COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF PUBLIC UTILITIES

Petition of NSTAR Gas Company d/b/a Eversource Energy for Approval of a Firm Transportation Agreement with Tennessee Gas Pipeline Company, LLC and a Winter Peak Service Agreement with ENGIE Gas & LNG, LLC, pursuant to G.L. c. 164, § 94A.

Direct Testimony of
Elizabeth A. Stanton

On Behalf of
Conservation Law Foundation

Regarding Consistency of Petition with Company Portfolio Objectives, Adequacy of Alternatives Considered, and Consistency with State Environmental Policies

February 14, 2018
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1. INTRODUCTION AND QUALIFICATIONS

Q. Please state your name, title, and employer.
A. My name is Elizabeth A. Stanton, and I am the Director and Senior Economist of the Applied Economics Clinic of the Global Development and Environment Institute at Tufts University, 44 Teele Avenue, Somerville, MA 02144.

Q. Please describe the Applied Economics Clinic.
A. The Applied Economics Clinic is a 501(c)(3) non-profit consulting group housed at Tufts University's Global Development and Environment Institute. Founded in February 2017, the Clinic provides expert testimony, analysis, modeling, policy briefs, and reports for public interest groups on the topics of energy, environment, consumer protection, and equity, while providing on-the-job training to a new generation of technical experts. The Applied Economics Clinic's mission is: (1) To provide low cost and (when we receive foundation grants) pro bono expert services to public interest groups on the topics of energy, environment, consumer protection, and equity; (2) To train the next generation of expert technical witnesses and analysts by providing applied, on-the-job learning experiences to graduate students in related fields; and (3) To work proactively to support and promote diversity in the fields of economics, engineering, math and sciences.

Q. Please summarize your professional and educational experience.
A. I have more than 17 years of professional experience as an environmental economist. I have submitted expert testimony in Massachusetts, Vermont, New Hampshire, Illinois, Minnesota, Indiana, and several federal dockets; and I have authored more than 140 reports, policy studies, white papers, journal articles, and book chapters on topics related to energy, the economy, and the environment. Before founding the Applied Economics Clinic, I was a Senior Economist at Synapse Energy Economics where I led studies examining environmental
regulation, cost-benefit analyses, and the economics of energy efficiency and renewable energy.

Prior to joining Synapse, I was a Senior Economist with the Stockholm Environment Institute’s (SEI’s) Climate Economics Group, where I was responsible for leading the organization’s work on the Consumption-Based Emissions Inventory (CBEI) model and on water issues and climate change in the western United States. While at SEI, I led domestic and international studies commissioned by the United Nations Development Programme, Friends of the Earth-U.K., and Environmental Defense.

My articles have been published in *Ecological Economics*, *Renewable Resources Journal*, *Environmental Science & Technology*, and other journals. I have also published books, including *Climate Economics: The State of the Art* (Routledge, 2013), which I co-wrote with my colleague at Synapse, Dr. Frank Ackerman. I am also coauthor of *Environment for the People* (Political Economy Research Institute, 2005, with James K. Boyce) and coeditor of *Reclaiming Nature: Worldwide Strategies for Building Natural Assets* (Anthem Press, 2007, with Boyce and Sunita Narain).

I earned my Ph.D. in economics at the University of Massachusetts-Amherst, and have taught economics at Tufts University, the University of Massachusetts-Amherst, and the College of New Rochelle, among others. My curriculum vitae is attached as Exhibit CLF-EAS-2.

Q. **On whose behalf are you testifying in this case?**
A. I am testifying on behalf of the Conservation Law Foundation.

Q. **Have you testified previously in this docket?**
A. No, I have not.
Q. What is the purpose of your testimony?

A. The purpose of my testimony is to provide an independent, third-party review of the Petition filed by NSTAR Gas Company d/b/a Eversource Energy (Eversource or the Company) to assess its consistency with the Company’s portfolio objectives, the adequacy of alternatives considered, and its compliance with the Massachusetts Global Warming Solutions Act (GWSA).

Q. How is your testimony organized?

A. My testimony is organized as follows:

1. Introduction and Qualifications.
2. Consistency with the Portfolio Objectives Established in the Company’s Supply Plan.
3. Comparison to the Range of Alternatives Reasonably Available to the Company and its Customers.

2. CONSISTENCY WITH THE PORTFOLIO OBJECTIVES ESTABLISHED IN THE COMPANY’S SUPPLY PLAN

Q. Have you reviewed the most recently approved FSP for Eversource?

A. Yes, I have reviewed DPU 16-40, Eversource’s FSP filed in March 2016 and approved in March of 2017.

Q. Please describe the portfolio objectives established in Eversource’s 2016 FSP.

A. In its 2016 FSP, Eversource describes portfolio objectives of providing gas resources that are in “best interests of its customers and result in a reliable, least cost, long-range supply and capacity portfolio to meet the Company’s forecasted firm demand” (DPU 16-40, Initial Filing, at p.1), are “reviewable, appropriate, and reliable” (p.2-3), and “ensure system safety, integrity and reliability.” (p.11).
Q. Have you reviewed Eversource’s most recently approved Initial Filing in this docket (DPU 17-175)?

A. Yes.

Q. Please describe the portfolio objectives established in Eversource’s 2017 Initial Filing.

A. The testimony of Eversource witness Eric B. Soderman describes Eversource’s portfolio objectives as a resource portfolio “that is cost-effective and provides valuable reliability, flexibility and diversity” (Ex. ES-EBS-1 Revised 12.6.17, at p. 37).

Q. Do Eversource’s portfolio objectives depend on increased supply capacity?

A. Eversource’s portfolio objectives do not necessarily depend increased supply capacity. Eversource’s portfolio objectives depend on selection of the most cost-effective set of supply and demand resources that together are sufficient to meet natural gas demand. Whether or not this optimal set of resources includes higher supply capacity is a matter to be established through modeling and demonstrated in the Company’s filings to the Department.

Figure 1 presents Eversource’s expected “shortfall” as predicted in its past filings to the Department. The Company’s “shortfall” is the difference between its expected natural gas requirements or needs in a given year and its expected gas supply. The shortfalls shown in Figure 1 are for the “design day” and are given as a percentage of the same year’s design day expected gas requirements.
In reviewing Figure 1, it is apparent that Eversource’s expected natural gas shortfall for 2017 and 2018 differed substantially in its 2014, 2016 and 2017 filings.

Q. Does Eversource expect its proposed contracts with ENGIE for new supply to resolve its shortfall?

A. Yes. Based on the information presented by the Company in its initial filing in 17-175, Eversource expects its proposed contracts with TGP and ENGIE for new supply to resolve its shortfall (see Figure 1 in which the Company’s shortfall with the new contracts is shown in purple).

Q. Does this increased supply have other impacts on Eversource’s portfolio objectives?

A. Recall that Eversource’s portfolio objectives depend on selection of the most cost-effective set of supply and demand resources that together are sufficient to meet natural gas demand. Eversource asserts that its proposed contracts with TGP and
ENGIE for new supply will resolve its shortfall (by increasing the resources needed to meet natural gas demand). In addition, the Company appears to contend that its proposed contracts with TGP and ENGIE for new supply will render the set of supply and demand resources that includes these contracts the most cost-effective choice:

_In this case, Eversource is proposing to enter into the Proposed Contracts because the Proposed Contracts help address several key resource requirements over the long term, including but not limited to: (1) securing firm, mainline capacity to the Worcester meter station at a reasonable cost_ (Revised Petition, at p.7)

And that, in addition, the proposed TGP and ENGIE contracts would improve reliability (17-175, Revised Petition, p.7).

Q. Are Eversource’s proposed contracts with TGP and ENGIE for new supply necessary to meet the Company’s forecast of customer needs in future years?

A. It is not clear from the information provided in 17-175 whether or not Eversource’s proposed contracts with TGP and ENGIE for new supply are necessary to meet the Company’s forecast of customer needs in future years.

Q. Does Eversource demonstrate that its proposed contracts with TGP and ENGIE for new supply results in the least-cost supply and demand resource mix?

A. No. Eversource does not provide sufficient evidence to demonstrate that its proposed contracts with TGP and ENGIE for new supply result in the least-cost supply and demand resource mix.

Q. What additional evidence would Eversource need to present to demonstrate that its proposed contracts with TGP and ENGIE for new supply result in the least-cost supply and demand resource mix?
A. Eversource uses the SENDOUT model to identify the least-cost portfolio of supply and demand resources for its customers:

NSTAR Gas uses the Ventyx® SENDOUT® linear programming optimization model to calculate the least-cost dispatch of existing and incremental resources to meet the Company’s load requirements. The SENDOUT® model is a valuable tool that performs an objective economic analysis and evaluation of alternative supply and demand-side management options. The SENDOUT® model is used to:

- Analyze proposed supply contracts or changes in a supplier’s rate structure;
- Analyze proposed transportation contracts or changes in a transporter’s rate structure;
- Consider the benefits of increased or decreased capacity or supply resources;
- Optimize capacity-release decisions;
- Prepare daily, monthly, and seasonal operational dispatch plans;
- Prepare gas supply budgets and regulatory filings;
- Generate studies of avoided, or marginal cost of gas;
- Study the economic effects of changes in load. (Eversource FSP 2016, p.63)

Put simply, SENDOUT allows Eversource to input (1) its expected future demand for natural gas and (2) its potential supply resources, and from these inputs determine a least-cost supply portfolio for its customers. Essentially, SENDOUT performs a “cost effectiveness” analysis, answering the question: Given a set amount of natural gas requirement what is the least expensive way to provide reliable supply?
Gas requirements are treated as fixed, as a given. And the expected prices of natural
gas supply resources (including transportation and storage) are examined in various
combinations to find the cheapest combination of resources that will meet
customers demand.

Three obstacles exist that may prevent the type of cost-effectiveness modeling from
achieving Eversource’s portfolio objective (selection of the most cost-effective set
of supply and demand resources that together are sufficient to meet natural gas
demand):

(1) **Missing resources:** Many potential resources are not included in modeling and
are therefore not available for the model to choose as it assembles its least-cost
portfolio. For Eversource, potential resources that are left out of modeling
appear to include additional energy efficiency measures (beyond current and
planned measures) that reduce annual gas usage, efficiency measures targeted at
peak day usage, incentives to adopt electric and/or renewable space and water
heating, additional LNG and natural gas storage, thermal storage, and load
management (demand response). More demand-side measures may exist with
benefit-cost ratios higher than 1.00 (or even measures with negative benefit-cost
ratios that, when combined with the rest of Eversource’s efficiency portfolio,
result in an average benefit-cost ratio that is lower than 1.95 but greater than
1.00); these measures are not including in the SENDOUT modeling of the least-
cost supply portfolio.

(2) **Uneven playing field:** While energy efficiency from current and planned
programs are included in the Company’s expected gas requirements, these
critical demand-side resources are not treated the same as supply-side resources.
Like supply-side resources, energy efficiency measures have a net cost or
benefit associated with them that should be considered in a cost-effectiveness
analysis of a least-cost resource portfolio for Eversource’s customers.
Eversource’s benefit-cost ratio for the last three-year gas efficiency planning
period (2016-2018) was expected to be 1.95.\(^1\) That is, the benefit of the Company’s gas efficiency savings was $1.95 for every $1 of cost (or, stated another way, every therm of energy efficiency savings makes the Company’s supply and demand portfolio less expensive). It seems unlikely that any of the supply-side resources included by Eversource in its modeling have negative costs (that is, offer benefits) for every therm. The Company’s SENDOUT model is not considering the lowest cost resource among its alternatives.

(3) **Treatment of supply disruption as a resource:** While energy efficiency and non-pipeline alterative resources are not included in Eversource’s assessment of the least-cost resource portfolio, supply disruption is. The Company includes unserved customers as a supply resource with two important consequences. The SENDOUT model is selecting the resource “unserved customers” (labeled as “TGP +/-”, “AGT +/-1”, and “Net +/-”). Whether or not this selection is in preference to available pipelines supply is not clear from the materials filed in 17-175.

3. **COMPARISON TO THE RANGE OF ALTERNATIVES REASONABLY AVAILABLE TO THE COMPANY AND ITS CUSTOMERS**

**Q. Could Eversource’s portfolio objectives be served using other resources?**

**A.** Eversource’s portfolio objectives depend on selection of the most cost-effective set of supply and demand resources that together are sufficient to meet natural gas demand. Taken in its component parts:

- **Most cost-effective set of supply and demand resources:** Eversource’s selected set of resources includes both supply and demand resources. Together, these resources—both supply and demand—determine the overall cost of the

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portfolio. Least cost resource portfolios include the lowest cost resources regardless of whether these resources are on the supply or demand side. Could Eversource’s portfolio objective of providing the most cost-effective set of resources be achieved using resources other than their new supply contracts? The answer depends on cost information not provided in the Company’s 17-175 filing.

- **Sufficient resources to meet natural gas demand:** It is not clear from the information provided in 17-175 whether or not Eversource’s contract with ENGIE for new supply is not necessary to meet the Company’s forecast of customer needs in future years. Could Eversource’s portfolio objective of providing sufficient resources to meet natural gas demand be achieved using resources other than their new supply contracts? Eversource’s 17-175 filing does not provide sufficient information to demonstrate whether or not it could meet this objective by other means. Alternate resources could certainly help it meet this objective.

**Q. What alternatives to additional pipeline contracts are described by Eversource in its 2016 FSP?**

**A.** Eversource’s FSP 2016 includes both supply and demand-side alternatives to new pipeline contracts. LNG delivery, storage, and withdrawal are important supply-side alternatives while energy efficiency measures are an important demand-side alternative. More generally, Eversouce explains in its 2016 FSP:

> When there is not more than one alternative to serve the particular resource need identified by the Company, there is no basis for issuing an RFP to conduct a competitive solicitation to test market alternatives. For example, when shortfalls are substantial, the only viable alternative for meeting that need may be a pipeline expansion. Pipeline expansions are offered infrequently, so whenever either Tennessee or Algonquin offer an expansion opportunity, the Company needs to seriously
consider whether participation in the project is appropriate. For smaller shortfalls, there may be options that do not include pipeline expansions.” (Eversource FSP 2016, p.66-67)

Q. **What alternatives to additional pipeline contracts are described by Eversource in this docket (DPU 17-175)?**

A. Similarly, in its 17-175 filing, Eversource includes both LNG delivery, storage, and withdrawal and energy efficiency among its resources. With regards to the viability of additional resources other than its contract with ENGIE for new supply, the Company asserts in its 17-175 Revised Petition:

There are two viable longer-term alternatives to the ENGIE Contract available by next year, which are: (1) the “Dracut Express Project” on the TransCanada Pipeline (“TCPL”) and PNGTS pipeline; or (2) another imported LNG supplier or Eastern Canadian supply. The only other potential alternative would be to continue to rely on other third-parties to provide both supply and transportation on TGP to the Company’s city gate on a secondary basis (i.e., city-gate supply). (17-16175, Revised Petition, p.11)

Q. **Are LNG delivery, storage, and withdrawal important to Eversource’s ability to meet its portfolio objective of providing sufficient resources to meet natural gas demand?**

A. Yes. Eversource’s design day LNG supply accounts for 37 to 41 percent of total requirements, depending on the year (Ex. ES-EBS-1 (Revised 12.6.17), p.16).

Q. **What other alternative resources are available to Eversource to meet its portfolio goals?**

A. Possible alternative resources available to Eversource include additional energy efficiency measures that reduce annual gas usage, efficiency measures targeted at
peak day usage, incentives to adopt electric and/or renewable space and water heating, additional LNG and natural gas storage, thermal storage, and load management (demand response).

Q. What steps have other natural gas distribution companies taken to secure non-pipeline alternative resources?

A. In December 2017 New York’s ConEdison issued a request for proposals (RFP) for “Non-Pipeline Solutions to Provide Peak Period Natural Gas System Relief”:\(^2\)

> Con Edison has identified a need for Non-Pipeline Solutions throughout its natural gas service territory to address a nine percent shortfall in Peak Day pipeline capacity by November 2023, which is equivalent to more than 100,000 Dt on a Peak Day. The traditional solution would be the acquisition of incremental interstate pipeline capacity to address this requirement. The goal of this RFP is to identify a portfolio of opportunities that will reduce customer loads and provide new supply sources without the construction of a new pipeline, or at a minimum will be able to reduce the Company’s reliance on Delivered Services. The primary capacity constraint is for daily deliveries of natural gas into Con Edison’s service territory from upstream pipelines; the Company’s internal distribution capacity is adequate to meet fluctuations in customer Demand throughout the day. As a result, NPS projects must be able to provide Relief for a minimum of 24 consecutive hours on the coldest days of the year to be useful to Con Edison, and are more valuable if deployable for multi-day consecutive periods of cold weather. (Exhibit CLF-EAS-3 p.7)

Since as early as 2012 (see Berkshire Gas FSP 2012 and FSP 2014), Berkshire Gas has operated a load management program with the goal of reducing the need for supply resources on peak:

[T]he Company has entered into agreements with several large customers (with alternate fuel capabilities) that provide significant load management flexibility in that the Company may curtail service for a designated period of time in order to promote the efficient use of its distribution system (also referred to as “demand-side management”).

The Company has been a leader in terms of its load management initiatives. (Berkshire Gas FSP 2016, p.15)

Q. Did Eversource issue an RFP for non-pipeline alternatives in an attempt to identify and secure least-cost alternative resources?

A. To my knowledge, no.

Q. Does Eversource operate a load management program with the goal of reducing the need for supply resources on peak?

A. To my knowledge, no.

4. COMPLIANCE WITH THE GLOBAL WARMING SOLUTIONS ACT

Q. Are you familiar with the Commonwealth’s Global Warming Solutions Act, and if so, do you have an understanding of its technical requirements?

A. Yes, I am familiar with the Massachusetts Global Warming Solutions Act, and I do have an understanding of its technical requirements. The Global Warming Solutions Act, or “GWSA,” is a law passed in 2008 that requires the Commonwealth to reduce its statewide greenhouse gas emissions across all sectors and emissions sources to a level in 2020 that is no greater than 25 percent of 1990 emissions levels, or approximately 70.8 million metric tons of CO₂ equivalent
Q. In your understanding, what is required technically for a program, project, or approval to be considered consistent with the GWSA?

A. While the quantitative details will differ from case to case, assessing consistency with the GWSA as a technical matter requires at a minimum an understanding of the volume of greenhouse gas emissions that can be reasonably expected to occur as a result of the program, project or approval as well as the level of statewide greenhouse gas emissions allowed by the GWSA at that time those emissions are expected to occur. It should also normally include evidence of emission reductions that assist that Commonwealth with achieving its GWSA goals, as distinct from simply not actively harming the Commonwealth’s achievement of GWSA goals.

Q. In your opinion, does the record in this matter contain adequate evidence to enable someone to assess the greenhouse gas impacts of the proposed contracts?

A. No.

Q. Please explain.

A. In its Petition, the Company asks for permission to acquire 40,000 dekatherm (“Dth”) per day of new gas capacity from TGP and to acquire another 10,021 Dth/day of new gas capacity from ENGIE in the proposed contracts. All of that capacity, according to the Company, is designed to serve retail customers by

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4 Petition at 2.
enabling the Company to sell them gas for end-use combustion, predominantly for
space heating.5

According to the U.S. Environmental Protection Agency, “the average heat content
of natural gas is 0.1 MMBtu per therm”; “the average carbon coefficient of natural
gas is 14.46 kg carbon per mmbtu”; and the “fraction of that carbon oxidized to
CO2 during combustion is 100 percent”.6 Accordingly, the combustion of a
dekatherm of gas will result in the release to atmosphere of approximately 0.053
metric tons of CO2.7

As a result, the approval of the Petition would authorize the release into the
atmosphere of approximately 2,652 metric tons per day of CO2, or up to 1.0
MMTCO2e annually for the life of these contracts, including approximately 0.8
MMTCO2e as a result of the TGP agreement through the end of October 2038 and
potentially beyond.8

Over that same 20-year period, the GWSA requires dramatic annual reductions in
the Commonwealth’s greenhouse gas emissions, including those from the
combustion of gas for end-uses like those served by the Company. Over the life of
the proposed supply contracts, statewide greenhouse gas emissions – which include
those that will result from the proposed contracts9 – must decline approximately 2

5 Exhibit ES-EBS-1 (Testimony of Eric B. Soderman Revised 12.6.17) at 3 (contracts are required to provide
gas service to NSTAR Gas customers.”).
6 See U.S. EPA, Greenhouse Gases Equivalencies Calculator - Calculations and References (“Therms and
Mcf of natural gas”) available at: https://www.epa.gov/energy/greenhouse-gases-equivalencies-calculator-
calculations-and-references.
7 0.1 MMBtu/1 therm × 14.46 kg C/MMBtu × 44 kg CO2/12 kg C × 1 metric ton/1,000 kg = 0.0053 metric
tons CO2/therm
8 Pet. at 4 (proposed contract with TGP lasts until Oct. 31, 2038 subject to automatic extension thereafter).
9 See, e.g., Dept. of Envtl. Protection, Statewide Greenhouse Gas Emissions Level: 1990 Baseline and 2020
Business As Usual Projection Update (July 2016), Appx. C (“Massachusetts Annual Greenhouse Gas (GHG)
Emissions Inventory: 1990-2014, with Partial 2015 & 2016 Data - March 2017”) (including in “statewide
GHG emissions” all emissions resulting from the combustion of gas for building services as well as emissions
resulting from gas transportation and distribution leaks).
percent per year to about 36.2 MMTCO\textsubscript{2}e, or approximately 62 percent below 1990 levels in 2040.\textsuperscript{10}

By 2040, then, the proposed agreement with TGP would alone authorize and enable the release of greenhouse gases of a volume that will have a significant and direct impact on the ability of the state to meet its GWSA-required emissions levels, as these contracts would be a source of emissions equivalent to approximately 2.1 percent of the total permitted in the Commonwealth as a whole by the GWSA in that timeframe for the entire state economy. Indeed, contrary to the Company’s suggestion here that these contracts are necessary to serve a sustained high volume of gas consumption by its customers through 2038, the Commonwealth already anticipates that in the same timeframe, compliance with the GWSA will require the use of less gas as the Commonwealth “electrify[es] the buildings sector’s heating and cooling loads” and develops non-fossil “renewable thermal market.”\textsuperscript{11}

Q. Does the Petition, or any other document in the record, contain an analysis of either the greenhouse gas emissions that will result from the proposed agreements or their impact on the ability of the Commonwealth to meet its GWSA-required emissions reductions over the life of the contracts?

A. No, I have seen no such analysis in the record as of the date of this testimony. The Petition itself contains no mention whatsoever of either the greenhouse gas emissions that can be reasonably assumed will result from the approval of the proposed contracts, or of the impact of such emissions on the state’s ability to meet its GWSA-required emissions reduction. Similarly, there is no mention of either in

\textsuperscript{10} Based on a straight-line decline from the GWSA’s 25 percent emissions reduction required by 2020 to the 80 percent reduction required by 2050.

\textsuperscript{11} See, e.g., 2015 CECP at 1-10, 50-54 (meeting the GWSA’s emissions limits between 2030 and 2050 will require “electrification of the buildings sector’s heating and cooling loads” and the development of non-fossil “renewable thermal market”).
the Company’s approved 2016 Forecast and Supply Plan which the Petition
references and relies on.

Q. Have you seen any mention of greenhouse gas emissions or the GWSA by the
Company in the record?

A. Only one, in the Company’s February 7, 2018 response to request for information
DPU-1-1. However, that response alone does not contain sufficient information or
analysis upon which one can reasonably conclude that approval of the proposed
contracts is consistent with the GWSA.

Q. What does that response say?

A. The only information provided in that response that is relevant to an assessment of
greenhouse gas emissions in the context of the GWSA appears in the second
paragraph of its first page where the Company argues that 16,000 Dth/day of the
40,000 Dth/day that the proposed contract with TGP would provide will “replace . .
current supply” in a manner that “will have no net impact on greenhouse gas
emissions[.]”

Even if it is true that that about 40 percent of the gas from the TGP agreement will
replace previously approved gas supply, this fact alone cannot support a conclusion
that the proposed 20-year supply agreement with TGP will not have a significant
impact on the ability of the Commonwealth to meet its GWSA-required emissions
levels.

The 60 percent of gas consumption that the proposed TGP contract would here
newly authorize represents a substantial volume of new emissions, some 0.5
MMTCO\textsubscript{2}e per year, which will have a meaningful impact on the Commonwealth’s
statewide greenhouse emissions levels particularly near the end of the proposed

\textsuperscript{12} Ex. DPU-1-1.
contracts. That volume alone will in 2038 represent 1.3 percent of the state’s entire allowed emissions under the GWSA.

Q. Does Eversource advance any other arguments regarding the GWSA-consistency of the proposed contracts?

A. Yes. In its response to DPU 1-1, the Company states that the proposed contract with TGP is consistent with the GWSA because 60 percent of the proposed contract volume will serve new loads that “are generally derived from customers converting from higher greenhouse gas emitting oil to lower greenhouse gas emitting natural gas.”

Q. Can you reasonably assess whether the proposed contracts are consistent with the GWSA based on that statement?

A. No. As I indicated previously, assessing consistency with GWSA requires evidence of emission reductions that assist the Commonwealth with achieving its GWSA goals (as distinct from simply not actively harming the Commonwealth’s achievement of GWSA goals) as well as evidence of emission impacts that is both quantitative and specific. Here, that would require, at minimum, quantitative estimates of the expected number of conversions from a different space heating fuel to natural gas caused by the proposed increase in TGP pipeline capacity, of the resulting change in expected greenhouse gas emissions, and of the pace and scope of reductions in greenhouse gas emissions required in the same timeframe by the GWSA.

Q. In addition to expected greenhouse gas emissions from combusting gas, are there any additional sources of greenhouse gas emissions that are reasonably foreseeable from a proposed contract for new gas supply?

A. Yes. Analysis should be presented of the known and reasonably estimable greenhouse gas emissions that can and should be assumed will occur from the transport and distribution of the gas associated with such an agreement (based on...
current technology and scientific assessments of existing Commonwealth leak rates). The Department has determined that 0.6 to 1.1 percent of total gas received into the Commonwealth’s gas distribution system is lost to the atmosphere as direct methane emissions due to leakage throughout the system.\(^{13}\) Assuming in the absence here of evidence to the contrary regarding the Company’s own leak rates, the Department must assume that at least 0.85 percent (the mid-point of the 0.6 to 1.1 percent range) of the new 40,000 Dth/day volume of gas that the proposed TGP contract would authorize would similarly be released into the atmosphere again, with substantial potential impact to the state’s ability to comply with GWSA-required emissions limits over the life of these contracts. Such reasonably expected leakage would increase expected greenhouse gas emissions resulting from these contracts by as much as 0.2 MMTCO\(_2\)e annually over the life of the proposed TGP contract (or 0.5 percent of total state emissions in 2040).\(^{14}\)

Q. Does this conclude your testimony?

A. Yes, it does.

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\(^{13}\) See, e.g., ICF, *Lost and Unaccounted For Gas* (Dec. 23, 2014) (prepared for the Department) at i.