STATE OF NEW HAMPSHIRE
BEFORE THE
PUBLIC UTILITIES COMMISSION

Docket No. DG 23-067

Liberty Utilities (EnergyNorth Natural Gas) Corp. d/b/a Liberty
Distribution Service Rate Case
Keene Gas Delivery System

DIRECT TESTIMONY

OF

JACOB DROUSE,

MORGAN MACGREGOR,

AND

HEATHER M. TEBBETTS

July 27, 2023

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TABLE OF CONTENTS

LIST OF ATTACHMENTS

LIST OF TABLES

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I. INTRODUCTION

Q. Mr. Drouse, please state your full name, business address, position, and responsibilities.

A. My name is Jacob Drouse, and my business address is 130 Elm Street, Manchester, New Hampshire. I am employed by Liberty Utilities Service Corp. ("LUSC") as an engineer for Liberty Utilities (EnergyNorth Natural Gas) Corp. d/b/a Liberty ("Liberty EnergyNorth" or the "Company"). In this role I am responsible for project engineering and plant management for Liberty EnergyNorth, including its Keene Division. LUSC and Liberty EnergyNorth are direct subsidiaries of Liberty Utilities Co. ("Liberty") that owns and operates electric, natural gas, water, and wastewater utilities in thirteen states in the United States.

Q. Please describe your educational and professional background and training.

A. In 2014, I received a Bachelor of Science in Mechanical and Electrical engineering from Roger Williams University.

Before I joined Liberty EnergyNorth in October 2022, I was a natural gas engineering design consultant with Sanborn, Head & Associates ("Sanborn Head") for seven years where I designed upgrades to existing liquified natural gas ("LNG"), compressed natural gas ("CNG"), and renewable natural gas ("RNG") plants as well as participated in Front End Engineering and Design ("FEED") and Hazard and Operability Analysis for existing and proposed facilities.

Q. Have you previously testified before the New Hampshire Public Utilities Commission ("Commission")?

A. No, I have not.

Q. Ms. Tebbetts, please state your full name, business address, position, and responsibilities.

A. My name is Heather M. Tebbetts, and my business address is 15 Buttrick Road Londonderry, New Hampshire. I am employed by LUSC as the Director of Business Development, responsible for strategic growth and technology opportunities for Liberty EnergyNorth in New Hampshire.

Q. Please describe your educational and professional background.

A. I graduated from Franklin Pierce University in 2004 with a Bachelor of Science degree in Finance. I received a Master of Business Administration from Southern New Hampshire University in 2007.

Prior to joining Liberty in October 2014, I was employed by Public Service Company of New Hampshire ("PSNH") as a Senior Analyst in NH Revenue Requirements from 2010 to 2014. Prior to my position in NH Revenue Requirements, I was a Staff Accountant in PSNH's Property Tax group from 2007 to 2010 and a Customer Service Representative III in PSNH's Customer Service Department from 2004 to 2007.

Q. Have you previously testified before the Commission?

A. Yes, I have testified on numerous occasions before the Commission.

Q. Ms. MacGregor, please state your full name and business address.

A. My name is Morgan K. MacGregor, my business address is 440 Wilsey Road, Suite 101, Fredericton, New Brunswick. I am employed by Liberty Utilities (Canada) Corp. ("LUC") as the Manager of Business Development for Regulated Investments in the East Region, and in this role, I am responsible for overseeing project engineering and new technology development for the Business Development team.

Q. Please describe your educational background and your business and professional experience.

A. I graduated from the University of New Brunswick in 2017 with a Bachelor of Science in Chemical Engineering degree. I later received a Master of Science in Chemical Engineering from the University of New Brunswick in 2021. I joined Liberty in October 2019 where I started as a Business Development Professional in New Brunswick before being promoted to my current role of Manager of Business Development for Regulated Investments in May 2022. Prior to joining Liberty, I was employed by Enbridge as a Senior Analyst of Energy Solutions in New Brunswick from May 2018-October 2019.

Q. Ms. MacGregor, have you previously testified in regulatory proceedings before the Commission?

A. No, I have not.

II. PURPOSE OF TESTIMONY

Q. What is the purpose of your testimony?

A. The purpose of our testimony is to describe the existing propane-air facility that serves the Company's Keene Division, explain why that facility needs to be replaced, and provide details of the Company's proposed replacement of the propane-air facility and the conversion of Keene customers from propane-air to natural gas. This conversion is necessary to ensure that the Company will be able to provide Keene customers with safe and reliable service given the current age and state of the system.

III. KEENE GAS DELIVERY SYSTEM AND GAS PRODUCTION PLANT

Q. Please describe the Keene propane-air facility.

A. The Keene distribution system, which Liberty EnergyNorth purchased from Iberdrola USA in January 2015, is a stand-alone propane-air system constructed in the late 1800s and serves approximately 1,250 customers in Keene. The delivery system consists of gas mains ranging in size from 2-inch to 12-inch. There is a low-pressure system, serving approximately 1,150 mostly residential customers, and a 5-psig high-pressure system, serving approximately 100 mostly commercial customers.

The delivered gas is unique -- a mixture consisting of approximately 30% propane vapor and 70% air. Although once common, the Keene system is one of only two propane-air systems left in the country, the other being on Catalina Island off the coast of California.

The propane-air plant itself, where the propane is stored, mixed with air, and injected into the distribution system, is located at 207 Emerald Street. The plant is owned by Keene

Propane Corporation and is leased to Liberty EnergyNorth. Liberty EnergyNorth operates and maintains the plant. Liberty EnergyNorth acquired the distribution system and the lease of the Keene facility in 2015 from Iberdrola, as approved by the Commission in Docket No. DG 14-155. *See* Order No. 25,736 (Nov. 21, 2014).

IV. THE NEED TO REPLACE THE KEENE PROPANE-AIR FACILITY

Q. Please explain why the Company is planning to replace the Keene propane-air facility.

A. First, the Keene propane-air plant is obsolete. The facility and its core components date back to the late 1800s and have been modified and upgraded many times over the ensuing decades. As a result, the current facility consists of components of different vintages assembled into a unique whole. This renders repair and maintenance of the facility a challenge and limits the ability to expand and modernize.

Second, the Keene facility is in downtown Keene, only yards from a restaurant, a health care facility, and other locations easily accessible to the public. This location limits the scope of facility improvements and forecloses the Company from constructing a new facility as substantial improvements or a new facility could never meet modern building and safety codes and setback requirements that would apply to new construction given the small lot and proximity to public places.

Third, the Company does not own the Keene facility or the land on which it sits. The lease with the Keene Propane Corporation, which was executed prior to Liberty EnergyNorth ownership, expires in less than three years, on February 28, 2026, and

allows for three additional years through February 2029. Liberty EnergyNorth currently must vacate the Keene facility in February 2029. The Company currently does not pay any rent for the facility, which is a benefit obtained through its 2015 acquisition, but Liberty EnergyNorth will pay rent for the three extra years, as follows:

Table 1. Annual Lease Rent at 207 Emerald Street

Lease Term	Annual Rent
3/1/2026 - 2/28/2027	$71,300
3/1/2027 - 2/29/2028	$73,400
3/1/2028 - 2/28/2029	$75,600

Finally, propane-air is an obsolete fuel and the system delivering it is well beyond its useful life. As discussed above, the Keene system is one of only two propane-air systems left in the country.[1] As a result, manufacturers have long stopped making furnaces, stoves, and other appliances capable of burning propane-air; new appliances are designed to burn natural gas or propane. Thus, when a Keene customer buys a new furnace or other gas appliance, the Company must travel to the customer's home and modify the appliance so that it can burn the propane-air. This retrofit voids the manufacturer's warranty and exposes Liberty EnergyNorth to unnecessary liability for customer-owned, behind-the-meter appliances.

[1] *See* Order No. 21,309, 79 N.H.P.U.C. 426 (Aug. 5, 1994) (approving the discontinuation of propane-air service in Claremont, New Hampshire, leaving Keene as the last propane-air service in New Hampshire).

Q. Have there been any incidents at the facility since Liberty EnergyNorth's 2015 acquisition that support retirement of the facility?

A. Yes. There have been several incidents since Liberty EnergyNorth acquired the Keene system. The most significant incidents follow:

- In December 2015 a power outage causing the "blower" system to fail which caused a rich air-gas mixture (more propane than specified) to enter the pipeline system resulting in appliances shutting down and giving rise to increased risk of carbon monoxide within homes because of the inability for customer appliances and equipment to properly burn the rich propane-air mix. This incident required the shutdown of the entire Keene system, a substantial emergency response, and a multi-day restoration effort. *See* the report of the Commission's Safety Division and related documents filed in Docket No. DG 15-517.
- In February 2016, a similar incident related to the failure of the blower system occurred, although causing a lesser impact on the system.
- In October 2021, a mechanical issue at the propane-air production facility not related to the blowers (as they had been shut down in 2019) caused a pressure drop requiring a safety shut down of the system and again triggered multi-day restoration of gas service.

The Keene system has experienced other isolated incidents arising from problems related to the age of the system and the complications arising from the serial upgrades made over the years.

Q. Has the Company taken steps to correct and replace safety controls/processes, equipment, and plant reliability?

A. Yes. The Company has taken a number of steps to improve the facility in response to incidents, including the 2015 incident and in response to constant inspections and evaluations by the Company. These steps have allowed the facility to continue to operate, but these are short term solutions that do not address the fundamental issues listed above that support retirement of the plant.

Q. Did the Company seek outside expertise to assess the viability of continued operation of the Keene facility?

A. Yes. In 2020 the Company hired Sanborn Head to perform an independent assessment of the Keene facility. Sanborn Head is a respected national engineering firm with expertise gained through working on all aspects of propane air systems for multiple utility and industrial-scale customers, including vaporization, storage, and mixing. Sanborn Head evaluated the facility's equipment and the risk and impact of failure of each component of the facility, considering equipment age, equipment redundancy, obsolescence, and performance.

Q. What did Sanborn Head conclude?

A. As stated in its report:

> Sanborn Head concluded capital equipment upgrades, additional evaluations, and subsequent improvements are required in the near term (5 – 7 years) to allow the Facility to continue to operate safely and reliably. Additionally, considering the Facility's compact layout, LUNH as a lessee of the property and proximity to the current community, it is not feasible to

> upgrade the Facility other than for those recommendations which increase the Facility's safety and reliability in the near-term. Therefore, Sanborn Head recommends the Facility be phased out after year 7 or sooner. This interim phase will give LUNH time to plan for replacement of the Facility whether in the form of a propane-air baseload facility or some combination of natural gas and renewable natural gas.

Facility Assessment, Propane-Air Facility, Keene, New Hampshire, dated October 8, 2020, at 4 (emphasis added), a copy of which will be filed as a supplemental attachment to this testimony during this proceeding.

V. THE STEPS TAKEN TO DETERMINE THE BEST ALTERNATIVE TO THE KEENE PROPANE-AIR SYSTEM

Q. What did the Company do in response to the Sanborn Head report?

A. In many ways the Sanborn Head report confirmed what the Company already knew -- that the Keene propane-air facility needed to be replaced and that it is time to proceed with a plan to make that a reality. The Sanborn Head report crystalized that understanding and supported the efforts that were already underway toward replacing the propane-air facility.

Specifically, the Company had already begun planning for the conversion of the Keene system from propane-air to natural gas in 2014 at the same time the Company was acquiring the Keene system. See Transcript of October 30, 2014, hearing in Docket No. DG 14-155, at 25–26.1.

Q. Is natural gas available to the Keene system?

A. Yes. In 2016 and 2017, following the incidents described above, the Company began work on a new CNG system that would enable the Company to retire the troublesome blower system, and would be a first step toward converting the Keene system to natural gas. The CNG facility received final Commission approval in 2019 and began servicing customers in October of that year.

Q. Please provide a brief description of the CNG system.

A. The existing CNG decompression facility is located on Production Avenue, which is on the outskirts of Keene and the end of a dead-end road. It has room for up to three CNG transport trailers to be parked on site. These transports arrive with the CNG compressed to pressure of about 3500 psig. This high-pressure gas is then reduced to 60 psig through a system of pressure regulators and heating equipment that comprise the CNG facility. Currently, the existing CNG facility feeds approximately 22 customers in the adjacent Monadnock Market Place and nearby Key Road.

Q. Is the CNG system sufficient to serve all the Company's Keene customers?

A. No. The existing CNG system was brought online, first, to allow the Company to retire the "high pressure" part of the propane-air system that relied on blowers. The Company sought to retire the part of the system that relied on blowers because a failure of the blower caused the major outage in December 2015 and some of the other incidents. The new CNG system was also the first small step in converting the Keene system to natural gas. However, since the current CNG system was designed and built to serve the two

dozen existing customers on the high-pressure system, mostly at the Monadnock Marketplace, it does not have the capacity to serve the balance of the Keene system.

The new facility that is the subject of this testimony will be able to receive natural gas in the form of CNG and LNG. Although CNG and LNG are both natural gasses, a unit of LNG contains three times more natural gas than the same unit of CNG. The new facility will rely primarily on deliveries and storage of LNG because LNG requires fewer trucks and smaller storage tanks than CNG. The CNG portion of the new facility will supplement the LNG and will be the method for introducing RNG, which is most often compressed, not liquified.

VI. THE DECISION TO PROCEED WITH AN LNG/CNG FACILITY

Q. What steps has the Company taken in response to the condition of the Keene facility and the 2020 Sanborn Head report?

A. In 2021, the Company met with Keene officials, including the Mayor, City Manager, and Director of Public Works, to discuss transitioning Keene to natural gas. The discussion was met with positive feedback from the officials, who were eager to engage and assist in the conversion.

Also in 2021, Liberty EnergyNorth engaged GHD, a global engineering consultant, to assist in identifying the appropriate transition and timeline from the existing propane-air system to a cleaner, more reliable, and economic fuel and system that supports it. Through this consultation, the project scope was identified and broken into the following

three stages. At the time of this filing, Liberty EnergyNorth has completed all three stages.

Table 2. Stages of Project

Stages of Project	
Stage 1:	Assessment of fuel options for Keene
Stage 2:	Deeper analysis of CNG/LNG and land evaluation
Stage 3:	Detailed FEED and Environmental Site Assessments on location & CNG/LNG solution

Although Liberty EnergyNorth had already installed the CNG system for the commercial customers in and near the Monadnock Marketplace, this represented a very small portion of the Company's 1,250 customers. Therefore, in the Stage 1 study, the Company and GHD took a step back and evaluated all fuels that could be delivered through the Keene system.

Q. What gas supply options were considered for Keene?

A. Liberty EnergyNorth and GHD evaluated propane, natural gas (CNG, LNG, and RNG), and hydrogen.

CNG is natural gas that has been compressed to allow for easier and more economical truck transportation and more efficient storage. Traditional natural gas can be compressed into CNG and RNG, defined below, is also most often transported and stored in compressed form.

RNG is a sustainable and low carbon alternative to conventional natural gas and is sourced from farms, landfills, food waste sites, and wastewater treatment facilities.

When organic matter breaks down it produces methane, the primary component of natural gas. RNG is produced by capturing the methane at the source, which would have otherwise been emitted into the atmosphere. Once captured, the methane is purified to pipeline quality standards, and is interchangeable with conventional natural gas. Depending on the source, RNG can have a carbon intensity ("CI") score as low as -400 gCO2e/MJ, compared to traditional natural gas' CI score of 70 gCO2e/MJ. The lower the CI score, the less the CO_2 released to the atmosphere during combustion. RNG is most often transported and stored as in the same manner as CNG.

Hydrogen, the most abundant chemical substance in the universe, is a versatile gas that can be produced from all energy sources. Green hydrogen is produced using electrolysis, a process that splits water molecules into hydrogen and oxygen using electricity. Hydrogen can be used as an alternative to natural gas, or it can be blended into the natural gas system. When consumed, hydrogen produces zero emissions

Q. How were the various gas supply options evaluated?

A. The various gas supplies were evaluated based on several criteria including cost per MMBTU, the fuel carbon intensity, ease of implementation with the current distribution network, and the ability to allow for alternative renewable fuels.

Q. Please share the results of the evaluation.

A. GHD performed three analyses for the Company. The first analysis entailed determining supply options, the second provided a deeper analysis of CNG/LNG, and the third provided the design and costs. Please see Attachment JD/MM/HT-1 for the supply

options and Attachment JD/MM/HT-2 for the design and cost analysis performed by GHD.

Q. What makes a natural gas solution the best solution for Keene?

A. Liberty EnergyNorth's consultant, GHD, indicated that the conversion to natural gas in the form of both LNG and CNG is consistent with the Company's and the City of Keene's energy transition narrative with the desire to deliver clean, economic, reliable, and safe energy. The conversion to natural gas will also provide the ability to co-blend RNG as a method of decarbonizing and allows for the longer-term blending of hydrogen from renewables such as solar, as another pathway towards meeting the City of Keene's goal that 100% of thermal energy and energy used for transportation will come from renewable energy sources by the year 2050.

GHD has indicated the following with their research:

- Clean Energy: Natural gas represents a more direct and economical path toward long-term environmental goals than propane, with natural gas, renewable natural gas having lower Carbon Intensity, as demonstrated by GHD's analysis as shown in the Summary Comparison of Conversion Scenarios for Zone 1 in Attachment JD/MM/HT-1. The availability of natural gas in Keene may also encourage residents and businesses who now use oil to consider converting to the more affordable and less carbon-intensive fuel.
- Economical Energy: As a "manufactured gas," propane is highly influenced by spot pricing, plus weather supply and logistics issues. Fifty percent of propane is

still produced via petroleum refining. As refiners move away from fossil fuels and towards electrification this could result in even more volatility in propane pricing. As a result, building a dedicated propane system may have adverse financial impacts on customers, including increased energy bills. More importantly new customers will most likely purchase high-efficiency appliances that will not be compatible with propane and will require equivalent natural gas heating values for optimum efficiency.

- Avoidance of Stranded Costs: Looking at key commercially viable energy transition options, propane fails to offer competitive value against alternative options. GHD's research indicates that clean energy moved by pipelines will be primarily based on natural gas transitioning to renewable natural gas and eventually hydrogen. Investing in a propane system has the highest potential risk of stranding those assets as most gas utilities pursue RNG/Hydrogen.

As a result of the assessment, GHD recommended that Liberty EnergyNorth continue to investigate the conversion from propane-air to natural gas, followed by a near-term and long-term schedule for blending RNG and hydrogen produced from renewable sources such as solar as an opportunity to meet Keene's long-term decarbonization goals. GHD did not recommend that Liberty EnergyNorth replace the old Keene propane-air system with a new propane system.

Q. Did Liberty EnergyNorth adopt that recommendation?

A. Yes, Liberty EnergyNorth agrees that a new natural gas facility that can accommodate both LNG and CNG is the best option for replacing the propane-air facility.

Q. Please describe what such a facility would entail.

A. The new facility will be designed to offload LNG, CNG, and RNG from tanker trucks into on-site storage facilities and directly into the distribution system. It will be a baseload facility sized to provide fuel during the most extreme winter conditions. The facility will include the necessary storage tanks, offload system, vaporizers, and related equipment, and the facility will have the necessary redundancy and industry standard automation, control, and monitoring to best enable the Company to continue to provide safe and reliable service[2].

Q. Having decided to proceed with an LNG/CNG facility, what was the next step?

A. Liberty EnergyNorth proceeded to Stage 2 of the project, which was a study with GHD where they performed a review of a previously developed conceptual design and evaluated potential sites for a new LNG/CNG facility in Keene that could replace the existing propane-air facility.

Stage 2: Deeper analysis of preferred LNG/CNG option and land evaluation.

[2] RSA 374:1 states, "Every public utility shall furnish such service and facilities as shall be reasonably safe and adequate and in all other respects just and reasonable."

In Stage 2, GHD completed a review of a previously developed basis of design and conceptual design for a natural gas facility in Keene. The consultant obtained updated quotations for major equipment components and considered industry cost indexes to adjust for current market conditions. The updated costs were used to provide a revised Opinion of Probable Construction Costs ("OPCC") for the facility to give an estimate of indicative cost for the project. In the same work, Liberty EnergyNorth also identified three possible locations for a new facility and each location has been evaluated as an option for construction of the new facility. GHD developed a siting evaluation matrix to aid in the decision-making process for the selection of the preferred site. This then led Liberty EnergyNorth to Stage 3.

Stage 3: Detailed Front-End Engineering and Design and Environmental Site Assessments on preferred locations and LNG/CNG solution

GHD was engaged to complete the necessary engineering design as provided in Attachment JD/MM/HT-2 to adequately define the project scope and complete a FEED and associated cost estimate. GHD produced a total installed cost estimate with a level of accuracy in accordance with a Class 3 estimate, as defined by the Association of the Advancement of Cost Engineering International. Additionally, since the location for the new facility was still undecided after Stage 2, a key aspect of Stage 3 was site selection from the three most viable sites, including Environmental Site Assessments.

VII. PROPOSED LNG/CNG FACILITY

Q. Please summarize Liberty EnergyNorth's plan for the new LNG/CNG facility.

A. Based on the work with GHD described above, Liberty EnergyNorth plans to continue its design and then will construct, commission, and operate the new LNG/CNG plant to replace the existing propane-air plant in Keene. The proposed location for the project is on Production Avenue, will serve all the existing Keene customers, and will include the ability to add capacity for growth. This system conversion will also include converting all customer equipment so that it can burn natural gas.[3]

Q. Please explain the detailed cost estimates for the project as provided in Attachment JD/MM/HT-2.

A. The following table outlines the estimated project costs associated with the construction of a new CNG/LNG facility and conversion of the Keene system from propane-air to natural gas.

[3] Since appliance manufactures do not make equipment that can burn the propane-air mixture delivered in Keene, the Company currently must adjust every customer's furnace, stove, and other gas appliance so that it can operate on the propane-air (which voids manufacturer warranties and exposes the Company to substantial risk). Thus, when the Company converts to natural gas, the Company must again convert existing appliances back to their original ability to consume natural gas.

Table 3. Keene Project Cost Breakdown

Direct Costs	
Equipment	$4,887,122
Piping	$2,074,378
Civil	$1,415,879
Steel	$26,710
Instruments	$1,513,655
Electrical, Insulation, Paint	$685,572
Total	$10,603,316
Indirect Costs	
Const Equip & Indirects	$1,608,315
Const Mgt, Staff Suprv.	$303,627
Freight	$302,682
Engineering	$1,378,431
Contingency	$1,845,528
	$5,438,583
GHD Project Total	$16,041,899
Overheads on Contract Work	$5,678,548
Land Acquisition	$2,500,000
Total Project Costs	$24,220,447

Q. How was the estimated cost of the natural gas conversion determined?

A. GHD completed the necessary engineering design to adequately define the project scope and complete a FEED and associated cost estimate. GHD produced a total-installed-cost (TIC) estimate with a level of accuracy in accordance with a Class 3 cost estimate, having an accuracy range of +/-15%.

Q. How is Liberty EnergyNorth seeking to recover costs?

A. Liberty EnergyNorth proposes to recover all costs associated with the project through distribution rates[4] because the system is not connected to a pipeline and thus all the new system will be used for pressure stabilization. It is appropriate to include the costs of pressure support in distribution rates, as has been approved for the Company's Tilton facility. In Liberty EnergyNorth's most recent rate case, Docket No. DG 20-105, the Commission approved in distribution rates all the Tilton facility's costs that are attributable to pressure support, as determined by the functional cost of service study.

Q. Will customers be notified of the potential conversion of the system?

A. Yes. Once approved, the Company will work with the City of Keene and its customers to ensure that proper communication is given regarding the system's conversion to natural gas and as the Company converts customers over the coming years as discussed further below.

Q. Will the proposed conversion to natural gas allow for growth potential in Keene?

A. Yes. This project will allow for growth across the city of Keene with new residential, commercial, and industrial customers. As discussed above, the existing propane-air plant did not have the capacity, nor the ability to increase capacity, to add new customers. There are many Keene residents and businesses that now burn bottled propane, oil, and wood who could become Liberty customers. Liberty has estimated it could triple its

[4] In the Company's 2017 rate case, the Commission approved Liberty EnergyNorth's request to consolidate the Keene Division distribution rates with the distribution rates of the rest of the Liberty EnergyNorth, Order No. 26,122 (Apr. 27, 2018),

throughput by adding only four anchor customers. The Company could also add smaller customers as it builds out the infrastructure necessary for anchor customers.

Q. Please discuss the impact of the conversion to customer gas appliances, including if the utility will be inspecting and adjusting those appliances for the new conditions.

A. The conversion from propane-air to natural gas will require all gas fired appliances owned by Liberty EnergyNorth customers to be converted or replaced to burn natural gas. Due to the number of customers affected by the project, the conversions will take place in phases with customer equipment being converted as their respective portion of the distribution network is converted to natural gas.

VIII. LIBERTY ENERGYNORTH'S TIMELINE FOR THE NEW KEENE FACILITY

Q. What is the Company's timeline for the new Keene facility?

A. The Company has developed the following short-, mid-, and long-term strategy to continue to serve Keene customers. Please see the following table for a breakdown of the timeline:

Table 4. Timeline for Keene Distribution System Upgrade

Two to Five Year Timeline

Stage 1: • Install new CNG/LNG facility and decommission propane-air facility

Stage 2: • Blend RNG into natural gas feed once CNG/LNG is commissioned and RNG can be obtained
-> Maximize use competitively priced RNG

The above timeline begins with the in-service date of the new facility. That is, for the first two to five years after the in-service date, the Company will convert current customers and retire the propane-air plant.

IX. ENVIRONMENTAL, ECONOMIC, AND OPERATIONAL BENEFITS

Q. Please describe how the investment benefits the reliability, safety, and efficiency of the Company's operations.

A. As previously stated, there have been three significant incidents at the Keene facility that have resulted in the interruption of service to our customers. The Company believes that the conversion to natural gas will alleviate these incidents as they resulted from the unique nature of the propane-air plant. Natural gas is also an attractive option due to its proven reliability, availability, affordability, greater appliance efficiency, and clear pathway to emerging renewable and low-carbon energy technologies. The natural gas system is inherently resilient, and system-wide disruptions are rare. In converting the Keene system to natural gas, the Company would improve the overall dependability and reliability of gas delivery in Keene, resulting in fewer service disruptions, safety concerns, and community disturbances.

Q. Please describe the environmental benefits of the investment to the state of New Hampshire.

A. The investment will enable the conversion of the Keene facility from propane-air to natural gas and enable Liberty to serve natural gas to more customers. The added capacity will enable Liberty to provide a pathway for low and zero-carbon fuels to

replace existing fuel sources in Keene, such as wood, oil, and bottled propane. Reports of air quality issues in the Keene area due to its valley topography have been documented by New Hampshire Department of Environmental Services[5] and in fact the EPA granted Keene State College $25,000 to study air quality issues in the winter due to wood smoke[6]. The Company's new facility will have the capacity to accept new customers who now burn wood, oil, and propane, to be served with natural gas or the emerging technologies such as renewable natural gas (RNG) and hydrogen. The planned investment may encourage Keene residents and businesses who now use other fuels to convert to the more affordable and less carbon-intensive fuels that Liberty EnergyNorth can offer.

Q. Please discuss if there are any applicable emission limitations in Keene or in New Hampshire.

A. Although there are no applicable emission limitations, the transition to natural gas and subsequently RNG and hydrogen supports the City of Keene's goal of reaching net-zero carbon emissions by 2050.

[5] https://www.des.nh.gov/sites/g/files/ehbemt341/files/documents/2020-01/mam-executive-report.pdf

[6] https://www.epa.gov/system/files/documents/2022-03/keene-nh-case-study-jan-2022.pdf

Q. Does the expected value of the economic benefits of the investment to the utility's customers over the life of the investment outweigh the economic costs to the utility's customers?

A. The future-proofing benefits of a natural gas facility in Keene will create a greater long-term value proposition than a propane facility. The ability to substitute and blend natural gas with RNG and hydrogen over time offers notable asset resilience for stakeholders as it allows the investment to remain relevant as emerging technologies become the vanguard of the industry. As previously stated, GHD's research has shown that the pathway to renewable energy through pipelines will be principally based on the transition from conventional natural gas to RNG and eventually hydrogen. Though renewable propane is an alternative to conventional propane, the Company does not consider it a viable option for the city of Keene as it is not as innovative as natural gas and does not offer a direct pathway to hydrogen and other low and zero-carbon fuels consistent with industry progression. Additionally, the conversion to natural gas permits the Company to reduce overall cost of gas for Keene customers, as commodity rates for propane are historically much higher than natural gas. With these factors taken into consideration, the Company believes that the benefits of the conversion outweigh the costs.

Q. Has the company made reasonable efforts to involve local businesses in its project?

A. Yes. While identifying alternative fuel sources, the Company has consistently been mindful of local businesses, their needs, and the benefits that natural gas would have. Furthermore, the company has been in collaboration with City of Keene officials to determine the best path forward for gas distribution in Keene. The Company believes

that the conversion to natural gas aligns with the goals and ambitions of the City of Keene.

X. CONCLUSION

Q. Does this conclude your testimony?

A. Yes, it does.

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