September 18, 2020

SUBMITTED VIA EMAIL TO CLIMATE.STRATEGIES@MASS.GOV

Sharon Weber
Massachusetts Department of Environmental Protection
1 Winter Street
Boston, MA 02108

Re: Comment of Environmental Defense Fund on the Massachusetts Department of Environmental Protection's Program Review of 310 CMR 7.73, Reducing Methane Emissions from Natural Gas Distribution Mains and Services

Dear Ms. Weber:

Environmental Defense Fund ("EDF") respectfully submits this comment to the Massachusetts Department of Environmental Protection ("MassDEP"), in the matter of its Program Review of 310 CMR 7.73, Reducing Methane Emissions from Natural Gas Distribution Mains and Services ("Gas Distribution Methane Standard"). Massachusetts is a national leader on climate action, and this comment details a key opportunity for MassDEP to continue that leadership in its oversight of methane emissions from the gas distribution system. MassDEP should require the use of advanced leak detection technology and data analytics ("ALD+") as a feasible technology to detect and quantify gas leaks. In particular, this comment explains that (1) MassDEP should continue its Gas Distribution Methane standard to comply with Massachusetts' ambitious climate policies; (2) ALD+ is an effective, available tool that gas utilities should incorporate into their operations to track and reduce methane leaks with greater accuracy than traditional technologies; and (3) gas utilities across the country use ALD+ for this purpose.

I. The Gas Distribution Methane Standard (310 CMR 7.73) was Created to Address Methane Emissions from the Natural Gas Sector, and MassDEP Must Continue the Program to Fulfill Its Statutory Obligation

The Massachusetts Global Warming Solutions Act ("Act"), which became law in 2008, mandates that the Commonwealth of Massachusetts adopt measures to reduce statewide

greenhouse gas ("GHG") emissions by 25% by 2020 and 80% by 2050, from a 1990 baseline.[1] Governor Baker recently enhanced the state's ambitious climate target, committing to achieve net-zero GHG emissions by 2050.[2] The Act requires that MassDEP promulgate regulations to establish "declining annual aggregate emission limits" for sources and source categories of GHG emissions.[3] Additionally, the Act specifically recognizes methane as a contributor to climate change.[4] Methane is a potent greenhouse gas that causes 84 times as much global warming as the equivalent amount of carbon dioxide over a twenty-year horizon.[5]

In 2016, the Massachusetts Supreme Court held that the existing MassDEP standards failed to satisfy the requirements of the Global Warming Solutions Act, and that the Act requires MassDEP to promulgate annually-declining volumetric limits for sources of GHG emissions.[6] Later that year, Governor Baker issued an Executive Order requiring MassDEP, in relevant part, to issue regulations establishing GHG emission limits for the natural gas distribution system.[7] The Executive Order sought to ensure that MassDEP fulfilled its obligations under the Act to establish declining GHG emission limits for various sources.

MassDEP acted accordingly and promulgated new GHG emission standards in 2017, including 310 CMR 7.73, Reducing Methane Emissions from Natural Gas Distribution Mains and Services (hereinafter referred to as the "Gas Distribution Methane Standard").[8] The stated purpose of the Gas Distribution Methane Standard is to contribute to the achievement of the GHG emission reduction goals of the Global Warming Solutions Act, by reducing methane emissions from the

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1 MASS. GEN. LAWS ch. 21N, §§ 3-4 (2019); An Act Establishing the Global Warming Solutions Act, 2008 Mass. Acts Ch. 298, Bill No. S2540 (approved Aug. 7, 2008).

2 Massachusetts Executive Office of Energy and Environmental Affairs, Determination of Statewide Emissions Limit for 2020 (Apr. 22, 2020), https://www.mass.gov/doc/final-signed-letter-of-determination-for-2050-emissions-limit (setting a legally binding statewide limit of net zero greenhouse gas emissions by 2050, defined as 85 percent below 1990 levels); Governor Baker, State of the State Address (Jan. 21, 2021), https://www.mass.gov/news/governor-baker-delivers-2020-state-of-the-commonwealth-address (committing to achieving net-zero greenhouse gas emissions by 2050).

3 MASS. GEN. LAWS ch. 21N, § 3(d).

4 *Id.* ch. 21N, § 1.

5 IPCC, 2013: *Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* [Stocker, T.F., D. Qin, G.-K. Plattner, M. Tignor, S.K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex and P.M. Midgley (eds.)]. Cambridge University Press.

6 *Kain v. Mass. Dep't of Envtl. Prot.*, 49 N.E.3d 1124, 1142 (Mass. 2016).

7 Governor Charles Baker, Executive Order No. 569, Establishing an Integrated Climate Change Strategy for the Commonwealth (Sept. 16, 2016), https://www.mass.gov/doc/executive-order-569-mass-register-1323/download.

8 310 CMR 7.73 (issued July 27, 2017).

natural gas distribution system.[9] The Standard established annually declining limits on methane emissions for six major gas distribution utilities in Massachusetts for the 2018-2020 period.[10]

As recently explained by the Massachusetts Office of the Attorney General, "this suite of legislative, judicial, executive, and agency action evinces a strong, central policy goal—across Administrations spanning over a decade—to make the changes necessary to achieve net-zero carbon emissions in the Commonwealth."[11]

MassDEP is currently undertaking the required Program Review of the Gas Distribution Methane Standard, which must be completed by December 31, 2020.[12] The review aims "to determine whether the program should be amended or extended" and to "evaluate whether to require the use of feasible technologies to detect and quantify gas leaks."[13]

MassDEP should extend the Gas Distribution Methane standard beyond 2020, with emission limits that continue to decline year-over-year. As the Massachusetts Supreme Court explained, the Global Warming Solutions Act requires the MassDEP to issue standards "that address multiple sources or categories of sources of emissions, impose a limit on emissions that may be released, limit the aggregate emissions released from each group of regulated sources or categories of sources, set emissions limits for each year, and set limits that decline on an annual basis."[14] In issuing the Gas Distribution Methane Standard, MassDEP took action to fulfill this statutory obligation. MassDEP was correct in its decision to focus on natural gas distribution systems as a source of GHG emissions, because gas leaks are a historically underestimated source of methane, a highly potent contributor to climate change. MassDEP must continue to fulfill its statutory obligation by extending the Gas Distribution Methane Standard.

II. ALD+ Can Detect and Quantify Methane Emissions with Greater Accuracy than Traditional Survey Methods

Natural gas leakage is widespread and is responsible for a significant volume of methane emissions. Academic findings have demonstrated that observed methane emissions from cities—particularly East Coast cities with older gas distribution systems—are about twice that reported

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9 *See* 310 CMR 7.73(1).

10 310 CMR 7.73(4). The methane emissions limits are expressed in carbon dioxide equivalent ("CO2e").

11 Mass. Office of the Attorney General, Petition Requesting an Investigation at p7, Mass. DPU Docket 20-80 (June 4, 2020).

12 *See* MassDEP Presentation: 310 CMR 7.73 Program Review (Sept. 10, 2020), https://www.mass.gov/doc/presentation-310-cmr-773-program-overview/download.

13 310 CMR 7.73(9).

14 *Kain v. Mass. Dep't of Envtl. Prot.*, 49 N.E.3d 1124, 1136 (Mass. 2016).

in the U.S. Environmental Protection Agency inventory.[15] Furthermore, peer-reviewed studies have shown that utilities using traditional survey methods were able to locate fewer gas leaks than were found using advanced leak detection technology and data analytics ("ALD+").[16] Thus, natural gas utilities are likely to have more leaks, and are emitting significantly more methane from their systems, than is being reported to the U.S. EPA and other agencies.

The Gas Distribution Methane Standard issued by MassDEP in 2017 is an important step towards reducing methane emissions from gas utility systems: establishing an obligation for individual utilities to reduce their fugitive emissions and an annual reporting system to track progress.[17] But MassDEP should continue to expand and improve this program to ensure greater methane emission reductions in future years. In considering changes to the program, MassDEP asks "Are there practical, economically feasible technologies to detect and quantify gas leaks?"[18] The answer is yes. ALD+ is an available, effective, and economically feasible technology that can identify additional and different leaks from traditional survey methods, and MassDEP should require the use of ALD+ by Massachusetts gas utilities.

A. Capabilities and Attributes of ALD+

Advanced leak detection technology uses highly sensitive sensors—with detection capabilities on the order of parts per billion—installed on vehicles to collect emissions data such as methane and ethane while driving selected survey routes and collecting GPS and wind data. The data are then analyzed using algorithms to draw out key leak information such as estimated leak flow rate (e.g. liters per minute), leak density (e.g. leaks per mile), and probable leak grade (e.g. Type 1, 2, 2A, or 3).[19] ALD+, and the analytics and visualizations that can be developed using these methods, can provide more accurate and useful tools in a gas utility's efforts to track and reduce methane emissions from its distribution system and improve prioritization of leak repairs and leak-prone pipe replacement.

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15 G. Plant et al., Large Fugitive Methane Emissions from Urban Centers Along the U.S. East Coast, Geophysical Research Letters (July 2019), https://agupubs.onlinelibrary.wiley.com/doi/abs/10.1029/2019GL082635.

16 Weller, Zachary et al., *Vehicle Based Methane Surveys for Finding Natural Gas Leaks and Estimating their Size: Validation and Uncertainty*, Environmental Science & Technology, 2018, 52, 20, 11922–11930, https://pubs.acs.org/doi/10.1021/acs.est.8b03135.

17 310 CMR 7.73(4), (5).

18 MassDEP, Presentation: 310 CMR 7.73 Program Review at Slide 5 (Sept. 10, 2020), https://www.mass.gov/doc/presentation-310-cmr-773-program-overview/download.

19 For a publicly available description of an algorithm for developing leak indications using data from mobile methane surveys, *see* Weller, Z., D., Yang, D. K., & von Fischer, J. C., *An open source algorithm to detect natural gas leaks from mobile methane survey data*. Plos One, 14(2), e0212287 (2019), https://doi.org/10.1371/journal.pone.0212287.

ALD+ is typically able to find many more leaks than traditional technologies. A 2018 peer-reviewed study found that utility crews locate only 35% of the pipeline leaks found using traditional technologies in comparison to using ALD+.[20] Two studies by the utility Pacific Gas and Electric Company ("PG&E") similarly found a fraction of "false negatives" where leaks exist and are detected by ALD+ but are not found using traditional survey methods.[21] Thus, combining ALD+ with traditional leak surveys can offer utilities unique insight into their systems that is not possible using only traditional leak survey methods.

ALD+ not only offers a better understanding of leak density (leaks per mile), but also can be used to estimate leak flow rate (volume lost over time). Leak flow rate data derived from ALD+ can provide a real-time estimate of a gas utility's fugitive methane emissions, and the utility can reduce emissions more rapidly by targeting large, super-emitting leaks identified by the ALD+ survey and analysis. Peer-reviewed studies estimate, based on aggregated leak flow rate data, that methane emissions from the gas distribution system could by reduced by 50% by repairing only the largest 20% of leaks.[22]

Gas utilities in Massachusetts could deploy periodic, systemwide ALD+ surveys to establish an emissions baseline and track progress toward reducing emissions by remediating leaks. This would result in measurable outcomes that allow utilities to receive credit for actions they take to reduce emissions sooner. Using ALD+ to estimate a baseline systemwide leak flow rate could result in a higher estimate of methane emissions than Massachusetts utilities are currently reporting. This can and should be viewed as an opportunity to pick low-hanging fruit to reduce GHG emissions, because it allows utilities to identify and prioritize areas (i.e., super-emitting leaks) where they can cost-effectively mitigate GHG emissions using proven technologies and methods. Furthermore, integration of ALD+ into the Gas Distribution Methane Standard will allow for greater transparency, providing MassDEP with helpful, real-time data to track emissions and achieved reductions on a regular basis.

ALD+ is an economically feasible technology for gas utilities, as evidenced by the multiple examples of gas utilities that have incorporated ALD+ into their operations, *see infra* Part III.

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[20] Weller, Zachary et al., *Vehicle Based Methane Surveys for Finding Natural Gas Leaks and Estimating their Size: Validation and Uncertainty*, Environmental Science & Technology, 2018, 52, 20, 11922–11930, https://pubs.acs.org/doi/10.1021/acs.est.8b03135. If this detection rate is applied at the national scale, then the national inventory for the number of pipeline leaks in natural gas distribution infrastructure would increase by a factor of 2.4. *Id.* at 11925.

[21] *See* Kerans, Mike, Picarro Surveyor Leak Detection Study – Sacramento Side-by-Side Study (2012); Clark, Timothy, Picarro Surveyor Leak Detection Study – Diablo Side-by-Side Study (2012); Press Release: New Independent Research Reveals Picarro Surveyor as Benchmark Solution in Natural Gas Leak Detection, Picarro (Feb. 5, 2013), https://www.picarro.com/company/press-releases/2013/new-independent-research-reveals-picarro-surveyortm-benchmark-solution.

[22] Von Fischer, J., et al., *Rapid, Vehicle-Based Identification of Location and Magnitude of Urban Natural Gas Pipeline Leaks*, Environmental Science & Technology, 51(7), 4091–4099 (2017), https://doi.org/10.1021/acs.est.6b06095.

Two ALD+ service providers, Picarro and ABB Inc.-Los Gatos, have provided helpful information about the cost of ALD+ and the potential for cost-savings for individual gas utilities. For example, Picarro estimates the cost of conducting an ALD+ survey to be approximately $105 per mile of distribution main.[23] In providing a detailed cost schedule for surveying 2,000 miles of infrastructure for People's Gas Light Company in Chicago, Picarro estimated the total cost to be $312,940, or about $156 per mile.[24]

Incorporating ALD+ into MassDEP's Gas Distribution Methane Standard would improve the accuracy of the emission data reported and allow gas utilities in Massachusetts to achieve greater reductions in methane emissions.

B. Additional Context

Continuing to reduce methane emissions from the natural gas distribution system is necessary to assist in meeting Massachusetts' ambitious climate goal to achieve net-zero GHG emissions by 2050. As shown in the chart below, gas distribution companies in Massachusetts have a significant number of miles of leak-prone distribution pipelines in their systems, particularly cast iron. Cast iron, unprotected bare steel, copper, and ductile iron pipeline materials are particularly prone to leaks,[25] and thus represent a more significant emissions concern than other types of pipeline materials. This data further supports the continued need and importance of MassDEP's Gas Distribution Methane Standard.

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[23] Picarro, Inc. Response to Letter of Inquiry Dated May 9, 2017 from the Citizen's Utility Board, Submitted in Illinois Commerce Commission Docket No. 16-0376, at p3 (2017).

[24] *Id.* at Appendix 2, Cost Schedule.

[25] U.S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration, *Report on State-level Policies That Encourage or Present Barriers to the Repair and Replacement of Leaking Natural Gas Pipelines* (Aug. 2017), https://www.phmsa.dot.gov/sites/phmsa.dot.gov/files/docs/news/18356/statebarrierstorepairreplaceleakingnatgaspipelinesaug2017.pdf; American Gas Foundation & Yardley Associates, *Gas Distribution Infrastructure: Pipeline Replacement and Upgrades - Cost Recovery Issues and Approaches* (July 2012), https://www.phmsa.dot.gov/sites/phmsa.dot.gov/files/docs/07-2012%20Gas%20Distribution%20Infrastructure%20-%20Pipeline%20Replacement%20and%20Upgrades.pdf.

Top Ten States by Miles of Leak Prone Mains[26]

	Unprotected Bare Steel	Cast Iron	Ductile Iron	Copper	**Total Leak Prone Pipe**	Total miles
U.S. Total	33,336	22,861	513	13	**56,722**	1,305,025
PA	5,932	2,525	170	2	**8,629**	48,335
NY	4,972	3,175	-	0	**8,147**	49,307
OH	6,197	197	1	1	**6,396**	58,759
NJ	550	3,911	24	1	**4,486**	35,007
TX	3,905	466	-	-	**4,371**	107,799
MA	1,146	2,925	1	0	**4,073**	21,714
CA	3,244	58	-	0	**3,302**	106,806
MI	352	2,389	-	-	**2,742**	59,731
WV	2,546	12	-	-	**2,557**	10,961
IL	28	1,152	205	-	**1,385**	62,168

Most gas utilities estimate the GHG emissions on their system using the EPA Subpart W emission factors, which are emissions estimates per mile of pipeline main, by material (e.g. cast iron, plastic, etc.), averaged from samples taken in limited studies across the entire nation.[27] The EPA emission accounting method is less than optimal and is not the most accurate method available in this context. The EPA emission factors were developed using leak inventories that relied on traditional leak detection technology that finds far fewer leaks than ALD+.[28] EDF recognizes that the Gas Distribution Methane standard and the MassDEP GHG emissions inventory use distinct sets of emission factors—although some of those emission factors may be derived from EPA Subpart W.[29] Peer-reviewed studies and state regulators in other jurisdictions,

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[26] U.S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration, 2018 Gas Distribution Annual Report Data (retrieved 2019), https://www.phmsa.dot.gov/data-and-statistics/pipeline/gas-distribution-gas-gathering-gas-transmission-hazardous-liquids.

[27] 40 C.F.R. Part 98, Subpart W, Table W-7 (detailing the emission factors equations to be used for different types of petroleum and gas systems).

[28] *See* U.S. Environmental Protection Agency, Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2018, Chapter 3: Energy, at 3-88 (Apr. 2020), https://www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks-1990-2018.

[29] *See* 310 CMR 7.73(5)(b)(8); MassDEP, Statewide Greenhouse Gas Emissions Level: 1990 Baseline and 2020 Business As Usual Projection Update at p18 (July 2016), https://www.mass.gov/doc/statewide-greenhouse-gas-ghg-emissions-baseline-projection-update-including-appendices-a-b/download ("Prior to this inventory update, the emission factors used to estimate this sector's emissions from pipelines and services were those found in EPA's SGIT. This

however, have observed that it is challenging for emission factors to capture the methane emissions associated with super-emitting leaks: "[A] small number of emission sources, so-called 'super-emitters,' account for the majority of emissions across the NG supply chain. Observing these rare but large sources is an important part of accurately characterizing emissions factors, and as a result, a large sample size is paramount for estimating emissions rates and total emissions."[30]

III. Gas Utilities Around the Country Have Deployed ALD+ to Detect and Quantify Methane Emissions.

Utilities across the United States are incorporating ALD+ into their operations, and ALD+ is being used in at least seven countries and on four continents worldwide.[31] ALD+ delivers significant environmental benefits, financial savings that can benefit ratepayers, improved safety, and other system-wide benefits. Major gas utilities including PSE&G, New Jersey's oldest and largest utility,[32] Elizabethtown Gas in New Jersey,[33] National Grid in New York,[34] CenterPoint

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inventory update uses a combination of emission factors from SGIT, from an ICF report for the Massachusetts Department of Public Utilities, and from an April 2015 study that measured equipment emissions to estimate current emission factors.").

30 Weller et al., *A National Estimate of Methane Leakage from Pipeline Mains in Natural Gas Local Distribution Systems*, Environmental Science & Technology, 2020, 54, 8958−8967 (June 2020), https://pubs.acs.org/doi/10.1021/acs.est.0c00437; *see also* NYSERDA, *New York State Oil and Gas Sector Methane Emissions Inventory*, Final Report No. 19-36, at p132 (July 2019), https://www.nyserda.ny.gov/About/Publications/EA-Reports-and-Studies/Greenhouse-Gas-Inventory ("High-emitting sources have been widely observed and described in the literature along all stages of the upstream, midstream, and downstream process, with a small number of sites or facilities contributing a majority of regional emissions in many instances. However, given the unknown distribution of high-emitting sources in New York State, it is challenging to apply statistical methods to estimate the likelihood of high-emitting sources.").

31 Aaron Van Pelt, Picarro, Inc., Presentation: Picarro Natural Gas Network Management Solution, Pipeline Safety Trust Conference, New Orleans, LA (Nov. 7, 2019), http://pstrust.org/wp-content/uploads/2019/11/Picarro-Pipeline-Safety-Trust-11-7-19.pdf.

32 *See* EDF, Collaboration with PSE&G: Data helps prioritize gas line replacement, https://www.edf.org/climate/methanemaps/pseg-collaboration (last accessed Sept. 17, 2020).

33 *See* Elizabethtown Gas Company, Semi-Annual Status Report, Attachment D: Methane Leak Survey Report, filed in NY BPU Docket No. GR18101197 (Feb. 18, 2020).

34 *Proceeding on Motion of the Commission as to the Rates, Charges, Rules and Regulations of The Brooklyn Union Gas Company d/b/a National Grid NY for Gas Service*, Case 19-G-0309, National Grid Gas Safety Panel Direct Testimony at 45-46 (Apr. 2019) (proposing an Enhanced High Emitter Methane Detection Program to conduct ALD surveys in previously-identified vulnerable areas so that the utilities can identify, quantify, and repair high-emitting leaks more quickly). This rate case is ongoing.

Energy in Texas and Minnesota,[35] and Pacific Gas and Electric ("PG&E") in California[36] have recognized these and incorporated ALD+ into their operations.

PSE&G first adopted ALD+ as part of a 2015 settlement with EDF, approved by the New Jersey Board of Public Utilities.[37] The utility agreed to consider data on the volume of leaked methane emissions, in conjunction with other relevant factors, to identify pipes that are most in need of replacement as part of a three-year $905 million pipe replacement program.[38] PSE&G achieved an 83% reduction in methane emissions one-third of the time faster than in a business as usual scenario by incorporating ALD+ in the prioritization of approximately 175 miles of pipeline main replacements.[39] This difference is noteworthy considering that the typical cost to replace one mile of gas line on PSE&G's system is $1.5 to $2.0 million.

PSE&G built upon these efforts in the second phase of its gas system modernization program, committing to contract with a third party vendor to conduct an ALD+ survey in 2018 on 280 miles of leak prone pipeline.[40] The leak survey data was used to generate an "Estimated Flow Rate per Mile (Liter/min/mile)," and PSE&G then developed a ranking threshold which is being used to prioritize grids for replacement in subsequent program years.[41] In a Methane Leak Surveying Report filed about the program, PSE&G reports: "This variability shows the power of the methane mapping technique for providing additional granularity that can be used to maximize methane emissions reductions and/or maximize remediation of the maximum number

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35 CenterPoint Energy, Shared Impact - 2018 Corporate Responsibility Report (2018), https://investors.centerpointenergy.com/static-files/82c57a89-1fc3-43af-ac9e-9cabfb21f070.

36 PG&E, Press Release: New PG&E Fleet Inspects One Million Homes and Businesses Using Super-Sensitive Gas-Detecting Technology (Sept. 2, 2016), https://www.pge.com/en/about/newsroom/newsdetails/index.page?title=20160902_new_pge_fleet_inspects_one_million_homes_and_businesses__using_super-sensitive_gas-detecting_technology.

37 *Decision and Order of the New Jersey Board of Public Utilities In The Matter Of Public Service Electric And Gas Company for Approval of a Gas System Modernization Program and Associated Cost Recovery Mechanism*, Docket No. GR15030272 (Nov. 16, 2015), retrieved from http://www.nj.gov/bpu/pdf/boardorders/2015/20151120/11-16-15-2F.pdf.

38 EDF, Collaboration with PSE&G: Data helps prioritize gas line replacement, https://www.edf.org/climate/methanemaps/pseg-collaboration (last accessed Sept. 17, 2020).

39 Palacios, V., George, S. R., von Fischer, J. C., & Mohlin, K., *Integrating Leak Quantification into Natural Gas Utility Operations*. Public Utilities Fortnightly (May 2017).

40 *In the Matter of the Petition of Public Service Electric and Gas Company for Approval of the Next Phase of the Gas System Modernization Program and Associated Cost Recovery Mechanism*, BPU Docket No. GR17070776, Stipulation of Settlement and Agreement at p24 (Apr. 18, 2018). The BPU approved this settlement in a June 1, 2018 order.

41 Picarro Emissions Quantification Results Final Report in Support of the Methane Leak Surveying Report for the PSE&G Gas System Modernization Program ("GSMP") II Program (filed Feb. 28, 2020 by PSE&G).

of belowground leaks through changes to construction priorities based on these methane maps and associated data."[42]

PG&E in California has integrated ALD+ into its operations with a Super Emitter program that seeks to identify the largest leaks on its system (responsible for the most methane emissions) and address those leaks quickly to maximize emissions reductions. PG&E—working with ALD+ service provider Picarro—uses a statistical model to prioritize geographic plats based on a likelihood of finding the most leaks, allowing PG&E to increase the number of leaks found by 15% to 80% while surveying 25% to 50% fewer services.[43] In 2018, PG&E identified and repaired 220 Super Emitter leaks, estimating that the program achieved an emissions reduction of 90 Mscf (million standard cubic feet) for 2018 and is expected to result in further emissions reductions in the future.[44]

PG&E is also incorporating these statistical models into an analysis of the number of unknown leaks in their system, which they plan to use to estimate total GHG emissions from leaks in their system, a figure that is incorporated into their annual greenhouse gas emissions inventory.[45] PG&E's use of ALD+ is in compliance with the best practices and reporting requirements approved by the California Public Utilities Commission as part of a Natural Gas Leak Abatement Program aimed at reducing methane emissions from the natural gas distribution sector, in support of California's goal to reduce methane emissions 40% below 2013 levels by 2030.[46] ALD+ allows PG&E not only to optimize efficiency in its leak survey process, but also to find and remediate more leaks sooner, thereby reducing risk, cost, and emissions.

CenterPoint Energy in Texas and Minnesota has thoroughly integrated ALD+ into its operations, piloting the technology in 2013 and testing and phasing ALD+ into its operations in 2016.[47] The company conducted pilots in Houston and Minneapolis and reported that both pilots saw improvements in leak find rates five times greater than traditional methods.[48] By 2018,

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[42] *Id.* at p11.

[43] François Rongere, PG&E, Presentation: Risk Based Leak Surveys (Oct. 2019).

[44] Pacific Gas and Electric Company, Natural Gas Leakage Abatement Report, California Public Utilities Commission Rulemaking 15-01-008, at 9 (June 17, 2019).

[45] François Rongere, PG&E, Presentation: Risk Based Leak Surveys (Oct. 2019).

[46] California Public Utilities Commission, Decision 17-06-015, *Decision Approving Natural Gas Leak Abatement Program Consistent with Senate Bill 1371*, Rulemaking 15-01-008 (June 15, 2017).

[47] CenterPoint Energy, Shared Impact - 2018 Corporate Responsibility Report (2018), https://investors.centerpointenergy.com/static-files/82c57a89-1fc3-43af-ac9e-9cabfb21f070.

[48] Centers, Tal, & Brad Coppedge, Picarro Leak Surveyor (2015), https://southerngas.org/component/content/article/102-corporateservices/committees/1027-pipeline-safety-council; *see also* Centers, Tal & Mark Menzie, Presentation: Advanced Leak Detection Technology Implementation Planning (May 21, 2015), https://slideplayer.com/slide/16333053/.

CenterPoint had fully integrated Picarro units into its operations, boasting a fleet of 16 surveyor units to conduct leak surveys and identify high-emitting leaks for repair.

CenterPoint has stated that ALD+ allows for "[n]ear real-time tracking of the leak survey results and natural gas system assets surveyed in the geographic information system, replacing manual tracking of completed leak surveys."[49] CenterPoint Energy recently noted: "By incorporating EQ [Picarro's Emissions Quantification] technology, we expect to enhance the ability to select and design pipe replacements that deliver increased value in safety and emission reductions."[50]

IV. Conclusion

It is necessary that MassDEP continue to require declining volumetric reductions in GHG emissions from the natural gas distribution sector, in order to assist in achieving the state's mandate of net-zero GHG emissions by 2050, and in order to fulfill its obligations under the Global Warming Solutions Act to address GHG emissions from various source categories. ALD+ is an accepted and effective technology that can detect more gas leaks and quantify the methane emissions associated with those leaks. MassDEP should require the use of ALD+ as a feasible technology to detect and quantify gas leaks. EDF looks forward to participating in the MassDEP's Program Review for the Gas Distribution Methane standard in order to share information about how ALD+ can further improve the program to achieve greater reductions in methane emissions from the natural gas distribution system.

Dated: September 18, 2020

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[49] CenterPoint Energy, Shared Impact - 2018 Corporate Responsibility Report, at Page 26 (2018), https://investors.centerpointenergy.com/static-files/82c57a89-1fc3-43af-ac9e-9cabfb21f070.

[50] CenterPoint Energy, Shared Impact - 2018 Corporate Responsibility Report, at Page 26 (2018), https://investors.centerpointenergy.com/static-files/82c57a89-1fc3-43af-ac9e-9cabfb21f070.