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NATURAL GAS IN NEW HAMPSHIRE

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EXECUTIVE SUMMARY

This report presents an overview of natural gas and its role in New Hampshire's energy future. There has a been a large increase in the use of natural gas in New England in the past decade, but the infrastructure for transporting natural gas has not been updated. Infrastructure constrains have been a contributing factor to volatile energy prices in New England. This paper provides an in depth background of natural gas and energy trends in New Hampshire and New England. The report aims to give the New Hampshire House Science, Technology, and Energy Committee an overview of natural gas and the potential options for reducing capacity constraints on New Hampshire's natural gas infrastructure. The different options have varying implications for the role of natural gas in New Hampshire's energy future. Building new pipelines would result in a longer-term commitment to using natural gas as a fuel source than short-term options such as improving existing natural gas infrastructure and incentivizing energy efficiency.

1. INTRODUCTION

Along with the rest of New England, New Hampshire has significantly increased its consumption of natural gas during the past decade. A boom in U.S. natural gas production has led to a decline in natural gas prices and fuel switching from coal to natural gas for electricity generation. Natural gas consumption has also increased as a result of fuel switching from heating oil to natural gas.[1] Natural gas offers some environmental benefits over other fossil fuels, but it still has environmental impacts that must be considered. There are signs that the existing infrastructure for natural gas transportation in New Hampshire is not adequate to meet the increased consumption. The New England States Committee on Electricity (NESCOE) has described the current situation as "unsustainable".[2] Volatile energy prices put stress on consumers and businesses and hinder economic competitiveness.[3] This report seeks to provide background on natural gas, energy consumption trends in New Hampshire, and the potential options in improving energy infrastructure and reducing constraints on the supply of natural gas in New Hampshire. In order to reduce constraints on the supply of natural gas in New Hampshire, it will be essential to consider building new infrastructure to transport natural gas, repairing existing pipelines, incentivizing energy efficiency, and increasing renewable energy.

2. OVERVIEW OF NATURAL GAS

2.1 What is Natural Gas?

Natural gas is a non-renewable fossil fuel resource that is conventionally found alongside petroleum reserves, but that can be also located in shale rock.[4] Like all fossil fuels, its extraction and combustion emits greenhouse gases (GHGs). Natural gas is a much cleaner fuel than coal, as it does not emit high amounts of sulfur dioxide or mercury compounds.[5] The development of horizontal drilling with hydraulic fracturing, often

referred to as "fracking" has enabled significant increases in the extraction of natural gas in the United States.

Hydraulic fracturing involves the usage of horizontal drilling technology that utilizes various chemicals and water to create fissures in shale rock, which is porous and high in natural gas. Once a well is dug, multiple fissures can be made, and gas is collected.[6] Horizontal drilling allows for multiple access points resulting from a single well, which makes it a desirable method.[7] Today, there are 11,000 such wells being drilled every year.[8] While this source of natural gas only comprised three percent of the country's overall gas production in 2005, it was 35 percent of the total amount in 2012 and is expected to reach 50 percent by 2035.[9]

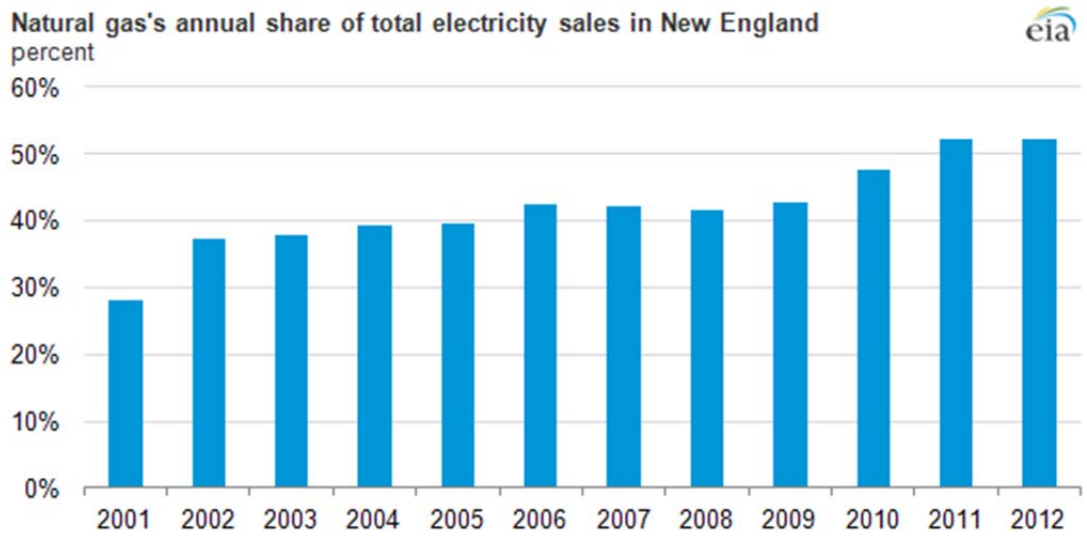
2.2 Increasing U.S. Natural Gas Production

During the past decade, the U.S. has significantly increased its production of natural gas. Technological advances, such as horizontal drilling for hydraulic fracturing have been a major factor driving the increased production. U.S. natural gas production has reached a historic high and the U.S. is now the world's largest producer of natural gas.[10] The major regions of shale natural gas production include the Bakken in North Dakota, Eagle Ford in Texas, and Marcellus in Pennsylvania and West Virginia.[11] Coinciding with the increase in production, natural gas prices have declined significantly. This has led to major shifts in the U.S. energy market as electric utilities have replaced coal power with natural gas. Since 2011, one-fourth of coal power plants in the U.S. have been retired.[12]

2.3 Increasing Natural Gas Consumption in New England

As shown in the figure below, New England has increasingly relied on natural gas for electricity generation. The share of natural gas for electricity generation has almost doubled in the past decade. This trend will continue as more coal power plants are retired in New England along with the recent closure of Vermont Yankee nuclear power plant. Vermont Yankee accounted for 70 percent of Vermont's electricity generation, and 4 percent of New England's total electric generation.[13] Dominion Energy Resources is planning to close the Salem Harbor coal plant in Massachusetts. Altogether this will result in 1,369 MW of generation retired in New England by 2016.[14] In replacing this capacity, half of the new generation is expected to come from wind and half is expected to come from natural gas.[15] Additionally, the Brayton Point coal plant in Somerset, MA is expected to close in 2017.[16]

Figure 1: Natural Gas Consumption in New England (2001-2012)



Source: Energy Information Agency

2.4 Needed Infrastructure

The significant increase in natural gas consumption in New England has led to transportation constraints. Infrastructure for transporting natural gas has not kept up with the increase in natural gas consumption. These infrastructure constraints are most extreme during the winter. There is currently a pipeline being proposed, in attempt to alleviate transportation constraints that would bring natural gas from the Marcellus region in Pennsylvania through New Hampshire and into New England.[17]

2.5 Environmental Impacts of Natural Gas (and Hydraulic Fracturing)

The main environmental concerns relating to natural gas concern its contribution to climate change and also local environmental issues near the source of extraction such as ground and water contamination.

2.5.1. Greenhouse Gas Emissions and Climate Change

Compared to coal, natural gas produces half the carbon dioxide per unit of energy.[18] The potential for natural gas to have a lower impact on climate change is complicated by the methane emissions that result from its extraction and transportation. Natural gas is composed of methane, a greenhouse gas that is over 20 times more potent in warming than carbon dioxide over a 100-year time span.[19] Because methane resides in the

atmosphere for a shorter amount of time than carbon dioxide, its impact on climate change is even greater in the short term, being 80 times more potent than carbon dioxide over a 20-year time span. Methane is the second most prevalent greenhouse gas emitted in the U.S. after carbon dioxide.[20] There is uncertainty about the level of methane leakage that occurs during the extraction and transportation of natural gas, and the level of leakage determines whether natural gas has a benefit in reducing impacts on climate change compared to coal.[21] Therefore the potential benefits in addressing climate change by switching from coal to natural gas are unclear.

2.5.2. Groundwater Contamination and Waste Water Pollution

Ground water contamination and wastewater pollution is another environmental issue that can result from natural gas extraction.[22] In the Energy Policy Act of 2005, Section 322 allows for an exemption of new horizontal hydraulic fracturing technologies from the Safe Drinking Water Act. [23] The Environmental Protection Agency is currently conducting studies to determine potential impact that hydraulic fracturing has on drinking water resources.[24] While the local environmental impacts of natural gas extraction do not affect New Hampshire since there is no natural gas production in the state, it is still important to be aware of the environmental impacts.

2.5.3. Bridge Fuels

Natural gas it is oftentimes framed as a transition or "bridge" fuel, based on its perceived ability to help ease the transition from dirtier fossil fuels such as coal to renewable energy sources.[25] This is a critical issue to evaluate when considering the role of natural gas in New Hampshire's energy future. While there are some environmental benefits provided by switching from coal to natural gas, there is also the possibility that increasing the use of natural gas will slow the transition to renewable energy. Some economic models have found that an abundant of supply of natural gas will have little impact on reducing greenhouse gas emissions because it will reduce the deployment of renewable energy and also result in increased electricity consumption.[26]

3. ENERGY IN NEW HAMPSHIRE

3.1 Energy consumption in New Hampshire

The chart below outlines the sectors of energy consumption in New Hampshire. Natural gas is used in all sectors except for transportation. One in five New Hampshire homes uses natural gas for primary home heating.[27]

Figure 2: New Hampshire Energy Consumption by End-Use Sector, 2012

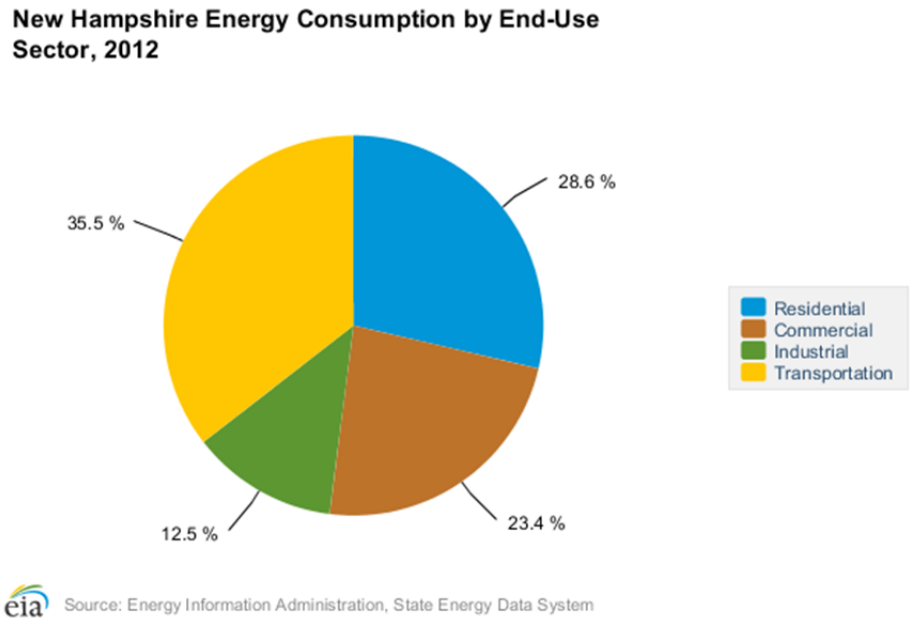
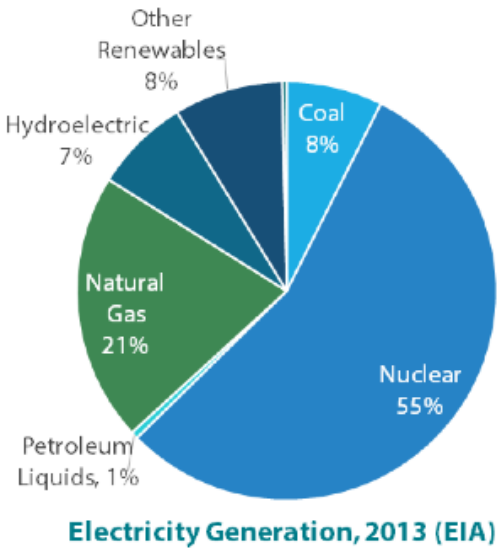


Figure 3: New Hampshire Net Electricity Generation by Source, 2013



Nuclear energy is the single largest source of electricity generation in New Hampshire, as 55 percent of electricity generation in 2013 came from the Seabrook Nuclear Power Plant.[28] Natural gas is the second largest source for electricity generation in New Hampshire, providing 21 percent of electricity generation. New Hampshire does not have any natural gas reserves; therefore all natural gas must be imported.[29]

3.2 The role of renewable energy

New Hampshire's renewable portfolio standard was signed into law in 2007. The law required suppliers of energy in New Hampshire to obtain 25 percent of their energy from renewable energy sources by 2025.[30] In 2013, 16 percent of electricity generation in New Hampshire came from renewable sources.[31]

Renewable energy is a key factor in reducing the strain on New England's natural capacity, especially in times of peak demand. During the polar vortex in 2014, wind power helped support the reliability of the grid and reduce price spikes throughout the U.S.[32] In congressional testimony, ISO New England stated that renewable energy resources "were an important part of the power mix" during the past winter. Wind generation has grown in New England from two megawatts in 2005 to its current level of over 700 MW.[33]

4. OVERVIEW OF ENERGY DEMAND

In early 2013, New Hampshire began to develop a ten-year energy strategy.[34] This new energy strategy includes renewable energy, fuel diversity, and energy efficiency. Price volatility for natural gas is a major issue area. Low winter temperatures and increased reliance on natural gas have led to price spikes. Officials worry that suppliers will not be able to keep up with demand for heating and electricity during periods of high demand during cold spikes.

4.1 What is Peak Demand?

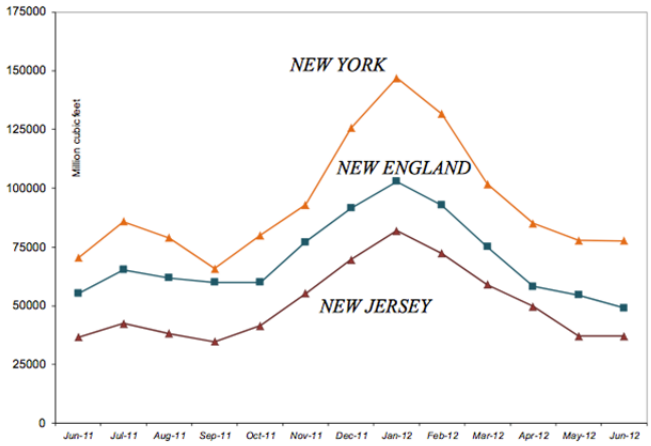
Understanding peak demand is a crucial step in taking control of energy use and reducing costs. In many cases electricity use is metered based on total consumption in a given month, and demand is based on the highest capacity required during the given billing period. During the year, energy demand fluctuates depending on weather conditions. Peak demand describes a period of strong consumer demand or the highest demand in a billing period. The peak period refers to when the demand for electricity is at its highest.[35] Base load, renewables, and energy efficiency are all shifting curves with

regards to peak demand.[36] In states with harsh winters, such as New Hampshire, peak demand occurs during periods of extremely cold temperatures.

4.2 Natural Gas Demand in New England

A shift in the New England natural gas market occurred in 2012, which caused price spikes during winter months to be much higher and more frequent than in the past.[37] Peak demands due to cold weather and higher usage of natural gas are driving capacity shortage situations and price spikes in New England. New England is a winter-peaking region with high monthly variations in natural gas consumption. The highest send out in the annual cycle occurred for the 2012-2013 season occurred in January.[38] Figure 4. shows the monthly variations in natural gas consumption.

Figure 4: Monthly Natural Gas Consumption



Source: U.S. Energy Information Administration, "Natural Gas Monthly"

New England is projected to have the highest natural gas prices in the world in the winter of 2015 due to the low supply of natural gas in the region.[39] For the winter months, gas is trading at around $20 per million BTU, compared with $3 in other parts of the United States. Existing pipelines cannot accommodate the greater demand for natural gas. Power plants were forced to buy on the spot market, which is what pushed up natural gas prices for consumers.[40] The New England market continues to be the most price-sensitive markets in the country due to its pipeline constraints and the impact of the weather on the market.[41]

4.3 Consequences for New Hampshire

A large percentage of New Hampshire's energy resources come from imported sources. Due to this, the state's energy supply is vulnerable to disruptions from facets such as weather, price volatility, changing dynamics in the commodities market, political unrest, and other factors beyond our control.[42]

The Winter of 2014 caused a shock to the natural gas system since the demand for natural gas skyrocketed due to extreme temperature drops. Wholesale electricity prices briefly shot up to $1,290 per megawatt hour compared to a yearlong average of $36 per megawatt hour due to a natural gas shortage.[43] The demand for natural gas continues to grow as more utilities are switching to natural gas for electricity generation. The demand for natural gas supplies is projected to increase through the end of the decade from anywhere between 0.250 Bcfd to as much as 0.900 Bcfd during peak demand days during the winter.[44]

A crucial energy issue that the state of New Hampshire needs to address is the issue of energy demand. Over the past few winters the state has dealt with fluctuating spikes in energy demand, which has caused prices to skyrocket. The top concern for lawmakers is price, which was made clear during the 2014 New Hampshire Energy Summit held on September 22 in Concord. At the summit Governor Maggie Hassan stressed the idea that "the cheapest unit of energy is the one you don't have to buy."[45]

In an interview conducted on October 27, 2014, Dartmouth College Professor of Economics Erin Mansur stressed the idea that the first step is to reduce the demand, and if reductions do not work, then to focus on increasing supply. However, increasing the energy supply will not necessarily lower the demand for natural gas in New Hampshire, but could also increase it. Professor Mansur recommended real time pricing of energy demand as a more appropriate method of dealing with peak demand, which would cut down prices.

4.4 *Addressing Supply*

If New Hampshire chooses to invest in natural gas as a viable energy source, new pipelines are needed. Construction of new pipelines is a difficult process, since pipeline companies are reluctant to build without assurance from customers that they will commit to buying up the increased gas supply.[46] Building new pipelines is not an immediate solution to the problem, since most projected pipelines would take years to construct. Kinder Morgan the largest energy infrastructure company in North America has proposed a plan. The company manages the largest network of natural gas with over 68,000 miles of pipelines.[47] The Tennessee Gas Pipeline Company a subsidiary of Kinder Morgan is developing the Northeast Energy Direct Project that will help meet the increased demand of natural gas. This will occur by upgrading the infrastructure in Pennsylvania, New York, Massachusetts, New Hampshire, and Connecticut. The pipeline will carry natural gas supplies from Pennsylvania and New York into New England.[48] While the project aims to bring natural gas to new markets and lower electric and gas prices it has faced many obstacles. The project would not begin transporting gas until November 2018 at the earliest. Currently the plan has already faced opposition by local residents in towns where the new pipeline would be built. Kinder Morgan is covering the costs of building the pipeline. In New Hampshire this proposed pipeline would not affect taxpayer money, but

it could create a burden on the land. Natural gas infrastructure can cause environmental damage.

4.5 Current Situation in New Hampshire

The winter of 2015 has defied expectations and led to lower electricity prices than last year. Spot market prices are more than 75 percent lower than last year. In 2014 the spot market price of a kilowatt-hour of electricity was 23.7 cents. In 2015 the price was 5.6 cents.[49] While the spot market price is lower than last year, customers in New Hampshire are paying more for their electricity than last year around 15.5 cents per kWh. As mentioned earlier, cold temperatures in 2014 caused most of the pipeline capacity to be used up by utility customers for heating purposes. Due to this very little gas was left for power producers without long-term contracts, which caused the price spikes.[50] It was assumed that this winter would see the same issues, which caused prices to climb in the fall when people bought natural gas on the futures market. Utilities lock in their prices around this time, which is why prices are so high despite the low prices of energy.[51] All of this premature planning was unnecessary. Worldwide natural gas prices have dropped almost half. Oil prices have dropped as well, which gives homeowners a cheaper alternative if natural gas prices increase.[52] Unlike last winter premature planning has led to excess in energy. A way to fix this issue would be to teach customers how to buy electricity just as they buy heating oil.

5. OPTIONS FOR REDUCING CONSTRAINTS ON NATURAL GAS CAPACITY

5.1 Energy Mix of New England States

Due to its reliance on nuclear energy, New Hampshire is less dependent on natural gas than other New England states. In 2013, natural gas accounted for 21 percent of New Hampshire's electricity generation. This compares to 34 percent (Maine), 44 percent (Connecticut), 62 percent (Massachusetts), and 98 percent (Rhode Island).[53] Vermont has used not natural gas as a source for electricity generation, but this may change due to the closure of Vermont Yankee nuclear facility in 2014.

5.2 Energy Efficiency

Energy Efficiency already plays a major role in New England's energy mix and it will continue to play a major role in reducing electricity demand. ISO New England estimates that electricity consumption will remain flat through 2023, due in part to energy efficiency measures.[54] New England is national leader for energy efficiency, but New Hampshire lags behind the other New England states. New Hampshire also allocates the least amount of funding of any New England state on energy efficiency initiatives.[55] Massachusetts has been ranked as the number one state for energy efficiency for four years in a row and Vermont, Connecticut, and Rhode Island have consistently been

ranked in the top five nationally New Hampshire has been ranked in the range of the low 20s. Massachusetts, Vermont, and Rhode Island have especially received recognition for their leadership on utility-sector energy efficiency programs.

Massachusetts has implemented a number of measures that have resulted in its top ranking for energy efficiency. Initiatives include requiring gas and electric utilities to save a growing percentage of energy every year through energy efficiency, promoting combined heat and power technology, and incentivizing efficient building codes.[56] Massachusetts, Rhode Island, Vermont have established energy efficiency resource standards (EERS), which require utilities to meet specific energy savings targets through customer energy efficiency programs. The EERS in each state sets a saving target for electricity at a minimum of two percent and for natural gas at one percent. Massachusetts, Rhode Island, and Vermont all allocate funding for energy efficiency programs that is greater than five percent of state wide utility revenues. New Hampshire only allocates 1.5 percent.[57] Massachusetts, Rhode Island, and Connecticut have incentivized utilities to implement energy efficiency measures through decoupling. Decoupling incentivizes energy efficiency efforts by disassociating a utility's revenue from its sales. Under the traditional model, utilities have a disincentive to promote energy efficiency because reduced sales result in lower revenues. New Hampshire has not implemented decoupling for electric or natural gas utilities.[58] Improved energy efficiency would help New Hampshire immediately reduce the strain on natural gas capacity.

5.3 Natural Gas Pipeline Leaks

Reducing leaks from existing natural gas pipelines would be another measure that would provide immediate relief for New Hampshire's natural gas capacity. In the time period between 2000-2011, consumers nationwide paid over $20 billion for leaked natural gas that was never used.[59] New England has some of the oldest natural gas infrastructure in the country and also one of the highest leakage rates.[60] This is because natural gas pipeline infrastructure in New England relies heavily on cast iron and bare steel, which are the most leak-prone pipe materials. There are few incentives for companies to replace leaky pipes and companies replace less than five percent of their leakiest pipes each year. Federal pipeline regulations only require replacement of hazardous leaks that pose imminent threat.

A number of states have implemented measures to incentivize the replacement of pipeline leaks. These measures include establishing a timeframe for repairing non-hazardous gas leaks and limiting the amount that companies can charge consumers for lost gas. Requirements for repairing non-hazardous gas leaks are one of the factors attributed to Maine's success in having one of the lowest lost gas rates in the country.[61] Massachusetts passed legislation in 2014 that establishes a timeline for natural gas pipeline repairs based on the severity of the risk, allows companies to recover the costs of repairs, and requires more transparency from companies in disclosing pipeline leaks and efforts to make repairs.[62]

5.4 New England States Committee on Electricity (NESCOE) Report

In August 2013, the engineering consultancy Black & Veatch released a report commissioned by NESCOE that examined New England's natural gas infrastructure future for the period 2014-2029. Black & Veatch summarized the current situation by saying that "New England's natural gas infrastructure will become increasingly stressed as regional demand for natural gas grows, leading to infrastructure inadequacy at key locations."[63]

The report consisted of three different scenarios; a base case, high demand case, and a low-demand case. In the base scenario, electricity demand grows as projected by ISO-New England (the independent nonprofit corporation responsible for operating the grid in New England). In the high demand scenario, it assumes higher electricity demand growth, shortfalls in meeting renewable energy goals, and early retirement of nuclear power plants. The report found that in both the base and high demand scenarios, New England could face significant reliability issues and high costs due to gas pipeline capacity constraints. For the base and high demand scenarios, the report recommended that a cross-regional natural gas pipeline would present the highest benefits to New England consumers compared to other options such as importing energy from Canada. The report recommends the construction of a cross regional pipeline as a long-term solution and demand response and LNG purchases as short-term solutions. In the low demand scenario, which assumes flat or declining natural gas use, new natural gas infrastructure is not needed due to gains in energy efficiency and increases in renewable energy. The report recommends building no new infrastructure in the low demand scenario.

6. ENERGY POLICY IN NEW ENGLAND

The New England states are at least partially politically united on the issue of energy through the New England Governors' Conference (NEGC/ECP). The 2001 NEG/ECP Climate Action Plan set a goal for emissions reduction in the electricity sector: 20 percent by 2025.[64] To do this, the Plan recommended a combination of new renewable energy sources, as well as more efficient fuels, such as natural gas.[65] In addition to this regional effort, each New England state has adopted its own goals to approach energy in the context of climate change.

The Maine legislature passed a law in 2003 that set statewide emission reduction goals and required the Department of Environmental Protection to create a Climate Action Plan (CAP) by the following year.[66] In agreement with the NEG/ECP Climate Action Plan, the Maine law set the short-term goal of reducing greenhouse gas emissions to 1990 levels by 2010, 10 percent below the 1990 levels by 2020, and 75 to 80 percent below current

levels over the long-term.[67] The CAP totaled 54 policy strategies toward these goals, including promoting the development of renewables, promoting more efficient fuel sources (Natural Gas as a "bridge fuel") and strengthening energy efficiency standards and emissions regulations.[68]

Massachusetts adopted its Climate Protection Plan in 2004, which established the goal of reducing 2020 emissions to 10 percent below 1990 levels. The 2008 Global Warming Solutions Act, signed by Governor Deval Patrick, made the state's emission reduction targets more stringent by mandating 25 percent reductions by 2020 and 80 percent by 2050.[69]

Rhode Island convened an inter-agency Greenhouse Gas Stakeholder Project in 2001. The group created a statewide Climate Action Plan the following year, which restated the emissions reductions goals in the NEG/ECP Plan with state□specific strategies toward Rhode Island's achievement of the targets. [70]

The state of Connecticut embarked upon creating a statewide Climate Action Plan with the 2004 Public Act No. 252 (S.595), which advocated lower emissions. The State's 2005 Climate Change Action Plan contains 55 recommended action. The Plan's foremost recommendation was to increase the amount and accessibility of electricity generated by renewable fuels. Natural Gas is viewed as more of a bridge fuel, rather than a "permanent" solution.[71]

Vermont Governor Jim Douglas established the Governors' Commission on Climate Change in December 2005, by executive order.[72] This Commission assisted in the 2006 approval of an act which set emission reduction goals.[73]

6.1 Natural Gas Specific New England State Legislation

In 2012, Maine passed "An Act to Expand the Availability of Natural Gas to Maine Residents" which authorizes the Finance Authority of Maine to issue bonds for energy distribution system projects that expand the supply of natural gas in the State. The authority is authorized to issue a certificate of approval to an applicant for a natural gas project only if the applicant contributes at least 25 percent of the expected cost of the project. The bill also establishes in statute minimum and maximum capital reserve requirements for bonds that are issued for natural gas projects.[74] The following year, a bill proposing to establish the Maine Energy Cost Reduction Authority did not pass. The MECRA would potentially have the responsibility of entering into contracts to procure and resell natural gas pipeline capacity and electric energy and capacity, to identify and designate corridors the construction of natural gas transmission pipelines and to enter into long-term contracts for the use of natural gas pipeline corridors through the development of natural gas pipelines.[75]

Recent legislation in Massachusetts has focused on the environmental safety and efficiency aspect of natural gas pipelines, as in 2014, the legislature passed a law that requires utilities to improve their gas leak inspection protocols and establish a timeline for fixing all hazardous leaks immediately throughout Massachusetts. This legislation was following a study which showed that in Massachusetts, natural gas consumers paid up to $1.5 billion from 2000 to 2011 for gas that never made it to them because of leaks.[76]

In 2012, Vermont became the first state to ban hydraulic fracturing to extract oil or natural gas. Hydraulic fracturing, or fracking, extracts natural gas or oil from deep in the ground by underground explosions and injections of water, sand and chemicals under high pressure into dense rock formations such as shale. Fracking has taken off in recent years, as the industry has developed the capacity to drill at depth horizontally for thousands of feet. As a result, natural gas supplies in the U.S. have boomed and the price is at a 10-year low, down 80 percent from a peak in June 2008.[77]

This past year, the Rhode Island General Assembly approved legislation that authorized the Division of Public Utilities and Carriers (DPUC) and the Office of Energy Resources (OER) to participate in a regional six-state effort to develop and issue open and competitive solicitations for infrastructure projects and clean energy resources.[78] Two of the more prominent plans under discussion are bringing hydropower to the New England states and increasing incoming supplies of natural gas to address the fact that the region is being serviced by pipelines that are at or near capacity.[79]

In 2013, Connecticut passed legislation expanding Connecticut's natural gas distribution system to provide an alternative to costlier heating oil. The state's regulated natural gas companies have filed a proposal with state regulators outlining plans to connect 280,000 customers over 10 years. Currently, state lawmakers are debating a ban on storing or recycling wastewater generated as a byproduct of gas exploration.[80] As the New England region grows increasingly dependent on natural gas for electricity generation, as well as works towards a long-term goal of reducing emissions, the states clearly see a future of working together to fulfill the energy needs of the region. The governors of the six New England states in 2013 signed an agreement for the regional energy infrastructure initiative that seeks to accelerate regional cooperation on expanding renewable energy and energy infrastructure in region. The agreement emphasizes that the region's electric and natural gas systems have become progressively interdependent, creating a need for cooperative investments in energy efficiency, natural gas pipelines and electric transmission.[81]

7. CONCLUSION

The energy mix in New Hampshire has changed dramatically in the past decade. Natural gas is increasingly being used for electricity generation and home heating. As a result of the increase in natural gas consumption, measures need to be taken to reduce strain on

natural gas pipelines and decrease vulnerability to price fluctuations. Actions that would have an impact in the short-term include incentivizing energy efficiency, repairing existing pipelines, and expanding renewable energy. If it is certain that natural gas consumption in New Hampshire will continue to increase in the long-term, it is worth evaluating the construction of a cross-regional pipeline. Fuel switching from fuel oil and coal to natural gas presents environmental benefits, but natural gas still has significant environmental impacts, in addition to its impact on climate change. In summary, New Hampshire's energy mix has undergone major shifts and action is required by policymakers to address these changes and ensure the necessary infrastructure is in place to support a stable supply of energy.

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