experience, even very large customers with sophisticated energy-management capabilities prefer stabilized, fixed and/or predictable rates to assist in managing their business or personal interests rather than time varying rates. Certain customer segments, particularly the commercial and industrial sector, have significant reservations about AMI and TVR [Time Varying Rates]. Many customers have a deep aversion to technology that links them to the "grid" in a way that they perceive as an invasion of their privacy and/or detrimental to their health."

Page 11 – "Smart metering pilot programs across the country have produced similar results in terms of showing a lack of customer interest. Even the most successful residential time-of-use pricing programs have no more than 50 percent participation by the residential customer base. For example, NSTAR's Smart Energy Pilot has seen significant participant degradation relative to the initial number of customers installed. As reported to the GMWG, NSTAR Electric made 53,000 customer contacts in an attempt to enroll customers in its smart grid program; only 3,600 customers enrolled; only 2,700 customers were installed and approximately 40 percent of those 2,700 initial participants were removed or dropped out of the pilot by May 2013. PSE&G's "myPower" pricing pilot saw similar results in which 27 percent of participants were either removed or dropped out (excluding the control group)."

Similarly, here in Arizona, I have heard that Tucson Electric Power's AMI/Home Area Network pilot program was such a dismal failure that no one talks about it.

Commissioners, when are you going to wake up to the monumental fraud which is occurring? Or are you sleeping with the fraudsters?

As Northeast says – and as I have been telling you for years – "For customers who will pay the price of this system, there is no rational basis for this technology choice."

Sincerely,

Warren Woodward

Cc: Governor Jan Brewer, Attorney General Tom Horne

KEEGAN WERLIN LLP

ATTORNEYS AT LAW
265 FRANKLIN STREET
BOSTON, MASSACHUSETTS 02110-3113

(617) 951-1400

TELECOPIERS:
(617) 951-1354
(617) 951-0586

January 17, 2014

Mark D. Marini, Secretary
Department of Public Utilities
One South Station, Fifth Floor
Boston, MA 02110

Re: D.P.U. 12-76-A – Investigation into Modernization of the Electric Grid

Dear Secretary Marini:

Enclosed for filing are the Initial Comments submitted on behalf of NSTAR Electric Company ("NSTAR Electric"), and Western Massachusetts Electric Company ("WMECO")(collectively, "Northeast Utilities" or the "Companies") in response to the straw proposal issued by the Department of Public Utilities (the "Department") in relation to the modernization of the electric distribution grid in Massachusetts. Investigation by the Department of Public Utilities on its own Motion into Modernization of the Electric Grid, D.P.U. 12-76-A (December 23, 2013)("Straw Proposal"). The Straw Proposal was issued by the Department based on its review of the Massachusetts Grid Modernization Stakeholder Working Group Process: Report to the Department of Public Utilities from the Steering Committee ("Grid Modernization Report").

NSTAR Electric and WMECO were pleased to participate in the Grid Modernization Stakeholder Working Group and appreciate the opportunity to offer these Initial Comments in response to the Department's Straw Proposal. The Companies look forward to continuing to actively participate in the on-going grid modernization proceedings.

Thank you for your attention to this matter.

Sincerely,

Danielle C. Winter

Danielle C. Winter

Enclosures

cc: Alison Lackey, Esq., Hearing Officer
Benjamin Davis, Director, Electric Power Division

COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF PUBLIC UTILITIES

Investigation by the Department of Public Utilities on its own Motion into Modernization of the Electric Grid	D.P.U. 12-76-A

INITIAL COMMENTS OF NORTHEAST UTILITIES

EXECUTIVE SUMMARY

NSTAR Electric Company ("NSTAR Electric") and Western Massachusetts Electric Company ("WMECO") (collectively, "Northeast Utilities" or the "Companies") are committed to the cost-effective modernization of the electric distribution grid with focus on four specific objectives designated by the Department of Public Utilities ("Department"): (1) to reduce the effects of outages; (2) to optimize demand, including reducing system and customer costs; (3) to integrate distributed resources; and (4) to improve workforce and asset management. These four objectives are beneficial to customers in today's operating environment. With certain modifications, the Department's Grid Modernization Straw Proposal represents a viable starting point for achievement of these objectives and the Companies' look forward to further proceedings in this docket to advance those elements.

The principle outcome of the Straw Proposal, however, is a mandate for the Companies to initiate the accelerated implementation of a particular technology choice, Advanced Metering Infrastructure ("AMI"). The Department's decision to mandate AMI comes without due consideration of key issues such as the immense cost attached to the technology choice; whether customers are willing and able to pay the price of this technology choice; whether the functionality provided by the technology choice will be utilized by customers or is even sought by customers; whether the imposition of significant costs on distribution customers for this

technology conflicts with other policies encouraging bypass of the distribution system through increased penetration of distributed resources; whether investment in distribution upgrades needed to accommodate distributed energy resources is a better investment of customer dollars given the relatively small incremental benefit afforded by AMI; and whether other issues such as market alternatives, time-varying rates, and cyber-security should be resolved *before* there can be any rational determination that this technology is a good choice for customers. The technology choice is made although there is no evidence that this is a good choice for customers. Conversely, there is ample evidence that this technology choice will be unduly costly for customers and that the objectives of grid modernization are achievable with technologies and strategies that rank substantially higher in terms of cost-effectiveness. For customers who will pay the price of this system, there is no rational basis for this technology choice.

Rather than furthering grid-modernization objectives, the Department's mandate to implement AMI creates an intractable obstacle to grid modernization. The mandate precludes NSTAR Electric and WMECO from designing and implementing grid modernization plans that are best suited to customers and that mitigate the cost that customers will bear for progress. The Straw Proposal also denies the option of targeted cost recovery for any grid modernization initiatives other than AMI. In order to support the accelerated implementation of grid-modernization plans, the Companies require targeted cost recovery to engage in the installation of technologies beyond what can be accommodated by current levels of capital investment fully dedicated to more traditional safety and reliability objectives.

The Department should adopt the Companies' recommendations set forth below. The recommendations will achieve the four objectives of grid modernization in a manner that is cost-effective for customers. There should be no other result for this proceeding.

COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF PUBLIC UTILITIES

Investigation by the Department of Public Utilities on its own Motion into Modernization of the Electric Grid	)	D.P.U. 12-76-A

INITIAL COMMENTS OF NORTHEAST UTILITIES

I. Introduction

These initial comments are submitted on behalf of NSTAR Electric and WMECO in response to the straw proposal issued by the Department in relation to the modernization of the electric distribution grid in Massachusetts. Investigation by the Department of Public Utilities on its own Motion into Modernization of the Electric Grid, D.P.U. 12-76-A (December 23, 2013) (hereinafter "Straw Proposal"). The Straw Proposal was developed by the Department on the basis of the Massachusetts Grid Modernization Stakeholder Working Group Process: Report to the Department of Public Utilities from the Steering Committee ("Grid Modernization Report").[1]

Northeast Utilities supports the Department's efforts to address the important issue of grid modernization and generally views the Straw Proposal as a viable start in balancing the range of competing interests brought forth in the Grid Modernization Working Group

[1] On October 2, 2012, the Department issued its Investigation by the Department of Public Utilities on its own Motion into Modernization of the Electric Grid, D.P.U. 12-76 (the "Notice of Investigation"), commencing an investigation into the modernization of the electric distribution grid. The Department subsequently convened the Grid Modernization Working Group, comprised of the Massachusetts Distribution Companies, the Department of Energy Resources ("DOER"), the Office of the Attorney General ("Attorney General"), the New England Independent System Operator ("ISO-NE") and other stakeholders. NSTAR Electric and WMECO were active participants on the GMWG Steering Committee and other committees and participated in the preparation of the Grid Modernization Report. Northeast Utilities submitted written comments on the Grid Modernization Report on July 24, 2013.

("GMWG"). In the Straw Proposal, the Department identifies four grid-modernization objectives, which are to: (1) reduce the effects of outages; (2) optimize demand, including reducing system and customer costs; (3) integrate distributed resources; and (4) improve workforce and asset management. D.P.U. 12-76-A at 3. All four of these objectives are valid, reasonable and appropriate in light of today's operating environment. In these comments, Northeast Utilities offers certain recommendations as a means to better align the Straw Proposal with the interests of customers, who are the intended beneficiaries of the grid-modernization objectives.

As an initial note, significant time and resources were expended in the GMWG reviewing the costs and benefits of AMI. This dialogue established that there are a host of critical issues to be addressed before it will be possible to determine whether AMI is appropriate for implementation by the Companies, including evaluation of the impact of its sizeable cost and lack of attendant benefits. The six-month technical review conducted off the record for this proceeding cannot be duplicated here in 25 pages. However, there is no rational basis for the implementation of AMI. Among many other considerations, achievement of the Department's four grid-modernization objectives does not require the implementation of AMI, despite the Department's suggestion that it does. Therefore, the Companies' comments below recommend that the Department modify the Straw Proposal to eliminate the requirement to implement AMI as part of the required Grid Modification Plans ("GMPs"), along with a few other changes.

II. Analysis and Recommendations for the Straw Proposal

A. Overall Approach

The Department's decision identifies the goals and objectives of a modern electric grid, while expressly delineating that investment decisions relating to system planning and the

implementation of new technologies will remain within the responsibility of the electric companies. D.P.U. 12-76-A at 10, 12. This construct is vital because it will allow NSTAR Electric and WMECO to develop and implement GMPs that will benefit customers, while leveraging investments in technology previously made to modernize the distribution system. Allowing design flexibility will enable the Companies to deploy resources optimally; to develop and implement GMPs that encompass a workable strategy for achieving measurable progress in relation to the Department's four, overarching grid-modernization objectives; and to meet the core obligation to provide safe and reliable service at a reasonable cost. The flexibility to develop a company-specific plan based on company-specific circumstances is an element of the Department's Straw Proposal, which should not be changed or diminished in the final result.

B. Comprehensive Advanced Metering Plans

1. Advanced Metering Functionality

The Straw Proposal requires NSTAR Electric and WMECO to include a CAMP in the first GMP submitted to the Department following the issuance of a final decision in the Grid Modernization proceedings.[2] D.P.U. 12-76-A at 3, 18. The Straw Proposal further specifies a list of seven advanced metering functionalities that must be included in the CAMP. Id. at 11-12. In explaining its decision to require electric companies to develop and submit a CAMP, the Department asserts that advanced metering functionality is a "basic technology platform for grid modernization that *must be in place* before all of the benefits of grid modernization can be fully realized." Id. at 12 (emphasis added). In addition, the Department asserts that electric companies will make "individual choices about technology and systems, *but must meet the objectives and requirements*." Id. (emphasis added). The Department further directs that the

[2] The Straw Proposal directs that the CAMP should consist of: (1) a technology proposal and implementation plan; (2) a business case with a benefit-cost analysis; (3) a request for pre-authorization of investments; and (4) a request for a mechanism to allow for more timely cost recovery than is typically available. Id. at 18.

CAMP submitted by each electric company should be designed to achieve the designated advanced metering functionality within three years of the plan's approval.[3] Id. Together, these predicates and associated directives, along with other requirements contained in the Straw Proposal, have the effect of mandating the accelerated implementation of AMI on the faulty basis that the benefits of grid modernization cannot be achieved without its implementation. This outcome is flawed and therefore undermines the integrity of the Straw Proposal.

An Advance Metering System is not a "basic technology platform" for grid modernization and is not needed to realize "all of the benefits of grid modernization." The Department identified four objectives for grid modernization, all of which can be achieved without the implementation of an advanced metering system. Meters do not reduce the number of outages; metering systems are not the only option for optimizing demand or reducing system and customer costs; and metering systems are not necessary to integrate distributed resources or to improve workforce and asset management. Therefore, it is not correct that advanced metering functionality is a "basic technology platform" that must be in place before all of the benefits of grid modernization can be fully realized, as the Department suggests. Id. at 12.

In fact, there are non-metering technologies that the Companies have implemented, or can implement in the future within a grid-modernization plan, that would tangibly advance the grid-modernization objectives set by the Department. For example, utilizing SCADA-enabled smart switches will both reduce outages and mitigate the effects that outages have on customers. Substation monitoring, remote controls and microprocessor relays can mitigate the impact of widespread outages; manage load constraints; and help to optimize the use of assets in real time. As a means to optimize demand, the installation of automated capacitor banks increases system

[3] The Department states that it will consider proposals to implement advanced metering functionality over a longer term so long as an alternative timeline is provided.

efficiency and reduces costs. Direct control of load or generation can be employed to manage system peaks. In order to allow for the integration of distributed resources, sensors and systems for advanced load flow models that allow for more distributed resources on a circuit can be installed. As for improving workforce and asset management, next generation mapping and outage management systems increase the efficiency of response to outages, while communications, sensors and systems provide system level situational awareness and enhanced safety. Therefore, it is clear that the Companies would be able to identify and implement a suite of non-meter technologies and processes, in addition to those already implemented, in order to advance the Department's grid-modernization objectives *without* the implementation of an advanced metering system.

There is also an important dynamic involved in relation to the integration of widespread distributed energy resources to the electric power grid. Industry study conducted by entities such as the Electric Power Research Institute shows that the electric distribution grid will require substantial investment to be positioned for the integration of distributed energy resources.[4] Therefore, grid-modernization efforts have to be closely coordinated with policies that are encouraging the growth of distributed energy resources. Finite capital resources available for grid modernization should be aimed at this integration effort before any additional monies are expended on metering capabilities that provide limited and/or speculative incremental benefits over current metering technology (following many years of investment in those systems).[5] Moreover, the growth of distributed generation and current subsidies results in the *bypass* of the electric distribution system by potential electric customers leaving fewer and fewer customers to

---

[4] *Value of an Integrated Grid: Utilizing Utility-Scale and Distributed Energy Resources*, at 1 (January 6, 2014).

[5] NSTAR Electric and WMECO have deployed Automated Meter Reading ("AMR") drive-by meter reading capabilities deployed throughout their service territories.

pay for it. This creates a pricing crisis in practical terms for both residential and business customers remaining on the system. Huge additional investments to the distribution system will only have the effect of exacerbating the issue for customers.

Accordingly, not only is there a flaw in the Department's premise that an advanced metering system is a "basic technology platform" for grid modernization, but also the implementation of a costly, advanced metering system is at odds with policies designed to promote the growth of distributed energy resources. In directing the implementation of AMI, the Department's Straw Proposal does not address or consider this juxtaposition to any degree. However, immense, near-term investments in advanced metering systems should not be mandated without (1) methodical, valid analysis of the associated costs and benefits; and (2) the development of a plan to solve the detrimental impact of cost-shifting driven by the pervasive installation of distributed energy resources.

There Is No Rational Basis for Department-Mandated Implementation of AMI. The Straw Proposal is structured so that, given current technology alternatives, AMI is the only strategy that will satisfy all seven of the advanced metering functionalities required of the CAMP. Two criteria in particular dictate the implementation of AMI to satisfy the complete set of funtionalities. Specifically, it is impossible to collect customer interval data in near real-time (i.e. hourly), which could also be usable for settlement in the ISO-NE energy and ancillary service markets, absent the implementation of AMI. The same is true for the required functionality that enables two-way communication between customers and the Companies.[6] Throughout the GMWG, Northeast Utilities consistently raised the concern that the costs associated with AMI are currently astronomical, while the incremental benefits for customers are

[6] Two-way communication is feasible on an opt-in basis. From a practical perspective, to deliver the service to all customers on an opt-out basis, the Companies would need to deploy an AMI communications infrastructure.

small in comparison. The Companies will not repeat all of the dialogue that has occurred here due to space constraints; however, the ultimate conclusion has not changed. There are better technologies in which to invest customer funds for the achievement of grid-modernization objectives. The decision to implement AMI goes against the best business judgment of the Companies and cannot be rationally cost justified in terms of a net benefit for the overall customer base that will pay for the investment over the long term. Some of the significant concerns left unaddressed by the Department in the Straw Proposal include the following:

First, the mandated implementation of AMI is not a prerogative within the Department's discretion. The specification of particular technologies or technological platforms is an issue within the management judgment of the Companies and which would only be undertaken on the basis of all relevant investigation and analysis. For this reason alone, mandated AMI implementation is not the correct manner in which to advance the Department's identified grid modernization objectives. Rather than a rush to judgment, the Department should carry through with the acknowledgment that flexibility at this stage is advisable and that the Companies should be allowed to design their GMPs in a manner that provides cost-effective benefits to customers with the seven functionalities serving as long-term guidelines rather than short-term mandates.

Second, the Department has not given any credence to the concern raised in the GMWG that the implementation of AMI is a costly undertaking at this time and there is no cost justification that can support the implementation of AMI. As identified by Northeast Utilities throughout the GMWG process, an AMI roll-out is problematic due to the extraordinary cost associated with, at best, a modest increase in functionality. The implementation of AMI involves significantly more than the replacement of meters. An AMI roll-out would require either the significant enhancement or replacement of the following systems: Communications

Infrastructure used to transmit communications from the meter to the Companies; Meter Data Management System used to collect, store and process interval data and enable ISO settlement; Meter Asset Systems used to store information about all meter assets; Customer Information System ("CIS") used to calculate and present bills with time varying rates ("TVR");[7] ISO and Load Research Systems used to interface with internal metering, CIS and ISO processes; the Outage Management System used to utilize meter-level data to support restoration efforts; and any company-owned home technology systems, e.g., usage displays and thermostats. The Companies' media and call center capabilities would also need to be enhanced to address any AMI implementation. Costs would also exist in relation to the meters, associated technologies and related systems that are currently in place and that would have to be retired before the end of their useful life. Northeast Utilities estimates, conservatively, that the price tag for an AMI roll-out, including the recovery of existing investment on the Companies' books would likely approach, and possibly exceed, $1 billion over the course of the CAMP implementation – all of which is to be borne by customers *who may or may not be interested in interacting with the distribution system at the level implicated by AMI technology.*

Third, even if there is any chance that the cost of implementing AMI can be justified, it cannot be justified without resolution of the Department's investigation into TVR and other issues tied to the cost-benefit analysis. The Department may believe that it can work through the TVR investigation quickly to expedite the development of cost-benefit analyses in time for mid-year filings of the GMPs. However, TVR is a complex concept worthy of in-depth analysis and consideration. A key consideration is whether or not the supply component would be subject to TVR, considering this part of the business is unregulated. If not, it is questionable as to how

[7] TVRs can include time-of-use rates, critical peak pricing, peak-time rebates, and real time pricing. D.P.U. 12-76-A, at 34.

effective TVR would be if it only affects half of a customer's electric bill. The development of a company-specific TVR proposal, including but not limited to the type and design of a TVR mechanism that best achieves grid-modernization objectives; which rate classes would be affected; whether TVR would be mandatory and, if so, for which rate classes; and how best to educate customers as to the opportunities and mechanics of the proposed TVR mechanism, are issues that are critical to the development of a TVR proposal that will take time to evaluate, present and decide. Without the Department's final determinations regarding TVR, the Companies cannot begin to develop a valid cost-benefit analysis for the required CAMPs.

Similarly, without resolution of the Department's investigation into cyber-security, it is not possible for the Companies to develop a suitable CAMP. AMI introduces a brand new portal into the Companies' information systems, significantly increasing the cyber-security risk. Currently, the only mandatory standard for electric distribution company cyber-security is the North American Electric Reliability Corporation Critical Infrastructure Protection ("NERC-CIP"), which applies only to bulk power systems and not to the electric distribution systems and metering infrastructure subject to the Department's jurisdiction.[8] D.P.U. 12-76-A at 35-36. In its investigation into cyber-security, the Department stated that it intends to explore whether or not to use existing standards to assess the Companies' cyber-security practices and, if warranted, could expand the investigation to broader cyber-security planning and risk management. Id. It is reasonable to assume that such an investigation could lead to the implementation of a series of cyber-security planning and risk management mandates. Implementation of these mandates

[8] There are voluntary cybersecurity recommendations and guidelines for electric distribution companies including: (1) the National Institute of Standards and Technology ("NIST") Interagency Report ("NISTIR") 7628, entitled, "Guidelines for Smart Grid Cyber Security;" (2) the United States Department of Energy's "Risk Management Process;" and (3) the Electricity Subsector Cyber Security Capability Maturity Model ("ES-C2M2"). Id. at 36. Additionally, NIST is developing a critical infrastructure security framework in response to the President's executive order on cybersecurity. Id.

would necessarily involve significant costs as they would affect all aspects of the Companies' distribution systems and related IT systems. These costs must be incorporated into the cost-benefit analysis for AMI.

It is also premature to assume that AMI can provide for large-scale conservation voltage reduction ("CVR"). D.P.U. 12-76-A at 11. Unlike many other grid modernization technologies and processes, CVR was not extensively discussed or analyzed during the course of the GMWG. CVR is an intricate and potentially problematic issue that affects, in addition to meters, numerous aspects of a distribution system warranting far more investigation than is contemplated under the Straw Proposal. To date, no major utility in the United States has implemented a large-scale CVR program, nor has such a program been introduced in Massachusetts to enable the Companies to gain either direct or indirect experience with such an initiative. The requirement to include a large-scale deployment in the CAMP without allowing for the proper investigation to determine the appropriateness of such a program is arbitrary and, most likely, will result in the expenditure of significant funds by customers for, at best, minimal benefits. Rather than the premature requirement of CVR, the Department should allow the Companies to exercise their expertise to evaluate CVR to determine if it is appropriate for implementation.

Fourth, there is no evidence that customers are willing to pay for the limited incremental functionality gained through implementation of AMI. In fact, there is evidence to the contrary. For example, industry studies show that only 46 percent of customers are aware of the concept of "smart metering," and of that percentage, 33 percent associate smart metering with complaints of meter inaccuracy, higher customer bills, invasion of privacy and health concerns. In the Companies' experience, even very large customers with sophisticated energy-management capabilities prefer *stabilized, fixed and/or predictable rates* to assist in managing their business

or personal interests rather than time varying rates. Certain customer segments, particularly the commercial and industrial sector, have significant reservations about AMI and TVR. Many customers have a deep aversion to technology that links them to the "grid" in a way that they perceive as an invasion of their privacy and/or detrimental to their health.

In addition to concerns about customer interest, the Department is requiring the implementation of costly infrastructure that would have to be paid for at the very same time that the Department's policies seek to allow customer exits from the distribution system to take advantage of distributed energy resources. No analysis of this dynamic has been undertaken; nor has any quantification whatsoever of customer bill impacts. Customers value price and reliability above all else and the implementation of AMI serves neither of these objectives.

Moreover, the Department should also consider the results and experiences of recent and ongoing pilots before blindly moving forward with an AMI mandate. Smart metering pilot programs across the country have produced similar results in terms of showing a lack of customer interest. Even the most successful residential time-of-use pricing programs have no more than 50 percent participation by the residential customer base. For example, NSTAR's Smart Energy Pilot has seen significant participant degradation relative to the initial number of customers installed. As reported to the GMWG, NSTAR Electric made 53,000 customer contacts in an attempt to enroll customers in its smart grid program; only 3,600 customers enrolled; only 2,700 customers were installed and approximately 40 percent of those 2,700 initial participants were removed or dropped out of the pilot by May 2013. PSE&G's "myPower" pricing pilot saw similar results in which 27 percent of participants were either removed or dropped out (excluding the control group). Roll-outs of AMI require careful consideration of the different implementation challenges, including customer perception about bills, security and

health-related issues. Market research will help to assess what functionalities are important to the different customer classes and whether or not those customers will view the achieved functionalities as worthy of the anticipated costs. Given the level of expenditures associated with AMI, it is prudent for the Companies to determine what the market will bear prior to designing their CAMPs. Failure to do so could result in decreased customer interest in grid modernization and other negative impacts. The success of the Companies' GMPs relies heavily on the participation of those who will ultimately bear the costs of those efforts.

Fifth, in mandating AMI, the Department has failed to consider the role that competitive markets should play in grid modernization and the costs that competitive market providers and other market participants have already invested in grid modernization efforts. For instance, home energy automation solutions like smart thermostats and appliances are advancing at a rapid pace and, in many cases, are leverage existing communications infrastructure such as broadband the internet. Rather than duplicating these expenditures and predetermining that the preferred communication should be enabled through the ill-considered implementation of AMI, the Companies should be afforded the flexibility to design GMPs that leverage the expenditures for the benefit, not to the detriment, of customers.

Last, but not least, there is little confidence that the incremental benefits of moving to an AMI platform will be sufficient to warrant the cost. Customers have already supported the investment associated with the installation of AMR metering technology and the incremental benefit afforded by AMI arises from the communications element, not from the metering element. Operational savings were realized with the implementation of AMR and are not further available with the implementation of AMI. This means that the incremental benefit of AMI is largely limited to the communications element, which can be addressed in other ways without

incurring the cost of the meter. Given that the grid modernization technology sphere is a dynamic, rapidly evolving marketplace, it is also unclear whether the incremental benefits, if any, would begin accruing to customers prior to the implemented AMI platform being rendered obsolete. In any event, the cost remains unjustified by the benefits.

Recommendation: The Companies recommend that the Department modify its mandate regarding implementation of the CAMP to establish the seven functionalities as optional, long-term guidelines for CAMPs, rather than required elements. In addition, the Department should reaffirm that electric companies retain the discretion to structure GMPs to incorporate components identified by the Companies as furthering the four grid-modernization objectives, subject to the approval of the Department. This flexibility will allow the Companies to design GMPs that are cost-effective, beneficial and assist in the continued modernization of the grid thus enabling the Companies to continue to provide safe and reliable service to customers.

2. CAMP Cost-Benefit Analysis

The Straw Proposal requires CAMPs to include a cost-benefit analysis using the business case approach, assessing all costs and benefits, including those that are difficult to quantify, as advocated by the Clean Energy Caucus in the Grid Modernization Report. Id. at 20; Grid Modernization Report at 82. Before it pre-authorizes the CAMP, the Department must find that the benefits, quantified and un-quantified, exceed the costs. D.P.U. 12-76-A at 20. However, the Department states that the Companies should not include any costs incurred for existing meters and associated systems in the CAMP cost-benefit analysis, which would be retired from service prior to the end of their useful lives pursuant to the CAMP. Id. Under the Straw Proposal, the Companies are required to base their CAMP cost estimates on various sources, including vendor quotes. Id.

Earlier in these comments, Northeast Utilities described the need to understand the costs and benefits associated with any mandates resulting from the separate TVR and cyber-security investigations. Additionally, it is necessary to have as much precision and specificity as practicable regarding the quantification of benefits associated with the CAMP, especially since the Department, in subsequent cost recovery proceedings, will evaluate the CAMP expenditures in light of the projections in the cost-benefit analysis. Id. at 21. The Companies understand the Department's position regarding the desire to include un-quantified benefits in the CAMP analysis to ensure robust CAMPs designed to help achieve the Department's grid modernization objectives. However, given that the Companies' ability to recover costs will be based in part on comparison to the original cost-benefit analysis, it is critical to quantify as many of the benefits as is practicable in order to avoid reliance on skewed cost-benefit analyses results and the potential for disallowance of cost recovery in subsequent proceedings. Failure to do this could lead to conservative CAMPs to minimize the risk of the disallowance of otherwise prudently incurred costs based on an overgenerous inclusion of un-quantified benefits in the initial CAMP cost-benefit analysis.

Furthermore, in ascribing a weight to un-quantified benefits, it is important to consider the time period over which the CAMP benefits are anticipated to accrue. Given that the Straw Proposal requires each GMP to cover a 10-year period and be updated in the Companies' base distribution rate cases, which must occur no less often than every five years pursuant to G.L. c. 164 §94, benefits that will not accrue until well in the future may not be appropriate for inclusion in the cost-benefit analysis given the likelihood a updating the CAMP due to changing technologies, processes and other related issues.

The Straw Proposal also requires the Companies to include projections about electricity and peak-load savings from the implementation of TVR, along with the underlying assumptions, in the CAMP cost-benefit analysis. Id., at 34. In recognition of the complexities involved with developing TVRs, the Department will open a separate investigation into TVRs in the near future to examine the optimal approach to rate design. Id. Northeast Utilities supports the Department's plan to conduct a separate investigation into TVRs and looks forward to actively participating in that investigation. The Companies agree that TVR is a complex concept worthy of in-depth analysis and consideration (see above). In the event that the Department chooses not to accept the Companies' recommendation that the Companies' develop their GMPs and CAMPs following the conclusion of the TVR investigation, the Companies believe that it is premature to include any projections of TVR-induced electricity and peak-load savings in the CAMP cost-benefit analysis prior to the conclusion of the investigation. Such projections would have to be based almost entirely on assumptions, as opposed to measureable facts, rendering them questionable, at best. As noted above, given that future cost recovery is based, in part, on a comparison to the CAMP cost-benefit analysis, any TVR savings projections would likely be very conservative which would tend to skew the results of the cost-benefit analysis. It is more appropriate to forego inclusion of TVR savings in the cost-benefit analysis and rely, in the future, on TVR savings projections that are grounded in experience following the conclusion of the separate TVR investigation, and the Companies' determination of the most appropriate TVR to implement in their respective service territories.

As for the costs to be included in the cost-benefit analysis associated with the CAMPs, it is necessary for the Companies to retain the discretion to select technically qualified vendors from whom the Companies' would seek cost information. Given that future cost recovery of

CAMP expenditures rests, in part, on comparison to the original CAMP cost-benefit analysis, it is critical to only include reliable cost estimates from vendors. Given their relationships with vendors, the Companies are best suited to determine which vendors' cost estimates are to be included in the CAMP cost-benefit analysis.

Lastly, Northeast Utilities strongly disagrees with the Department's determination that the costs associated with any meters and associated systems, such as those enumerated above, that are retired prior to the end of their useful life under the CAMP should not be accounted for in the CAMP cost-benefit analysis. The costs that currently exist on the Companies' books in relation to existing meter plant support existing functionality. The implementation of AMI infrastructure will duplicate this functionality to some, perhaps a significant, extent. Therefore, if the costs existing on a company's books are excluded from the cost-benefit analysis, then the benefit of functionality that is duplicated by AMI infrastructure must also be excluded or the result is a double-counting of benefits. In order to ensure that the Companies are implementing CAMPs where the costs are justified by the benefits (see D.P.U. 12-76-A at 3, 20), all associated costs must be included in the analysis or duplicative benefits must be eliminated from the analysis. Otherwise, the cost-benefit results will be skewed eliminating a rational basis for the investment decision.

Additional study and analysis is needed to assure that there is a solid business case for this colossal investment; yet, the Department is mandating implementation *within three years*, unless an exception is approved. The Department has indicated that it will undertake separate TVR and cyber-security investigations to resolve issues implicated in the implementation of AMI infrastructure; however, these aspects represent only part of the analytical foundation that

would be needed to support this investment decision. Any cost-benefit analysis, developed on the short timeline envisioned by the Straw Proposal, would be seriously deficient.

In addition, Northeast Utilities respectfully requests that the Department's pre-authorization of the Companies' CAMPs, discussed in greater detail below, also constitutes an endorsement of the Companies' decision to retire the meters and associated systems and obviates the need for further review of the Companies' decision in future cost recovery proceedings. The Companies acknowledge that they would bear the burden of demonstrating that the costs associated with the removal were prudently incurred.

C. Cost Recovery

During discussions with the GMWG, Northeast Utilities made it clear that cost recovery would need to be aligned with the objectives of the GMP in order to allow for its implementation, including the installation of technologies that would not otherwise be undertaken without the GMP, or would be undertaken on a time frame different from the timeframes laid out by the Department for the GMP. The Straw Proposal provides that the Companies may request implementation of a capital expenditure tracking mechanism for their proposed CAMP expenditures; however, the cost-recovery opportunity appears to be directly contingent upon the implementation of AMI. D.P.U. 12-76-A at 18. In allowing for this cost-recovery, the Department stated that it was seeking to remove perceived impediments to grid modernization. Id. However, because the Department has linked its cost-recovery option to the implementation of AMI, the Department has in effect created a recovery mechanism for the most expensive grid-modernization technology with the least certain benefits, without any evidence to support that this is the appropriate end-state for the Companies' distribution systems and

customers. The availability of a cost-recovery mechanism for a system that is unwarranted by a business case is not removing any impediments to grid-modernization efforts.

If the Department is truly seeking to accelerate the deployment of cutting-edge grid modernization technologies to achieve the delineated grid-modernization objectives and functionalities in the near term rather than through a traditional capital investment plan cycle, the Department must allow for implementation of a cost-recovery mechanism outside of the traditional rate case arena. Restricting the bulk of grid modernization efforts to traditional ratemaking treatment will limit the scope and breadth of the Companies' GMPs, where targeted cost recovery for these efforts would, instead, foster innovation and lead to more robust GMPs aimed towards more fully achieving the Department's delineated grid modernization objectives. Without targeted cost recovery, the grid-modernization initiatives contained in the Companies' GMPs will be forced to compete for funds with more traditional capital investments necessary to maintain the safety and reliability of the Companies' distribution systems. There is a finite pool of funds for capital projects and efforts such as vegetation management and system hardening[9] which provide a more immediate improvement to reliability and safety may be prioritized ahead of grid modernization initiatives whose benefits accrue over the longer term. In order to avoid this constraint on GMPs, the Department must extend targeted cost recovery to the grid-modernization initiatives contained in the Companies' GMPs, conditioned on the Companies' adherence to any mandated targeted cost recovery mechanism elements.

Regarding the form and required elements of the targeted cost recovery mechanism, specifically the requirement that the Companies bear the burden of demonstrating that all of the costs they seek to recover through their capital expenditure tracking mechanisms are incremental

[9] The Straw Proposal states that, while vegetation management and system hardening may improve reliability and prevent outages, these types of initiatives are not grid-modernization functionalities. D.P.U. 12-76-A at 10.

to those recovered in base rates, Northeast Utilities supports the use of the incremental test utilized by Bay State Gas Company d/b/a Columbia Gas of Massachusetts ("Bay State") in its targeted infrastructure recovery factor ("TIRF").

D. Pre-Authorization

In the Straw Proposal, the Department states that, if it approves the CAMP, its pre-authorization "endorses" the Companies' decision to proceed with the investment plan. D.P.U. 12-76-A at 18. The Department states further that the pre-authorization of the CAMP obviates the need for "further review of the Companies' decision or timeline for making the CAMP investments in subsequent cost recovery proceedings, although the Companies must still demonstrate to the Department's satisfaction that the CAMP investments are used and useful and that CAMP costs were prudently incurred. Id. at 18-19.

Northeast Utilities supports the direction that the Department has taken in relation to the CAMP preauthorization and the Department's "endorsement" prior to the expenditure of funds and the commitment of resources. The Companies understand this to mean that, following the pre-approval, there will be no subsequent second-guessing as to whether it was reasonable and prudent for the Company to implement the CAMP, while appropriately requiring an after-the-fact demonstration that the actual CAMP expenditures were reasonable in terms of prudent management of construction costs. However, two concerns are raised by this paradigm. First, the Department cannot leave open the determination as to whether the investments are "useful" to customers. Because technologies for grid modernization are evolving quickly and the Department is pushing the electric companies to implement cutting edge technologies on an accelerated basis, the "usefulness" of investments may be called into question after the fact, even though an electric company is executing its Department-approved GMP. Whether investments

are actually in service is a threshold that can only be met after installation and is appropriately deferred to a cost-recovery proceeding, where costs will be reviewed for reasonableness. Second, the Department must extend this treatment to all elements of the GMPs (not just the CAMP) so that the Department's approval of the GMP eliminates the need for further review of the Companies' decisions or timeline for making the GMP investments in any subsequent GMP-related cost-recovery proceeding. Without these two changes, the Companies would be forced to expend funds and commit resources based on a Department approval that might not withstand the test of time.

E. Grid Modernization Metrics

In order to evaluate the Distribution Companies' implementation of their respective GMPs and CAMPs and progress towards the Department's identified grid modernization objectives, the Department intends to develop company-specific implementation metrics and a standard set of targeted, statewide performance metrics for GMPs. Id. at 29. At this time, the purpose of the metrics will be to record and report relevant information without a determination of whether it may be appropriate to connect such metrics to financial penalties and rewards in the future. Id. Under the Straw Proposal, each electric company must include: (1) infrastructure metrics that track its implementation of grid modernization technologies or systems; and (2) performance metrics that measure progress towards the objectives of grid modernization. Id. at 29-30.

Northeast Utilities is supportive of performance-based metrics within the context of the GMPs as a means of providing information regarding progress towards grid modernization objectives. The Companies emphasize that these performance-based metrics must be based on grid modernization functions completely under their control and that the Companies'

performance under the metrics is measured using quantitative and objective, rather than subjective, criteria. It is important that valid performance indicators are created and a discernible correlation between Company efforts and progress towards grid modernization objectives is established. This principle will enable an equitable review of the Companies' progress and will provide a solid basis for determining whether modifications should be made to the GMPs.

F. Separate TVR Investigation

As noted above, the outcome of the TVR investigation is inextricably intertwined with the design of the GMPs and CAMPs. Given this and the Companies' need to develop and implement grid modernization initiatives that are designed to achieve the Department's identified grid modernization objectives, the Companies respectfully request that the Department initiate the separate TVR investigation and allow the Distribution Companies to apply the guidance and benefits of that investigation to their initial GMPs, including CAMPs.

G. Cyber-security

The Department also intends to explore, in the context of grid modernization, issues related to cyber-security, privacy, and access to meter data in a separate proceeding. D.P.U. 12-76-A at 4. The Straw Proposal requires all GMPs to describe the Distribution Companies' strategies for ensuring cyber-security, privacy, and safeguards in the sharing of meter data in conjunction with their grid modernization activities. Id. at 31. The Companies are supportive of the Department's determination to address cyber-security, privacy, and access to meter data in a separate proceeding and look forward to actively participating in that proceeding. As noted above, it is critical for the Companies to know the outcome of that investigation and to apply any directives to their GMPs and CAMPs. Northeast Utilities also stresses the critical nature a safeguarding this information and cautions against wide public dissemination of NSTAR Electric and WMECO's specific proposals to ensure that their respective electric distribution systems and related systems are safe from cyber-

attacks. Although the Companies acknowledge that it is important for the Department to be apprised of their plans and procedures, public dissemination of this information weakens the Companies' ability to safeguard their systems and customer information.

H. Research and Development

In its efforts to ensure continued grid modernization and the adoption of new grid modernization technologies, the Department requires the Distribution Companies to provide information about their current research and development ("R&D") activities. Id. at 32. Both NSTAR Electric and WMECO have developed robust and beneficial relationships with vendors, academic institutions and research entities to ensure that they are continually apprised of new or improved technologies and processes, including grid modernization technologies and processes, which enable the Companies to continue to provide safe and reliable service to their customers. By leveraging these relationships, the Companies gain the benefit of the vendors' and institutions' expertise and experience with both emerging and newly developed technologies and processes that, in turn, enables NSTAR Electric and WMECO to make informed decisions about which processes and technologies are best suited for short and longer-term safety and reliability needs. Although Northeast Utilities believes that its approach to R&D is the currently the most appropriate method, if the Department were to require the Companies to conduct grid modernization technology R&D in furtherance of grid modernization objectives, then recovery of any R&D costs would be appropriate for recovery from customers.

III. Conclusion

NSTAR Electric and WMECO are committed to fulfilling their obligation to provide safe and reliable service for their customers. Further enhancing the resiliency and safety of the distribution system through grid modernization is an important and complex issue. The

Companies appreciate the opportunity to comment on the Department's Straw Proposal and look forward to continuing to actively participating in the on-going grid modernization proceeding.

Appendix A

Specific Questions from the Department

1. Has the Department provided the correct directives to electric distribution companies on grid objectives?

In the Straw Proposal, the Department identifies four grid-modernization objectives, which are to: (1) reduce the effects of outages; (2) optimize demand, including reducing system and customer costs; (3) integrate distributed resources; and (4) improve workforce and asset management. D.P.U. 12-76-A at 3. All four of these objectives are valid, reasonable and appropriate "directives" in light of today's operating environment. The Department's specific directives regarding the requirement to develop and implement a Comprehensive Advanced Metering Plan ("CAMP") meeting seven pre-designated criteria that can only be met with the implementation of Advanced Metering Infrastructure are not the "correct directives" for electric distribution companies. The Companies have addressed the reasons for this conclusion in their comments on the Straw Proposal.

2. Has the Department established appropriate priorities and timelines for grid modernization?

The Companies have offered several recommendations relating to the requirement and timing of the submission of a CAMP. In sum, the Companies recommend that the Department modify its mandate regarding implementation of the CAMP to establish the seven functionalities as optional, long-term guidelines for CAMPs, rather than required elements. In addition, the Department should reaffirm that electric companies retain the discretion to structure GMPs to incorporate components identified by the Companies as furthering the four grid-modernization objectives, subject to the approval of the Department. This flexibility will allow the Companies to design GMPs that are cost-effective, beneficial and assist in the continued modernization of

the electric grid; thereby creating a regulatory construct consistent with the Companies' public service obligation to provide safe and reliable service to customers.

In addition, as described in the Companies' comments, the pending investigations by the Department into TVR and cyber-security should be completed before requiring the submission of a CAMP. This will ensure that assumptions of costs and benefits are aligned with outcomes of those proceedings. The timeline set out by the Department for filing of a CAMP is likely too aggressive to allow for reasonable consideration of these important issues.

3. Is the Department's requirement to achieve advanced metering functionality appropriate?

The Department's requirement to achieve advanced metering functionality is not appropriate, particularly where the seven functionalities identified by the Department are made mandatory. The Companies provide extensive comments on this question in Section II.B.1 - Advanced Metering Functionality. In summary, an Advanced Metering System is not a "basic technology platform" for grid modernization and is not needed to realize "all of the benefits of grid modernization."

4. Which aspects of the benefits cost analysis should include industry-wide figures?

The cost-benefit analysis should incorporate company-specific information wherever practical and feasible. If industry-wide figures are used, emphasis should be placed on using information that represents actual deployments rather than estimated deployments. Care must be taken with industry-wide figures as that data would likely include inherent biases and differences that would skew the results, making it difficult to compare actual results to the initial analysis.

5. Which aspects of the benefits cost analysis should be company-specific?

Please see the response to Question 4.

6. Has the Department established the correct categories of benefits associated with achieving advanced metering functionality?

At this point in time, the Companies do not have additional comments regarding the categories proposed by the Department. However, as explained in section II.B.2 - CAMP Cost-Benefit Analysis, the Companies emphasize the need to include all cost impacts created by the technology implementation.

7. Should the Department establish a targeted cost recovery mechanism for CAMP investments?

Please see the Companies' comments in section II.C - Cost Recovery.

8. Should the Department review and approve a cost-tracking accounting system in advance of allowing a targeting cost recovery mechanism?

Please see the Companies' comments in section II.C - Cost Recovery.

9. What aspects of a cost recovery mechanism should the Department establish?

Please see the Companies' comments in section II.C - Cost Recovery.

10. Should the Department establish an offset to O&M expenses to recognize cost savings from grid modernization technologies?

Offsets to O&M expenses may or may not be applicable or appropriate and should be evaluated in the context of a company's cost recovery proceeding.

11. Should the Department adopt metrics in this proceeding?

Please see the Companies' comments in section II.E – Grid Modernization Metrics.

12. What information or standards on cyber-security, if any, should apply to GMPs?

Please see the Companies' comments in section II.G – Cyber-security.