THE STATE OF NEW HAMPSHIRE

before the

PUBLIC UTILITIES COMMISSION

ELECTRIC DISTRIBUTION UTILITIES

Investigation into Potential Approaches to Ameliorate Adverse Wholesale Electricity Market Conditions in New Hampshire

Docket No. IR 15-124

COMMENTS OF PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE D/B/A EVERSOURCE ENERGY

A. INTRODUCTION

On April 17, 2015, the New Hampshire Public Utilities Commission ("Commission") issued an Order of Notice recognizing that, in recent years, there has been a sizeable increase in the use of natural gas as a fuel for electric generation while at the same time significant constraints exist in relation to the natural gas supply to the New England region. As stated in the Order of Notice, these constraints have led to "extreme price volatility in gas markets in the winter months in our region, which, in turn, have resulted in sharply higher wholesale electricity prices." Order of Notice at 2. Higher wholesale electricity prices convert directly into high retail electricity prices for customers, particularly in the winter period. The Order of Notice appropriately seeks to explore a solution to the existing supply and demand imbalance that will reduce electricity costs for New Hampshire customers.

Specifically, the Commission has directed Staff to investigate the relationship between natural gas supply and electricity prices in New England and to determine whether there are reasonably available and economically effective alternatives that could be implemented by the electric distribution companies ("EDCs") to address the issue of supply and demand imbalance.

In particular, the Commission concluded:

> A targeted Staff investigation to examine the gas-resource constraint problem that is affecting New Hampshire's EDCs and electricity consumers generally may yield potential solutions to these market issues. To that end, we direct Staff to inquire with the EDCs -which are to be mandatory participants in this investigation- regarding potential means of addressing these market problems, using legal authorities such as, but not limited to, RSA Chapter 374-F; RSA Chapter 374-A; RSA Chapter 378; RSA 378:37-41; and RSA 374:57.

Order of Notice at 3.

To implement the Commission's directive an initial meeting of interested stakeholders was convened on May 12, 2015. At that meeting, the Staff described its proposed goals and methods for the investigation ordered by the Commission, and requested that interested parties provide initial information to assist with the investigation by June 2, 2015. In particular, the Staff requested that the June 2 submissions address the following items:

1. Identification of the root cause of the high winter wholesale and/or retail electricity prices.

2. How the preferred solution results in lower wholesale and/or retail electricity prices for New Hampshire consumers. For example, if the preferred solution requires one or more New Hampshire EDCs to purchase firm pipeline capacity, explain in detail how that purchase translates into lower [Locational] Marginal Prices (LMPs) for wholesale electricity customers and eventually lower electric energy rates for retail customers. Identify all steps in the process and specify all assumptions.

3. Whether the preferred solution is part of a regional solution to reduce wholesale electricity prices. If so, describe the regional solution and specify all approvals needed to ensure such solution moves forward.

4. For pipeline-based solutions, specify the firm pipeline capacity in Dth/day to be purchased by each EDC, the associated annual cost and the contract term, identify the pipeline project to which the estimated annual cost relates, provide the estimated benefit-cost ratio for such project and the projected reduction in wholesale and/or retail electricity prices.

5. For LNG-based solutions, describe the product/service offered, specify the quantity to be purchased by each EDC, the associated annual cost and the contract term, identify the

storage facilities underlying the LNG product/service and their location(s), and provide the estimated benefit-cost ratio for such solution and the projected reduction in wholesale and/or retail electricity prices.

6. For energy efficiency-based solutions, provide the incremental winter kWh savings projection for each EDC for the ten year period beginning 2018 and the associated annual costs, identify the energy efficiency measures underlying the winter period kWh savings and related lifetime benefit-cost ratios and the projected reduction in wholesale and/or retail electricity prices.

7. Whether the preferred solution will enhance reliability of the electric power system in New Hampshire and the region. If so, explain how the preferred solution enhances reliability.

8. Provide all studies that support the claimed: (i) benefit-cost ratio(s); (ii) reduction in wholesale and/or retail electricity prices and (iii) reliability enhancement.

May 14, 2015 Staff Instructional Letter in Docket No. IR 15-124 at 2.

Public Service Company of New Hampshire d/b/a Eversource Energy ("Eversource" or the "Company") provides these initial comments on the information sought by Staff in relation to retail electricity prices and the potential solutions to abate increasing bill impacts for New Hampshire customers. The Company's comments on the specific topics delineated by Staff are set forth below in sequence, but in all aspects focus on the imperative for action that currently prevails in New England's energy markets.

As discussed in detail below, New Hampshire customers are bearing the direct impact of high and volatile retail electricity prices provoked by a wholesale market imbalance of supply and demand for natural gas. Given the significant role of natural gas in New England's electric generation portfolio, now and in the future, reliability concerns and high retail electricity prices will not be alleviated until existing constraints on natural gas pipeline capacity are eliminated. Elimination of these constraints will require the construction of incremental pipeline capacity resources as no other comparable resource is reasonably available in an adequate quantity to alleviate the supply and demand imbalance in the wholesale electricity market. Construction of incremental pipeline capacity resources will take a number of years, even if new capacity contracts were already in place, which is not the case. As a result, even *immediate action* by the Commission to structure a reasonable approach to secure the reliability of electric supply and adequacy of gas supply for generation purposes would fail to afford relief for New Hampshire customers for several winter seasons. For this reason, it is imperative that the Commission act decisively and expeditiously to address the issues raised in this docket. In that regard, Eversource firmly supports the Commission's effort to identify a supply solution that: (1) will most directly and surely moderate retail electricity prices on an economically efficient basis while ensuring reliability of supply; and (2) can be implemented in the shortest possible timeframe balancing considerations of reliability and cost. These criteria are critical in meeting the interests of customers in an effective manner and attaining these objectives is possible with expeditious action by the Commission.

B. RESPONSES TO STAFF REQUEST FOR INPUT

1. Root Cause of High and Volatile Electric Prices

The issues surrounding the reliability of gas supply and related high electric prices in New England have been the subject of extensive study in the last few years. The studies that have been performed have universally concluded that increased reliance on natural gas as a fuel for electric generation without a corresponding expansion of natural gas capacity resources into New England is the primary driver of high and volatile retail electric prices.[1] This dynamic is widely recognized in the marketplace and specifically acknowledged in the Commission's Order of Notice in this proceeding.

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[1] For example, see *Massachusetts Low Gas Demand Analysis: Final Report,* dated January 7, 2015, and prepared by Synapse Energy Economics, Inc. (provided as Attachment 15). Additional studies are briefly described in Section B.8, and are attached to this submission.

Generally, these studies have concluded that New England has historically relied on a diverse mix of fuels for electric generation purposes including coal, oil, nuclear, hydro, biomass and natural gas. New Hampshire, in particular, has historically relied on a mix of electric generation fuels consistent with the state's long-standing policy of encouraging fuel and energy diversity.[2] Reliance on natural gas as a fuel source for electric generation was initially spurred by the emergence of gas-fired combined cycle units as the technology of choice for new generation. The availability of abundant domestic supplies of natural gas in combination with environmental impact concerns associated with aging coal and oil facilities has further promoted that shift, particularly during non-winter peak days. In 2000, natural gas accounted for approximately 18 percent of the region's fuel for electric generation, with that share rising to approximately 50 percent in 2014.[3] This trend appears likely to continue for a number of years.[4] Given this underlying trend, restoring a more balanced mix of fuels would require, among other things, the increased importation of Canadian hydro power and development of other renewables such as wind and solar.

While the demand for natural gas has grown tremendously in New England over the last decade, there have been only limited increases in interstate pipeline capacity into the region in the same period. Exacerbating the demand and supply mismatch is the fact that demand for natural gas is highest during the winter period (November through March) when cold weather occurs. In a constrained operating environment, winter demand for natural gas to meet heating requirements has the potential to cause price spikes for electricity as electric generators compete for interstate pipeline capacity resources that are primarily held by natural gas local distribution

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2 *See, e.g.,* RSA 4-E:1, I; RSA 362-F:1; RSA 374-F:8; RSA 378:37; and the New Hampshire Office of Energy and Planning's 2014 State Energy Strategy, available at: http://www.nh.gov/oep/energy/programs/documents/energy-strategy.pdf

3 http://www.iso-ne.com/about/what-we-do/key-stats/resource-mix

4 http://www.iso-ne.com/about/what-we-do/key-stats/resource-mix

companies ("LDCs"). LDCs hold contractual entitlements that provide priority of service to meet their customer send-out requirements under peak day and peak season conditions, leaving limited quantities of pipeline capacity for electric generators (who have not similarly contracted for pipeline capacity). As a result, the existing pipelines, for the most part, were designed to serve the load requirements of LDCs, which have historically sponsored the majority of pipeline infrastructure expansions in the region.

As a result of the LDCs' contracted reservation of the available pipeline capacity, electric generators possess only a small fraction of the mainline pipeline capacity to meet their needs and generally purchase gas in the less reliable and more volatile secondary markets. There is limited availability for gas due to the high utilization rates on the pipelines, which ultimately results in substantial volatility in market prices as there is greater demand than supply when pipeline capacity is being fully utilized by the primary firm customers. The interplay of the gas and electric markets also contributes to this issue as the marginal electric generation fuel has been natural gas, which is reliant upon these volatile secondary markets.

Natural gas pipelines rely upon "line pack" to maintain supply to all customers. Line pack refers to the volume of gas in the pipeline at a point in time. At higher pressure, a pipe of a given diameter can hold greater volumes than the same pipe at lower pressure. Sufficient pressures are required throughout the interstate pipeline system to meet customer demands, and when more gas is being taken out of the pipeline at delivery points than is being put in at the pipeline receipt points, pressure falls and line pack is reduced, which can cause operational problems. This circumstance is rectified only by limiting the quantity drawn off the system at delivery points, or by increasing supplies into the pipeline, which is not necessarily possible in many cases.

When pipelines experience or anticipate operational problems, they implement operational restrictions that require tighter balances between the quantities that shippers put into and take out of the pipeline. These restrictions or constraints, once established, carry through the entire gas day, and are removed only if and when deliveries by the pipeline drop sufficiently or incremental supplies are received by the pipeline to put the pipeline back into a balanced state. The map included as Attachment 1 depicts some of the locations of pipeline restrictions commonly implemented in New England and their relation to the gas-fired power generation facilities in the region. Increased constraints along these paths over the last several years have led to price volatility in the electric markets. Because most of the gas that enters the New England market comes in from New York state, the most significant regional constraints in New England are in the western parts of the region.

The pipelines use the various restrictions to balance the entire system throughout the gas day as operating conditions change in real time. The real-time nature of managing the pipeline operations is of critical importance as hourly flows can vary widely throughout the gas day, with peak loads typically occurring during the morning and early evening hours of each day. During these times, both heating loads and power generation tend to ramp up and require more gas to meet their demand. Electric generators have hourly load profiles that can vary greatly. Some operate as base load or intermediate units, and some are designed as “peaking facilities” which can ramp up to their maximum fuel burn on short notice, take large volumes of gas for a few hours, and then stop taking gas altogether. The New England pipelines are not designed to handle these widely varying loads, which can force generators to seek incremental supplies on short notice to avoid penalties and shut off by the pipelines, and can lead to sharp spikes in intraday prices, which are not reflected of the daily pricing index information gathered each day.

An additional consideration is the fact that New England pipeline capacity was initially built to carry gas from the west to the east and generally decreases the farther east the gas travels. Also, there is no domestic underground storage field in New England and, therefore, the majority of the gas in the region is served by gas flowing from the west. Utilities in the region resolved this issue by building "on-system" "peak shaving" facilities to store either propane or liquefied natural gas ("LNG") to be vaporized as needed during peak usage periods in order to avoid contracting for pipeline capacity that would be used on only a small number of days per year. Gas that comes from the east is either sourced from LNG imports, northeast Canadian offshore production and, to lesser extent, from western and central Canada. LNG imports are opportunistic in nature and subject to world market prices, which is part of the reason why there have been large swings in deliveries into the region. Canadian offshore supplies have also seen substantial declines in recent years.

All of these conditions are constantly changing as the operating conditions of the pipeline and customer demand vary, and this variability is reflected in the price volatility seen in the daily settled citygate delivered prices for the Algonquin and Tennessee pipelines. Since the electric generators do not contract for long term pipeline capacity and typically purchase supplies as needed, they must purchase at these volatile citygate prices, which translates into high and volatile marginal power prices through the ISO-New England ("ISO-NE") bidding process as generators seek to recover their costs with a margin of profit on the fuel they acquired to generate electricity. This results in a very high correlation between the price of natural gas and the price of electricity. Attachment 2 shows the high degree of correlation that currently exists between the prices of natural gas and electricity. Since natural gas sets the clearing price in New

England approximately 90 percent of the time, natural gas is by far the largest driver of electricity prices.

2. Portfolio Solution

As some of the recent studies conducted on the issue of natural gas supply to the region indicate, there is no single solution to the issues of high and volatile electric prices and ensuring reliable electricity in New England. Certainly, a portfolio approach is needed, encompassing the increased importation of Canadian hydro power to mitigate reliance on natural gas;[5] increased development of renewable sources of power generation – wind and solar; and the implementation of increased energy efficiency or increased intermittent renewable generation. However, these resources will not solve the gas shortage issue in New England as indicated in the Massachuestts Low Gas Demand Scenario developed by Synapse (as more fully described below in Section B.8 of these comments). In the end, and based upon the information available to Eversource, the most effective means for addressing the issues of reliability and cost of electricity is to develop incremental pipeline capacity and associated services that are capable of reliably meeting the volatility of generation loads by delivering gas supplies available in the nearby abundant shale gas production area. While securing additional gas capacity/associated storage may not be a complete solution, it is the most effective available option, and the one most likely to result in relief from volatile and high electric prices in the region.

With already significant dependence upon natural gas generation as well as the new generation planned for the region, the concern is how to ensure that the additional pipeline

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[5] Eversource notes that at least one study has shown that at least 1,000 MW of imported Canadian hydro power is needed merely to supplant the non-gas fired generation expected to be lost upon the retirement of the Brayton Point facility in 2017. See *Assessing Natural Gas Supply Options for New England and the Impacts on Natural Gas and Electricity Prices*, dated February 7, 2014, and prepared by Competitive Energy Services at 3 (provided as Attachment 12). While such power imports would not "solve" the underlying issue, they must be part of a comprehensive set of solutions for New England's electric customers.

infrastructure will be financed and paid for. Despite substantial reliance on natural gas, most power generators are unlikely to enter into long-term agreements necessary to support development of new gas delivery capacity. The mismatch of the short term nature of the electricity markets and the long term needs of financing for new gas delivery capacity makes it unlikely that the generators will, on their own, support such capacity.

Additionally, existing wholesale electricity markets do not provide sufficient revenue certainty to support the necessary financial commitments for developing new delivery capacity. The ISO-NE Pay for Performance market rules that came into place for the 2018/19 Forward Capacity Market are designed as a strong incentive for power generation to be available and to have sufficient fuel to run. However, these incentives are not likely to be sufficient to cause generators to sign long term contracts of 20 years or more. The ISO views these rules to be an incentive to put fuel in tanks short term, but not likely to incent long term contracting.[6] The expected market impacts of additional pipeline capacity also serve as an impediment to generators making financial commitments to support new capacity. The net effect is that the additional capacity would raise the generators' fixed costs in the form of pipeline payments and lower revenues from energy sales at lower clearing prices.

Alternative mechanisms that involve the use of public financing and ownership have been proposed by municipal entities, but it is unlikely those entities have the financial strength, experience or scale to implement the necessary regional infrastructure development. Even if such solutions were financially feasible, interstate pipelines are unwilling to build infrastructure for others to own, as such activities depart from their established business models of building, owning and operating these facilities for the long term. A more likely vehicle for new gas

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6 Northeast Forum on Regional Energy Solutions Remarks by Gordon van Welie, President & CEO, ISO New England April 23, 2015 (included as Attachment 3).

capacity development would be through contracts with credit-worthy EDCs, which is the solution most consistent with prevailing business models for gas pipeline development and is the one most likely to succeed in supporting new delivery capacity for the benefit of customers.

Customers will continue to face high and unpredictable electric prices until regional infrastructure is able to reliably supply the natural gas power generation fleet in New England. The addition of new gas delivery capacity supported by the region's EDCs will substantially mitigate these risks to customers.[7] Moreover, this solution most effectively meets the critical evaluation criteria, in that it: (1) will most directly and surely moderate retail electricity prices on an economically efficient and reliable basis; and (2) can be implemented in the shortest possible timeframe balancing considerations of reliability and cost. The majority of customer financial risk will be mitigated with the introduction of new capacity to regional natural gas markets and further financial risks will be mitigated through effective cost controls and processes that maximize the benefits of new delivery capacity for customers. The direct cost paid by EDCs, and ultimately recovered from customers, for the associated gas capacity (and any associated market area storage) will be subject to binding agreements and tariffs approved by the Federal Energy Regulatory Commission ("FERC"). The cost of capacity recovered through rates will be reduced by revenues received for release of capacity to generators first and foremost as needed to reliably and economically meet demand and secondarily to third-parties. Customers are also expected to benefit from an overall reduction in electricity prices that will result from power generation having increased access to a less volatile and more reliable fuel supply. A

[7] Included as Attachments 4, 5 and 6 is information relating to the proposal by various EDCs to NESCOE to act as contracting parties in a regional scenario. It should be noted that this proposal contemplated an ISO-NE administered tariff as proposed by NESCOE. The EDC proposal also contemplated state approval of tariffs to retail customers, which have supplanted the ISO-NE tariff and are the subject of this investigation among other issues.

competitive and transparent process for release of capacity will maximize the combined value of these benefits and mitigate financial risk to customers.

3. Regional Solution

New Hampshire represents a relatively small portion of the overall electric demand in New England, approximately 9 percent.[8] Therefore, it is unlikely that New Hampshire alone – even if the state and its utilities are willing – would be able to provide the necessary financial and technical support for a project of the scale necessary to meet the need for additional gas capacity in the region. Pipelines that deliver natural gas into New England from the most abundant production areas, such as the Marcellus Shale formations, currently travel through Pennsylvania, New York, Connecticut and Massachusetts and would need to be expanded. Such expansions, even if paid for by New Hampshire customers and dedicated to New Hampshire load during high demand periods, would deliver significant free ridership benefits to these states during all other periods. Furthermore, the majority of natural gas fired generation that would be served by the additional natural gas capacity for the region exists outside of New Hampshire. Nevertheless, the creation of such capacity would benefit New Hampshire's customers both through improved reliability as well as more stable and lower costs and rates. In recognition of the dynamic between the costs and benefits, the solution must be regional. This regional need has also been recognized by every governor in New England.[9]

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[8] *See, e.g.*, New Hampshire 2013-2014 State Profile prepared by ISO-NE and available at: http://www.iso-ne.com/nwsiss/grid_mkts/key_facts/final_nh_profile_2014.pdf.

[9] *See*, for example, *New England Governors' Commitment to Regional Cooperation on Energy Infrastructure Issues* stating, in part "The Governors therefore commit to continue to work together, in coordination with ISO-New England and through the New England States Committee on Electricity (NESCOE), to advance a regional energy infrastructure initiative that diversifies our energy supply portfolio while ensuring that the benefits and costs of transmission and pipeline investments are shared appropriately among the New England States." Available at: http://www.nescoe.com/uploads/New_England_Governors_Statement-Energy_12-5-13_final.pdf.

In that the solution outlined above involves the EDCs in the various states making commitments necessary to support pipeline expansion, for those EDCs to do so would require that they seek and obtain the necessary approvals in their respective states to enter into the necessary agreements/contracts and to obtain appropriate cost recovery for the costs of supporting the build out of the gas capacity.

4. Pipeline Solution

As noted, Eversource has proposed that the identified problems be dealt with through the build out of natural gas pipeline and any associated storage infrastructure necessary to provide the hourly flexibility needed to serve New England electrical generation needs. Incremental primary mainline pipeline capacity from domestic supply sources connected to the Marcellus Shale to meet the peak demand at the delivery meters or lateral heads of gas-fired generators would alleviate the constraints on the systems. The reliance on secondary and interruptible pipeline capacity has led to shortages of gas during peak winter conditions. Primary firm pipeline capacity is the most reliable gas service available and is the principal resource the LDCs have relied upon, in conjunction with on-system storage facilities, for years to safely and economically serve customers.

The current commercial market mechanisms of the electricity markets do not allow for generators to recover the costs associated with long term pipeline or storage contracts, and the financial risk is too great for them to speculate as evidenced by their shedding of pipeline capacity over the last decade. The delivery constraints are most evident in the winter period when demand for gas is highest and when gas and electric system reliability is most critical. Any reliability or gas delivery problem would have a cascading effect on electric generation as the region has become increasingly reliant on natural gas without an increase in the gas delivery infrastructure. The generators typically are looking for "just in time" gas supplies on short notice, which traditional pipeline capacity is typically not designed to serve. Therefore, while additional gas pipeline capacity is key to a solution, a gas resource of only pipeline capacity may not entirely satisfy the needs of the gas-fired generation market. Proposals that incorporate into the pipeline solution the ability to accommodate hourly load swings provide generators with substantial benefits.

Should the EDCs contract for additional pipeline and/or storage, to administer the capacity EDCs would likely use a capacity manager ("CM"). The EDCs and the CM would enter into an agreement to manage the capacity that stipulates the parameters necessary to transfer the capacity to generators as needed to promote liquidity in the marketplace. The CM would make the capacity available to generators prior to releasing any capacity to secondary markets to recognize that the primary focus of the investment is to provide reliable natural gas capacity to generators as needed. The capacity would be released under the tariff provisions of a corresponding rate schedule in order to accomplish this service priority under FERC rules. At present, Eversource anticipates that there would be a series of thresholds and directives to effectively make the capacity available for generators in the ISO-NE market on a first come first serve basis, keep a reserve in place for just in time services as needed, and optimize the value of the capacity in the secondary market. Any remaining capacity that has not been taken by the generators or held in reserve would be released to the market under FERC approved capacity release provisions.

If a sufficient amount of capacity has been acquired by the EDCs to serve a large number of generators, then the gas market reliability and liquidity would increase and prices would decrease as the secondary market would no longer be as tight since gas would be able to move more freely to various points throughout the region. By alleviating the majority or all of the constraints in the area, the marketplace should naturally move lower as more gas is available to buyers. When capacity is released, revenue generated by releasing the capacity would be credited back to the EDCs' customers net of the administrative costs to compensate the CM and the EDCs for use of their balance sheets and credit qualifications. The net dollars would ultimately be returned to customers in a tracking mechanism to offset the costs of the capacity.

Eversource cautions that there are many factors which impact the total energy costs for the ISO-NE region, including the relative value of other fuels, conservation costs, and underlying commodity basis values. There are also too many variables to precisely quantify all of the costs and benefits, and there may be greater or lesser net benefits to the region in any given year.[10] But, on average, there would be a net savings to customers realized through lower electricity prices. The New England region will also be afforded the benefits of greater natural gas and electric reliability and relief to a system that has been stressed over the last several years.

5. Role of Liquefied Natural Gas

A combination of pipeline capacity and regional storage solutions could provide the appropriate gas resources to alleviate the gas constraints in the region as it would meet the generators' need for hourly operational flexibility. A solution that includes a physical storage component located in the market region would provide a substantial improvement to the reliability of the gas infrastructure, thus making "just in time" service available locally. There have been numerous studies recently by ICF International, Synapse, Sussex Economic Advisors and Competitive Energy Services that have provided a range of scenarios indicating that from

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10 For one indication of the potential benefits, *see* the ICF International study, included with this submission as Attachment 16, stating that that based upon its analysis, the existence additional pipeline capacity could save New England customers between $0.8 billion and $1.2 billion annually.

250,000 to 2,200,000 MMBtu per day of incremental supply is required to meet the both power generation and LDC demands in the region.[11]

Using LNG generated from Northeast domestic pipeline supplies, in combination with expanded LNG vaporization capability in the region, could provide an appropriate solution, unlike imported LNG, which has lower potential to be a reliable or economically viable resource in the near or long term. For example, if prices were subsequently lowered in New England due to some amount of pipeline capacity being built, the lower prices would likely deter LNG from coming to the region as it will seek out higher priced foreign markets linked to world oil prices. The supply and demand balance will continue to ebb and flow as LNG suppliers choose their best options to arbitrage between markets in the United States and abroad. Fundamentally, for imported LNG to be a long-term, viable option, suppliers of imported LNG must offer long-term supply arrangements at prices competitive with North American shale gas and with the contractual flexibility to vary demand based on daily and/or seasonal demand changes. Given the flexibility of shipping cargoes worldwide, LNG supplies are inherently opportunistic and will be attracted to the highest price market available. While LNG prices at various locations around the world have come down in recent months, landed LNG prices in Europe and Asia remain well above domestically produced US commodity costs as shown in Attachment 7.

If the region were to rely on imported LNG and forego building capacity into New England, customers would be subjected to paying a price to importers that would be the higher of the New England delivered cost or the price of LNG in the world market. Deliveries of imported LNG also are more susceptible to interruptions than pipeline capacity. In addition, incremental pipeline capacity affords significant and crucial operational benefits that are not realized by imported LNG. In the past, New England has attempted to rely on imported LNG infrastructure,

[11] *See* Section B.8 for information on the referenced studies.

but this has proven to be a costly proposition as consumers continue to pay the highest energy prices in the country.

6. Energy Efficiency Solution

Eversource supports the expansion of energy efficiency in New Hampshire and in the region more broadly.[12] Energy efficiency is critical in helping customers manage their energy costs and mitigate the impacts of higher energy bills in the near term. Additionally, energy efficiency is part of the overall longer term solution to address energy prices in New Hampshire. In New Hampshire, Eversource, along with other utilities, has successfully implemented numerous energy efficiency programs (known as the CORE Programs) for many years and is regularly looking for ways to expand and improve those programs and offerings. Through the CORE programs the utilities in New Hampshire have reduced regional peak electric demand by more than 8 MW and have the ability to expand that further.[13] Eversource is also participating in the Commission's investigation into the most appropriate means to implement an energy efficiency resource standard which, if successful, could result in meaningful overall reductions in demand for electricity, which could lead to a decreased need for natural gas to support electric generation.[14]

As shown in Massachusetts and Connecticut, Eversource has the capacity, capability and expertise to scale energy efficiency to higher levels as needed. It should be noted that there are limits to what can be provided by the implementation of energy efficiency, and the Commission's Staff has noted that substantially increasing the funding for energy efficiency

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12 Eversource, along with other utilities in New Hampshire, recently stated support for the implementation of an energy efficiency resource standard in New Hampshire under appropriate circumstances. *See* April 3, 2015 Comments of the CORE Utilities in Docket No. IR 15-072.

13 See September 12, 2014 New Hampshire Statewide CORE Energy Efficiency Plan at 19, filed in Docket No. DE 14-216 and available at: http://www.puc.nh.gov/Regulatory/Docketbk/2014/14-216/LETTERS-MEMOS-TARIFFS/14-216%202014-09-12%20PSNH%202015-2016%20NH%20STATEWIDE%20CORE%20EE%20PLAN.PDF.

14 *See* Docket No. DE 15-137

projects may not have sufficient political acceptability to occur.[15] While there are noticeable benefits achieved through the present CORE programs, without an increase in funding it is unlikely that there would be a reduction in peak demand sufficient to result in a material reduction in gas demanded for electric generation. Moreover, Eversource notes that in the recent Synapse study relating to Massachusetts (which has significantly increased its energy efficiency activities as compared to New Hampshire) the benefits of energy efficiency in that state were not sufficient, by themselves, to prevent the need for additional natural gas capacity.[16] Eversource believes that there are meaningful and substantial benefits for both customers and the region that result from the implementation of greater levels of comprehensive energy efficiency. Eversource is ready, willing and able to support, develop, and/or evaluate energy efficiency proposals that contribute to solving the region's energy infrastructure issues.

7. Reliability Enhancement

In addition to the cost and price benefits outlined above, additional pipeline and storage capacity will also improve regional reliability. On particularly cold days in the winter, when heating demand is highest and capacity on the secondary markets is extremely low, without additional capacity it is likely that numerous natural gas generators either cannot secure the fuel they need or, if they can, it is at extremely high cost. The result is that many generators will not run at all or that they will only run at reduced levels to accommodate the amount of gas available to them. Given the reliance of the region on natural gas generation, having these generators offline presents substantial reliability risks to the New England system. While market-style interventions such as ISO-NE's Winter Reliability Program have been able to fill the gap created

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15 *See* March 16, 2015 Straw Proposal and Report of Staff in Docket No. IR 15-072 at 37 available at http://www.puc.nh.gov/Regulatory/Docketbk/2015/15-072/LETTERS-MEMOS-TARIFFS/15-072%202015-03-16%20STAFF%20STRAW%20PROPOSAL%20RPT.PDF.

16 *See* Attachment 15 at 83 (describing the energy efficiency assumptions underlying the "low demand" scenario).

by these unavailable gas units, the continuing retirement of non-gas generation coupled with the expansion of the reliance on gas generation over the next 5 or more years will exacerbate the reliability concerns.

The construction of incremental pipeline capacity will provide guaranteed capacity to deliver gas to the specific delivery locations incorporated into the design of the pipeline's facilities. The coupling of incremental pipeline capacity with market area storage enables the pipeline to provide valuable operational services to meet the variable hourly needs of the generators. Pipeline capacity is not fungible; pipeline facilities designed to deliver a certain volume of gas to the first meter in the state served by a pipeline would not be the same as the facilities required to serve the last meter on the line or on a lateral and would not be likely to be able to serve the same quantity of gas to the last meter on the system, given the current capacity constraints.

Highlighting this concern, the study by ISO-NE at the end of the 2013/14 winter[17] stated that given the projected gas supplies, electric system reliability during the winter months would be compromised by sustained cold weather. As stated by ISO-NE, if there is an assumption of "Extreme Gas Prices" (>$20/MMBtu, meaning many oil units would be in-merit) and the same weather conditions as the prior winter, winter peak day gas supplies which included a large amount of imported LNG would be barely adequate or slightly in deficit through 2020, as long as there are no major non-gas fired capacity outages; a disruption to gas supplies or a nuclear unit outage would result in a serious gas supply deficit.

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[17] ICF Presentation to Planning Advisory Committee, dated April 29, 2014 (included as Attachment 8).

In addition ISO-NE's CEO's presentation on the State of the Grid update to the media dated January 21, 2015[18] stated that operational options are limited in the winter and becoming more constrained, and that gas pipelines are severely constrained when weather is very cold, sometimes limiting gas generation to minimal levels. He further noted that oil-fired generators have been vitally important to reliability but that the oil-supply chain is fragile and unable to respond quickly during adverse weather conditions and/or when demand is high. In addition, he stated that post-winter retirements of non-gas generators in 2014 removed capability (2.6 million MWh) greater than that procured through the 2013/2014 Winter Reliability Program (1.9 million MWh) and that the region is highly vulnerable to the loss of large non-gas generators during cold weather (*e.g.*, nuclear units).

To further underscore the point, similar comments were delivered only a few weeks ago[19] emphasizing that gas generators have stated to ISO-NE that the most cost-effective solution for them is to continue to utilize the pipelines when they are unconstrained and to switch to burning oil when gas transportation becomes unavailable. According to the ISO-NE CEO, "While the ISO may be satisfied with this solution from a reliability perspective, the states may not be satisfied from an environmental perspective. And given that dual fuel will not directly relieve the gas pipeline constraints, it is unlikely to resolve the issue of gas price volatility during the winter months."[20] He continued, "I worry too about the long-term reliability of a system that is so fuel constrained, particularly during the winter. We are currently maintaining reliability by relying heavily on older oil and coal resources, and we know that these resources are the most likely to retire in the coming years. In fact the largest coal and oil generator in New England will

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[18] Included as Attachment 9.
[19] Northeast Forum on Regional Energy Solutions Remarks by Gordon van Welie, President & CEO, ISO New England April 23, 2015, Included as Attachment 3.
[20] *Id*. at 5.

retire in June 2017. And the constraints on the fuel system supplying New England make us that much more vulnerable to the outage of a large non-gas generator or transmission line during extremely cold weather."[21] He concluded by noting "In summary, all these indicators seem to point in the direction of increasing the capacity of the gas infrastructure serving New England in order to mitigate the risks facing the region and facilitate the integration of additional renewable energy."[22]

8. Supporting Studies

Any new gas infrastructure in the region will have higher costs than the historic system rates currently in service in New England. However, the reliability benefits and cost savings generated by diminished reliance on constrained secondary gas markets are confirmed in numerous studies. As noted in the prepared remarks of Mr. Thomas May before the Department of Energy at its Quadrennial Energy Review Meeting in April 2014, New England customers paid an additional $3 billion more for electricity in the winter of 2013/14 than in prior winters primarily as a result of gas constraints.[23] These prices were reflected in retail rates this past winter with New Hampshire customers seeing between a 60% and 100% increase in the commodity portion of their bill.

Although wholesale rates decreased this last winter, a study commissioned by Access Northeast (an Eversource affiliate) and conducted by ICF International found that under normal weather conditions, consumers would save a net $600 million a year in reduced costs through the addition of 0.9 BCF of pipeline and LNG capacity.

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21 *Id*.

22 *Id*.

23 *See* Attachment 10.

Another study published by Sussex Economic Advisors provided a range of annual cost savings for 1,000,000 MMBtu per day of capacity into the region.[24]

Studies also demonstrate that pipeline expansion projects have relatively long lead times. For example, Access Northeast and Kinder Morgan's NED project are offering capacity with prospective in-service dates in 2018. Ultimately, EDCs would perform an analysis of the alternative solutions and would present that analysis/proposed solution to regulators. Such analysis would consider need, as well as price and non-price factors, with the objective of ensuring that EDC customers have a reliable and reasonable cost supply.

Lastly, there may yet be other pipeline-based solutions presented that could address the natural gas capacity issue identified by the Commission. Eversource is interested in learning of such proposals and whether to what extent those proposals ensure reliability and lower costs and volatile electric prices in the region.

The Company specifically notes the following studies that address the issues of natural gas supply, reliability and costs:

i. *Natural Gas Infrastructure and Electric Generation: Proposed Solutions for New England*, dated August 26, 2013 and prepared by Black & Veatch for the New England States Committee on Electricity (included as Attachment 11).

Key Finding(s) (page 11):

> In the absence of greater demand reduction / energy efficiency/ non-natural gas-powered distributed generation solutions, a Cross-Regional Natural Gas Pipeline solution presents higher net benefits to New England consumers than do alternative long-term solutions (2017-2029).

[24] *See* Attachment 13.

ii. *Assessing Natural Gas Supply Options for New England and their Impacts on Natural Gas and Electricity Prices*, dated February 7, 2014 and prepared by Competitive Energy Services for The Industrial Energy Consumer Group (included as Attachment 12).

Key Finding(s) (page 3):

> There has been a fundamental shift in the New England natural gas market since 2012 that is causing price spikes during winter months to be much higher and more frequent than they have previously been and 1 bcf/d of additional pipeline capacity into the region will provide partial relief to the region from high natural gas and electricity prices. The 1 bcf/d of additional pipeline capacity will reduce the number of hours each winter that New England must rely on expensive Liquefied Natural Gas by over 800 hours. 2 bcf/d of additional pipeline capacity is required to eliminate the natural gas price differential between New England and pricing points to the region's west and south and the additional 1 bcf/d above that previously proposed will provide the region's electricity consumers$600 million a year in reduced costs beyond the savings they will realize as a result of the 1bcf/d incremental capacity. This represents a 1 to 3 year payback period on the incremental pipeline investment, depending on the sequencing of the pipeline expansions.

iii. *Maine Public Utilities Commission Review of Natural Gas Capacity Options*, dated February 26, 2014 and prepared by Sussex Economic Advisors for the Maine Public Utilities Commission (included as Attachment 13).

Key Findings(s) (page 64):

> Incremental natural gas pipeline capacity into the New England region would place downward pressure on the regional natural gas price indices and, therefore, benefit customers who use those price signals in transactions (e.g., electricity generation segment). The benefit in the form of reduced natural gas costs and, therefore, lower LMPs as compared to the cost estimates was estimated to be that a 40% basis reduction more than offset the annual costs of a 50,000 Dth/day contract assuming a daily rate as high as $2.00/Dth.

iv. *Assessment of New England's Natural Gas Pipeline Capacity to Satisfy Short and Near-Term Electric Generation Needs: Phase II*, dated November 20, 2014 and prepared by ICF International for ISO-New England (included as Attachment 14).

Key Finding(s) (page 5):

> Despite the increase in currently contracted capacity on the interstate pipelines and the likelihood of new capacity being added by the end of 2016, the New England market is likely to remain supply constrained through 2020. The updated forecast for capacity retirements results in very little change in projected gas consumption for electric generation. The Winter Near-Peak analysis indicates that gas supply deficits may occur not just on peak days, but also on multiple high demand days throughout the winter. Based on projected gas supplies, LDC demands, and electric generator gas demands, there is a high probability that the electric sector will have a gas supply deficit on 24 to 34 day per winter by 2019/20.

v. *Massachusetts Low Gas Demand Analysis: Final Report*, dated January 7, 2015 and prepared by Synapse Energy Economics, Inc. for the Massachusetts Department of Energy Resources (included as Attachment 15).

Key Finding(s) (pages 2-3):

> The study examined 8 scenarios involving increased penetration of energy efficiency and large renewable energy additions as well as the addition of large hydro transmission imports. Notwithstanding these additions, the underlying conclusion was:
>
> The amount of pipeline required differs based on scenario assumptions (see Figure ES-1). Year 2020 pipeline additions range from 25 billion Btu per peak hour to 33 billion Btu per peak hour (0.6 billion cubic feet (Bcf) per day to 0.8 Bcf per day). Year 2030 pipeline additions range from 25 billion Btu per peak hour to 38 billion Btu per peak hour (0.6 Bcf to 0.9 Bcf per day).

vi. *Access Northeast Project – Reliability Benefits and Energy Cost Savings to New England*, dated February 18, 2015 and prepared by ICF International for Eversource Energy and Spectra Energy (included as Attachment 16).

Key Finding(s) (pages 7-14):

> New England needs incremental firm natural gas supplies for the electric sector during winter months and New England's reliance on non-firm winter gas supplies poses increasing risks on electricity consumer costs. Access Northeast will enhance New England's grid reliability, complement the ISO-NE's market improvements to incentivize generation availability, and support the region's

renewable energy goals and New England could have saved $2.5 billion in wholesale electric costs had a project like Access Northeast been in operation during the 2013 – 2014 winter.

C. CONCLUSION

As noted at the outset in these comments, Eversource firmly supports the Commission's effort in this docket to begin identifying the solutions that will most directly and surely moderate retail electricity prices on an economically efficient basis and that can be implemented in the shortest possible timeframe balancing considerations of reliability and cost. New Hampshire customers are being directly affected by high and volatile retail electricity prices resulting from a wholesale market imbalance of supply and demand for natural gas and in light of the significant role of natural gas in electric generation in New England. Reliability concerns and high retail electricity prices will not be addressed until existing constraints on natural gas pipeline capacity are eliminated. Eversource supports a region-wide portfolio of solutions to the problems of high and volatile electricity prices. The Company also recognizes that one necessary solution involves eliminating gas pipeline constraints by constructing incremental pipeline capacity. The need to take decisive action is urgent. Even if contracts for interstate pipeline were in place this year, the earliest new facilities of the scale needed to resolve the gas supply constraints would be 2018 at best. The leaves New Hampshire customers exposed to winter price volatility over the next several years. The Company remains committed to work with the region to address this urgent matter.