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Advancing the Clean Energy Future
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Comments on the Future of Gas Report Outline

Dear Mr. Nelson and Ms. Pham:

Thank you for the opportunity to provide comments on the Rhode Island Future of Gas Final Report Outline ("outline"). Acadia Center submits the following comments regarding the outline for the report on policy recommendations ("Policy Report") in Rhode Island Public Utilities Commission (RIPUC) Docket No. 22-01-NG.

Future Feedback on Apex Report

It is important that stakeholders, including Acadia Center, have a future opportunity to comment on the draft Policy Report, opposed to being limited to only providing feedback on the relatively high-level outline provided to stakeholders that the comments below are in direct response to. The outline, as currently constructed, covers a wide range of complex regulatory, policy and programmatic concepts, but provides sparse details on each topic. While the comments provided below should be helpful in informing the content of the forthcoming Policy Report, they are limited in the sense that Acadia Center does not have fleshed out policy details to react and respond to. In a complex proceeding like the Future of Gas, both types of comments (high-level responses to an outline and more detailed responses to a fleshed out draft report) hold value in informing the eventual policy recommendations stemming from the proceeding. For this reason, Acadia Center respectfully requests an opportunity to provide comments on the proposed recommendations in the Policy Report before it is finalized.

The remainder of these comments are in direct response to specific topics included in the Report Outline, and the responses below are presented in the order in which each topic appears in the Report Outline.

III. Requirements of the Act on Climate

Consultant Staff Recommendation: Formal Emissions Targets Specific to Gas Distribution System

The Act on Climate (AoC) mandates the state of Rhode Island to achieve climate targets of 45% greenhouse gas (GHG) emissions reduction by 2030, 80% by 2040, and net-zero by 2050, compared to 1990 levels. These targets represent mandatory, enforceable goals. Given the urgency of the climate crisis, and the urgency of Rhode Island staying on decarbonization pathway trajectories that align with the overall economy-wide decarbonization mandates of AoC, it is concerning that the outline does not include a recommendation that the PUC adopt formal GHG reduction targets for

2030, 2040, and 2050 for the gas distribution system as a direct outcome of the 22-01-NG proceeding. Acadia Center acknowledges the challenges in setting gas distribution system GHG reduction targets, particularly given the fact that the AoC, or any subsequent laws, have not established emission reduction targets for specific subsectors (e.g., transportation, buildings, electricity). **On this point, Acadia Center urges the Policy Report to include a direct recommendation subsector GHG reduction targets be established by the Executive Climate Change Coordinating Council (EC4) for the years 2030, 2040, and 2050.** If established, these subsector targets will provide much-needed guidance to the various state agencies, including PUC, responsible for regulating emissions in accordance with the AoC for a given subsector of the state's economy.

While Acadia Center does not disagree with the value of a more formal, future PUC process specifically focused on the adoption of specific 2030, 2040 and 2050 gas distribution system emissions targets, we also urge the PUC to adopt a range of emissions targets for the gas distribution system for these years as a direct outcome of the 22-01-NG based on the information currently available. This range of targets would clearly communicate the emergency of reducing emissions with the gas distribution system in the immediate term while simultaneously leaving space for more granular reform of the targets in the near future.

In terms of setting the range of GHG reduction targets for the gas system, it may be prudent to look towards Rhode Island's neighbor to the north, Massachusetts, to inform this discussion, while tailoring an ultimate range to Rhode Island's circumstances. In late 2022, based on rigorous decarbonization pathways modeling analysis, Massachusetts adopted sector-specific GHG sublimits that, collectively, achieve the state's overarching gross GHG limits of 50% below 1990 levels by 2030 and 85% below 1990 levels by 2050.[1] While Massachusetts did not adopt a target specific to the gas distribution system – the buildings sector sector-specific sublimit (which Massachusetts did establish) could be used, by either Massachusetts or Rhode Island, to approximate a target specifically for the gas distribution system. As summarized in Table 1 below, the buildings sector sublimit in Massachusetts in 2030 represents a slightly lower percent reduction relative to the overall target (49% vs. 50%) while the inverse is true in 2050 – the buildings sublimit exceeds the overall target in terms of percent reduction (94% vs. 84%).

Table 1. Massachusetts 2030 and 2050 Statewide Gross Greenhouse Gas Emissions Limits and Sector-Specific Sublimits

Sector/Subsector	GHG Reduction Relative to 1990 Levels	
	2030	2050
Residential Heating and Cooling	49%	95%
Commercial & Industrial Heating and Cooling	49%	92%
Buildings Sector	49%	94%
Transportation	34%	86%
Electric Power	70%	93%
Total	**50%**	**85%**

[1] Massachusetts Clean Energy and Climate Plan for 2025 and 2030, Table 3.1, page 23, https://www.mass.gov/doc/clean-energy-and-climate-plan-for-2025-and-2030/download and Massachusetts Clean Energy and Climate Plan for 2050, Table 3-2, page 19 https://www.mass.gov/doc/2050-clean-energy-and-climate-plan/download

Given that both Massachusetts and Rhode Island have a state law mandating net zero emissions by 2050, it seems logical that the two states would strive for relatively similar GHG reduction trajectories in the building sector on the path to complying with the overarching 2050 mandate. So, for example, building off the Massachusetts example, the **PUC could approximate a 2030 buildings sector reduction target of 49% +/- 3% (i.e. 46%-52%) and a 2050 building sector reduction target of 94% +/- 3% (91% - 97%).** While the approach of using Massachusetts building sector GHG sublimits to inform a range of Rhode Island buildings subsector and gas distribution system sublimits is not ideal, it is a clear case of perfect being the enemy of the good. Establishing target reduction ranges as soon as possible would provide much needed policy decision making guidance in the near-term to address the urgency of AoC compliance, while still leaving room for more granular reform of the targets in a future PUC proceeding.

One issue with translating potential buildings sector GHG reduction targets to the gas system is that, based on Acadia Center's current understanding, there is not a clear understanding of GHG emissions associated with Rhode Island's natural gas distribution system in the baseline year (1990) by which 2030, 2040, and 2050 gas distribution sector GHG targets would be measured against. For example, the Rhode Island GHG Inventory ("GHG Inventory") reports that 1990 emissions in the buildings sector (residential, commercial, and industrial heating combined) were 4.11 MMT CO_2e, but there is no breakout provided by gas (e.g., natural gas vs heating oil vs propane).[2] The 1990 baseline gas system consumption, or associated emissions, was not included in either E3's Rhode Island Investigation into the Future of the Regulated Gas Distribution Business Technical Analysis Report ("E3 Report") or Technical Analysis Appendix A ("E3 Report Appendix"), and, based on direct communication with E3 staff, they do not have access to this data. EIA maintains a database of natural gas consumption by end use, but the comprehensive data set (including industrial customers) only goes back to 1997.[3]

Data on volumes of natural gas delivered to residential and commercial customers in Rhode Island in 1990 is included in the EIA dataset, but this information is incomplete without industrial customers and does not help to inform a true baseline for gas consumption. Direct communication with PUC staff indicated there was no clear path to obtaining this data, as FERC Form 2 did not exist in 1990, but staff indicated a paper records request may yield more information. Acadia Center reach out to RIDEM staff to better understand the GHG Inventory methodology associated with calculating emissions from the gas distribution sector in 1990 but has not heard back in time to incorporate that information into these comments. **All this is to say, Acadia Center recommends that the PUC prioritize obtaining data on gas distribution system total consumption in the state and, in coordination with RIDEM, compare that data to the 1990 natural gas consumptions embedded in the 1990 GHG Inventory – this is a necessary first step for informing a discussion around 2030, 2040 and 2050 gas distribution system GHG reduction targets.**

At this point, based on the available information at hand, Acadia Center can only state that the GHG Inventory indicates that from 1990-2021 (the most recent inventory year completed), building sector emissions in the state *declined* 11.2%.[4] Simultaneously, over that same period, EIA data suggests combined natural gas consumption in the

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[2] Rhode Island Greenhouse Gas Inventory, Complete 1990-2021 Rhode Island Greenhouse Gas Emissions Data Excel file, https://dem.ri.gov/environmental-protection-bureau/air-resources/rhode-island-greenhouse-gas-inventory

[3] U.S. Energy Information Administration "Natural Gas Consumption by End Use" https://www.eia.gov/dnav/ng/ng_cons_sum_dcu_SRI_a.htm

[4] Rhode Island Greenhouse Gas Inventory, Complete 1990-2021 Rhode Island Greenhouse Gas Emissions Data Excel file, https://dem.ri.gov/environmental-protection-bureau/air-resources/rhode-island-greenhouse-gas-inventory

residential and commercial sectors *increased* 15.6% (from 25,795 to 29,817 MCF).[5] In other words, based on the available data, the 1990-2021 trends in building sector GHG emissions (according to the RI GHG Inventory) and combined residential/commercial natural gas consumption (according to EIA) are not directly correlated – perhaps the correlation would be more direct if industrial sector gas consumption data for 1990 was available, but it's impossible to speculate.

Once data is obtained on the 1990 gas distribution system total consumption, and associated GHG emissions, this data could foster a discussion about how potential building subsector GHG emission reduction targets for 2030, 2040, and 2050 (discussed above) could be translated to more granular GHG emission reduction targets for the gas distribution system, specifically. For example, if it is revealed that the 1990-2021 trend in gas distribution system emission reduction is similar to the overall buildings subsector GHG reduction trend over that time period (~11% decline) it may be appropriate to set the gas distribution GHG reduction target at an equal level to the overarching building subsector target (e.g., 46%-52% below 1990 levels by 2030). On the contrary, if it is revealed that the overarching trend in 1990-2021 gas system emissions is significantly higher or lower than the emission trend in the buildings subsector over the time period, separate GHG reduction targets for the buildings sector and the gas distribution system may be more appropriate. Acadia Center looks forward to commenting on this topic in greater detail in the future once there is a better understanding of the 1990 gas system baseline and urges a more detailed conversation of this topic to be included in the draft Policy Report for stakeholders to respond to.

IV. Review of E3 Report and Conclusions

Different readers of the E3 Technical Report and Technical Appendix would come away with different key takeaways regarding how the analysis and its findings should shape policy recommendations in the Policy Report. Beyond the five key themes listed in the outline under IV. B. "Scenarios generally", Acadia Cener flags key three limitations of the pathways modeling performed by E3 and highlights how these key modeling limitations should inform the recommendations of the Policy Report. The three modeling limitations, as discussed in greater detail below are:

- **Emission reduction potential of alternative fuels:** High level of uncertainty
- **Post-2050 total resource costs across scenarios:** Lack of comparative analysis
- **Methane leaks from gas distribution & behind-the-meter:** High level of uncertainty

Scenarios Generally

The High Level of Risk Associated with Decarbonization Strategies Reliant on Alternative Fuels is Key Takeaway from the E3 Report That Should be Central in Informing the Recommendations of the Policy Report

In the draft outline, Section IV. Review of E3 Report and Conclusion, Subsection B "Sections generally" lists some of the high-level takeaways from the E3 Report. The only bullet in this section of the outline referencing alternative fuels states "Upfront costs of alternative fuels are large", but the risk associated with upfront costs of alternative fuels only represents one piece of the overall risk portfolio associated with alternative fuels, as the E3 report highlights.

[5] U.S. Energy Information Administration "Natural Gas Consumption by End Use" https://www.eia.gov/dnav/ng/ng_cons_sum_dcu_SRI_a.htm

Acadia Center suggests a much broader discussion of the high level of (multiple) risks associated with scenarios that are highly reliant on alternative fuels for decarbonizing the gas system. The E3 report explicitly makes the recommendation that this level of risk associated with alternative fuels should be addressed directly in the policy development phase of the Docket:

> *"The Technical Analysis demonstrates significant uncertainty associated with the availability, costs and efficacy of renewable fuels. This highlights the need for ways to mitigate uncertainty that can be addressed in the policy development phase of the Docket."*[6]

On this topic, E3 goes on to state:

> *"The significant uncertainty associated with the availability and cost of renewable fuels, as well as the emissions impact of fuels under different accounting assumptions, suggest an increasing need for policies that mitigate risk associated with renewable fuels. Such policies can be discussed and addressed in the Policy Development phase of this proceeding."*[7]

On the efficacy of alternative fuels, the entire E3 analysis hinges on the current GHG accounting structure of Rhode Island's GHG emissions accounting methodology in which "renewable fuels are considered carbon neutral." E3 summarizes the controversy surrounding this GHG accounting decision, by stating:

> *"Many stakeholders in and outside of Rhode Island have cautioned the current treatment of biogenic emissions as carbon neutral, stating the complexity and uncertainty associated with lifecycle emissions. EPA acknowledges this complexity and notes that "technical, policy and legal contexts may change over time that could lead to revisiting the treatment of biogenic emissions necessary."*[8] *In addition, the Rhode Island Department of Environmental Management (RIDEM) in its latest inventory recognizes the ongoing international controversy surrounding GHG accounting for energy generated from biogenic sources and continues to collaborate with stakeholders on a more robust framework."*[9]

The assumption that biofuels, including RNG, are GHG-neutral hinges on ignoring many of the lifecycle emissions from RNG. One of the key limitations of the RI GHG Inventory is that lifecycle emissions from RNG are not included. This is a gross simplification of a complex issue, as the EPA's Renewable Fuel Standard demonstrates (see Figure 1 below).[10] The EPA analyses examined the production of a number of different types of biofuels using various feedstocks. The results vary considerably, but the overwhelming majority of biofuels show some level of positive net

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[6] Rhode Island Investigation into the Future of the Regulated Gas Distribution Business, Technical Analysis Report, page 12 https://www.ethree.com/wp-content/uploads/2024/06/Docket-22-01-NG-E3-Technical-Analysis-Report.pdf

[7] E3 Report, page 105

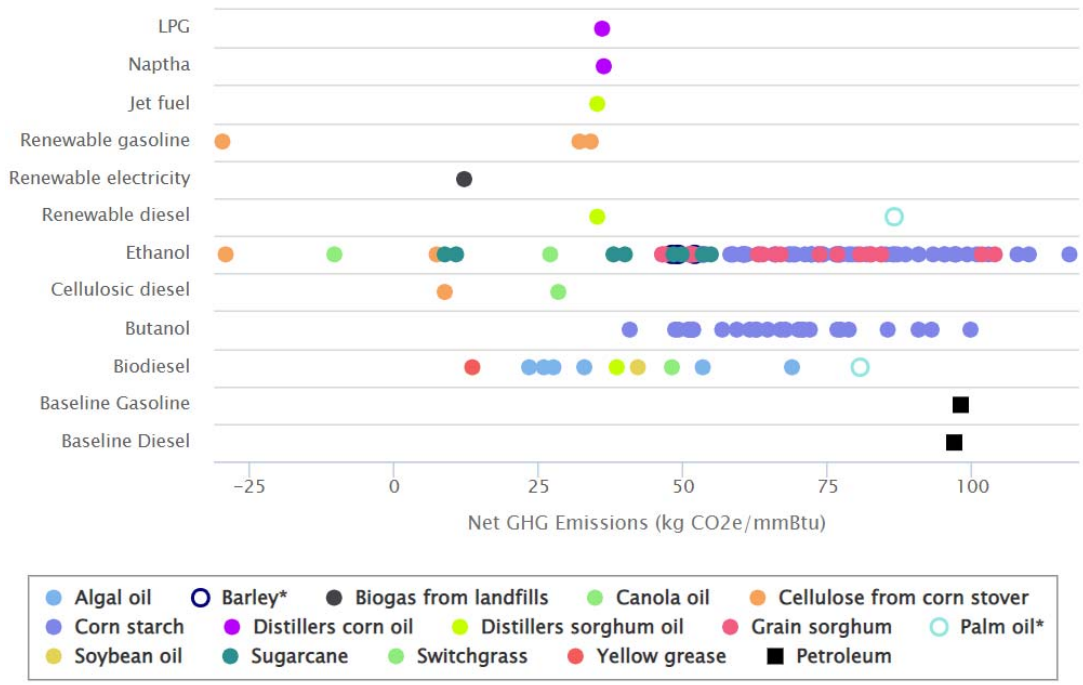
[8] Footnote embedded in E3 Report quote: EPA's Treatment of Biogenic Carbon Dioxide (CO_2) Emissions from Stationary Sources that Use Forest Biomass for Energy Production https://www.epa.gov/sites/default/files/2018-04/documents/biomass_policy_statement_2018_04_23.pdf

[9] E3 Report, page 26

[10] EPA "Lifecycle Greenhouse Gas Results" https://www.epa.gov/fuels-registration-reporting-and-compliance-help/lifecycle-greenhouse-gas-results

GHG emissions, with some biofuels exceeding the lifecycle emissions of conventional fossil fuels like gasoline and diesel.

Figure 1. EPA Renewable Fuel Standard Program Lifecycle GHG Emissions by Feedstock and Fuel Type[11]



This issue of lifecycle GHG emissions from biofuels gets thornier in the particular case of RNG, where methane leaks along the entire RNG supply chain pose massive GHG concerns. When analyzing the GHG impacts of RNG, it's important to consider the two general categories of RNG: 1) RNG derived from "intentionally produced" methane and 2) RNG derived from "waste methane".

An example of "intentionally produced methane" is converting agricultural residues (e.g. corn stalks remaining after harvest) to methane through a process known as gasification, and an example of "waste methane" is methane released by a landfill as organic material decays. E3 relies on both types of RNG across multiple scenarios in their analysis. As Dr. Emily Grubert, a professor of Environmental Engineering at Georgia Tech, points out in her research, we know that RNG systems leak methane, just like natural gas systems, only potentially at even higher rates. **When we *intentionally* produce methane, *any* methane leaks along the RNG supply chain result in a net increase in GHG emissions.**[12] In other words, if our goal is to minimize GHG emissions, we shouldn't be intentionally producing *any* methane that we know will leak.

[11] EPA "Lifecycle Greenhouse Gas Results" https://www.epa.gov/fuels-registration-reporting-and-compliance-help/lifecycle-greenhouse-gas-results

[12] Emily Grubert 2020 Environ. Res. Lett. 15 084041 https://iopscience.iop.org/article/10.1088/1748-9326/ab9335

For RNG produced using "waste methane", claims of GHG-neutrality are based on a flawed comparison against the worst possible alternative – that is, allowing methane released from sites like landfills to go directly into the atmosphere. That is unlikely to occur in a setting where GHG emissions are regulated, however, as the best option from a GHG perspective, by a wide margin, is to capture the biogas and combust it in a combined heat and power facility that produces both electricity and useful heat. This on-site combustion efficiently converts methane to CO_2 (a far less potent GHG), while simultaneously avoiding downstream methane emissions associated with upgrading, transporting, and distributing RNG. It also has the critical benefit of serving as a "firm" electricity generation resource to compliment a future grid with a high penetration of intermittent renewable electricity resources.

If combined heat and power at a particular site is not a viable option, even just burning the methane on site (a process known as flaring) is better from a GHG perspective than RNG production because it avoids downstream methane leaks along the RNG supply chain, as research by Dr. Grubert highlights.[13] For RNG produced form waste methane to actually be beneficial from a GHG perspective, leak rates along the supply chain would need to be about 1%, but we know they're much higher than that – typically ranging from 2.8% to 4.8% but observed to be as high as 15.8%.[14]

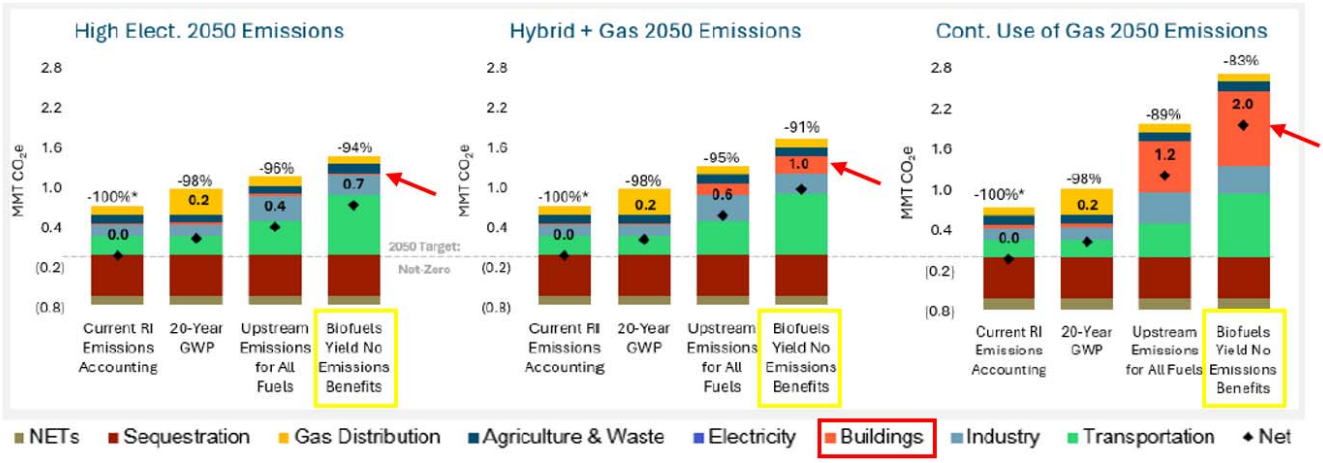
This topic of the efficacy of alternative fuels in actually reducing net GHG emissions in the state of Rhode Island, and more specifically in the state's building sector and gas distribution system, should be a central, overriding theme that is present across the FOG Policy Report and informs the eventual policy recommendations. **The degree of uncertainty surrounding the climate benefits of alternative fuels is so high, that E3 included a sensitivity analysis in their modeling titled, "Renewable fuels have no emissions benefit."[15]** E3 summarizes the results of this sensitivity analysis through the inclusion of Figure 2 (see below) and by stating, "Scenarios that rely on higher levels of electrification (e.g. High Electrification, Staged Electrification) would miss 2050 AoC targets by 6%, while the Continued Use of Gas pathway would miss targets by 17%." Based on Figure 2 below, the Hybrid With Gas Backup Scenario would miss the economy-wide 2050 target by 9%.

[13] Ibid.

[14] Ibid.

[15] E3 Report, page 46

Figure 2. Remaining Emissions in 2050 Under Alternative Accounting Frameworks"
(Figure 17[16] from E3 Report With Highlights Added by Acadia Center)



However, the above comment and figure summarizing the degree to which various scenarios would mis the 2050 AoC targets under the "zero emissions benefit from biofuels" sensitivity is focused on the degree to which the *overall RI economy* will miss the targets. Assuming Rhode Island at some point adopts subsector GHG emission reduction mandates for the building sector in line with the overall economy-wide mandate (e.g., 2050 net-zero emissions by 2050 AoC mandate translates to 95% reduction in building sector gross GHG emissions by 2050), the degree to which that Building Subsector target would be missed under scenarios modeled by E3 that rely extensively on alternative fuels is even more amplified.

For example, as Table 2 below demonstrates, using data available in the E3 report[17], the Continued Use of Gas Scenario only reduces Building Sector emissions 53% by 2050 under the "zero emissions benefit from biofuels" sensitivity. Additionally, the Buildings Sector GHG emissions reduction obtained in the Hybrid With Gas Backup Scenario (90%) falls well short of the High Electrification scenario (99%).In other words, the greater the reliance on alternative fuels as a strategy for decarbonizing the buildings sector, the greater the odds that improvements to state's current (flawed and over-simplified) GHG accounting structure for biofuels will result in Rhode Island falling short of the overarching AoC 2050 target.

[16] E3 Report, page 47

[17] Data on building sector emissions in 2050 under various scenarios utilizing the "renewable fuels have no emissions benefit" sensitivity analysis was obtained via direct measurement of Figure 17 in the E3 Report.

Table 2. Rhode Island 2020 vs. 2050 Percent Reduction in Building Sector GHG Emissions Under Three Modeled Scenarios Using E3's "Renewable fuels have no emissions benefit" Sensitivity Analysis

Scenario	2020 Building Sector Emissions (MMT CO2e)	2050 Building Sector Emissions (MMT CO2e)	% Reduction Building Sector Emissions
Continued Use of Gas	2.6	1.21	-53%
Hybrid + Delivered Fuels	2.6	0.40	-85%
Hybrid + Gas	2.6	0.27	-90%
Alternative Heat Infrastructure	2.6	0.16	-94%
Staged Electrification	2.6	0.08	-97%
High Electrification	2.6	0.03	-99%

In Order 20-80-B, Massachusetts Department of Public Utilities (MA DPU) agreed with Acadia Center's assessment of the level or risk associated with building decarbonization strategies reliant on alternative fuels. For example, the order stated:

> *"The Department rejects the recommendation to change its current gas supply procurement policy to support the addition of renewable natural gas ("RNG") to LDC supply portfolios due to concerns regarding the costs and availability of RNG as well as its uncertain status as zero-emissions fuel."*[18]

> *"In our view, more studies are required in this area to support the claim that RNG is a zero-emissions fuel. For example, a full life-cycle analysis that considers all of the emissions profiles and captures emissions gains and losses throughout the entire production process may be necessary to determine the total carbon intensity of RNG."*[19]

The High Level of Risk Associated with Underestimation of Methane Leaks From the Gas System is Key Takeaway from the E3 Report That Should be Central in Informing the Recommendations of the Policy Report

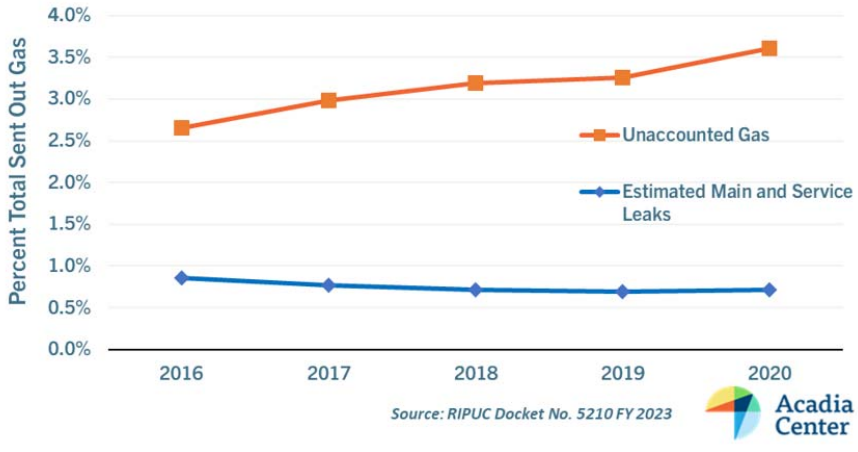
The E3 report emphasizes, but does not quantify, the high level or risk associated with the Rhode Island GHG Inventory underestimating methane leakage from the gas distribution system, not to mention behind-the-meter gas leakage which is not quantified at all by the state's GHG Inventory. The E3 Report references this topic several times, including this statement:

[18] Massachusetts Department of Public Utilities 20-80-B, page 1
https://fileservice.eea.comacloud.net/FileService.Api/file/FileRoom/18297602
[19] Massachusetts Department of Public Utilities 20-80-B, page 68
https://fileservice.eea.comacloud.net/FileService.Api/file/FileRoom/18297602

> *"Recent studies have indicated that leakage from oil and gas systems may be higher than currently reported through inventories. For example, Weller et al. (2020) estimated that national methane emissions from the gas distribution system were approximately five times greater than reported through EPA inventories.*[20] *A study published in PNAS in 2021 found that atmospheric methane measurements in the Boston area over 8 years were three times larger than calculated by usage-based inventories, observing no changes in emissions despite efforts to replace leak-prone pipes*[21]"[22]

Rhode Island-specific data on the levels of unaccounted gas in the state's gas distribution system also raise alarm bells. There is a significant disconnect between the levels of unaccounted gas reported by Rhode Island Energy (RIE) and the estimated gas main and service leak rates assumed in the RI GHG Inventory. For example, in 2020, the measure level of unaccounted gas according to RIE was 5.1x higher than the estimated rate of gas main and service leaks in the RI GHG Inventory, as depicted in Figure 3 below.

Figure 3. Rhode Island Unaccounted for Gas vs. GHG Inventory Estimated Gas Main and Service Leaks + Gas Main Replacements by Material Type



Material	% Change Main Miles: 2016-2020
Cast Iron	-12.6%
Unprotected Steel	-24.0%
Plastic	+15.9%

Furthermore, while the Rhode Island GHG Inventory methodology assumes that replacing cast iron and unprotected steel gas mains with plastic gas mains significantly reduces the level of leaks, the level of unaccounted gas according to RIE steadily increased during the 2016-2020 time period despite 13% and 24% reductions, respectively, in miles of cast iron and unprotected steel mains over that same time period. It's also worth noting that neither the unaccounted for gas figures provided by RIE nor the RI GHG Inventory methodology for estimating gas main and service leaks account for behind-the-meter gas leaks. The Sargent et al., 2021 study flags behind-the-meter gas leaks as potential significant contributor to overall methane leak rates.

[20] Footnote embedded in E3 Report quote: Weller, Z., Hamburg, S., von Fisher, J. (2020). A National Estimate of Methane Leakage from Pipeline Mains in Natural Gas Local Distribution Systems. Environ. Sci. Technol. 2020, 54, 14, 8958–8967

[21] Footnote embedded in E3 Report quote: Sargent, M., Floerchinger, C., McKain, K., Wofsy, S. 2021. Majority of US urban natural gas emissions unaccounted for in inventories. Proc Natl Acad Sci U S A. 2021 Nov 2;118(44):e2105804118. doi: 10.1073/pnas.2105804118

[22] E3 Report, page 43

This high degree of uncertainty regarding methane leaks increases the overall risk of decarbonization pathways analyzed by E3 that place a larger emphasis on blending of "renewable natural gas" into the distribution system as a supposed decarbonization solution. For example, relative to 2020 levels, total gas throughout in the Continued Use of Gas scenario only declines 45% by 2050 compared to a 95% reduction in gas throughput in the High Electrification Scenario. As shown in Table 3 below, the Continued Use of Gas Scenario sees 22.3 TBtu of methane-based gaseous fuels flowing through the distribution system in 2050, 11.7X the amount of gaseous fuel throughput in the High Electrification scenario, meaning there is 11.7X the volume of gas flowing through the system susceptible to leaks. Even the Hybrid With Gas Backup Scenario sees 3.26X the amount of gas throughput in 2050 relative to the High Electrification scenario, dramatically increasing the level of GHG emissions risk associated with methane leaks. See Table 3 below.

Table 3. Technical Analysis Appendix With Added Graph Highlights
(Table 3 from E3 Report with Acadia Center Highlights Added)

Scenario	Renewable Diesel		Renewable Natural Gas		Renewable Jet Kerosene		Renewable Gasoline		Hydrogen	
Year >>	2030	2050	2030	2050	2030	2050	2030	2050	2030	2050
High Electrification	4.4	5.5	0	1.9	0	3.4	0	0	0.2	1.8
Hybrid w/DF Backup	5.2	10.1	0.9	1.9	0	3.4	0	0	0.2	1.8
Hybrid w/Gas Backup	4.4	5.6	1.3	6.2	0	3.6	0	0	0.6	3.0
Staged Electrification	4.8	5.9	1.3	2.1	0	3.4	0	0	0.2	1.8
Alternative Heat Infra.	4.5	5.7	1.5	4.1	0	3.6	0	0	0.6	3.0
Continued Use of Gas	4.6	6.2	5.7	22.3	0	4.3	0	0.4	1.0	4.5

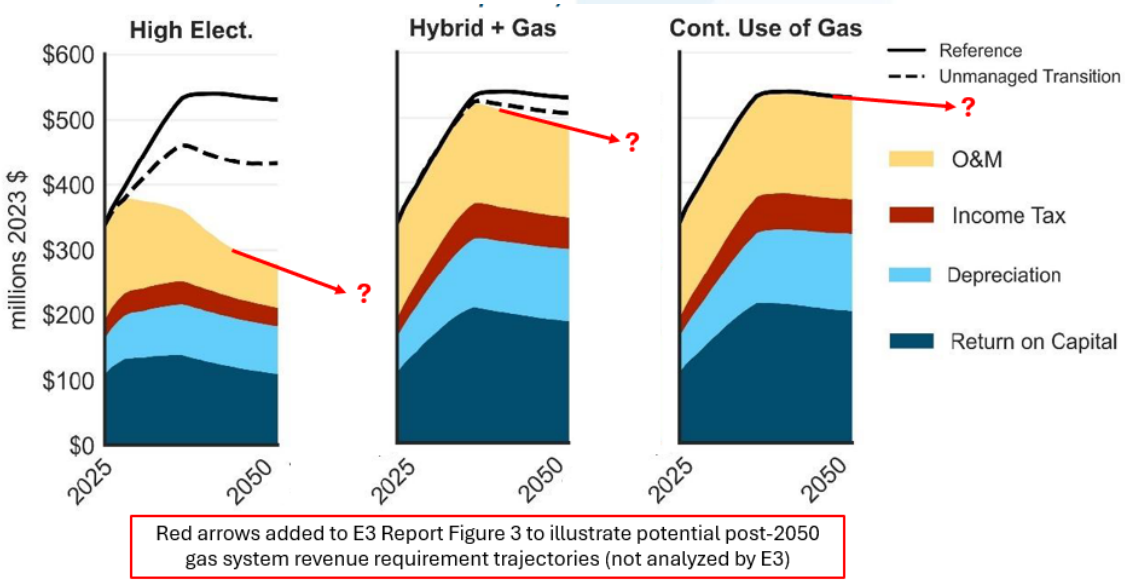
There is so much uncertainty with gas distribution and behind-the-meter methane leaks that E3 didn't even feel comfortable including a sensitivity analysis on this topic in their analysis, despite the obvious importance of the topic in guiding future policy decisions. Although not quantified by E3 in the modeling exercise, the clear high level or risk associated with a current underestimation of methane leaks should weigh heavily against scenarios, like Continued Use of Gas and Hybrid With Gas Backup, that continue to rely on a sprawling gas distribution system into the 2050s.

The High Post-2050 Total Resource Cost Associated with Scenarios That Maintain Two Energy Distribution Systems at Scale (Electricity & Gas) Indefinitely Is Not Quantified in the E3 Report But Should Be Central in Information the Recommendations of the Policy Report

Limiting the E3 pathways modeling analysis to only focus on the next ~25 years (out to 2050) was a modeling decision that significantly influences the overall results and conclusions of the E3 Report, specifically as it relates to comparisons of total resource costs across scenarios. The consequences of this modeling decision in how it influences the findings of the E3 Report, particularly in diminishing the post-2050 total resource cost implications of various pathways, should be central in informing the Policy Report.

Acadia Center, among other stakeholders, urged E3 to, at a minimum, include a qualitative narrative around post-2050 total resources costs across scenarios as part of their report, but there is no discussion of this topic in either the 122-page E3 Report or the accompanying 66-page E3 Report Technical Analysis Appendix. For example, Figure 4 below illustrates that, under the managed transition sensitivity, the High Electrification scenario has a gas system revenue requirement of $275 million in 2050, despite "less than 1,000" customers in the state remaining the gas distribution system (Figure 6 below) – in other words a revenue requirement of at least $275,000 per customer in 2050. In contrast, the Reference Scenario assumes a 2050 revenue requirement of approximately $525 million (Figure 5 below) with approximately 300,000 customers remaining on the gas system in 2050 – a revenue requirement of approximately $1,750 per customer.

Figure 4. Revenue Requirement Under a Managed Transition Based on Illustrative Cost Avoidance Assumptions (Figure 3 from E3 Report with Graph Highlights Added)[23]



[23] E3 Report, Figure 39, page 69: Red arrows added by Acadia Center

Figure 5. Revenue Requirement Under Reference Scenario (Figure 32 from E3 Report with Graph Highlights Added)[24]

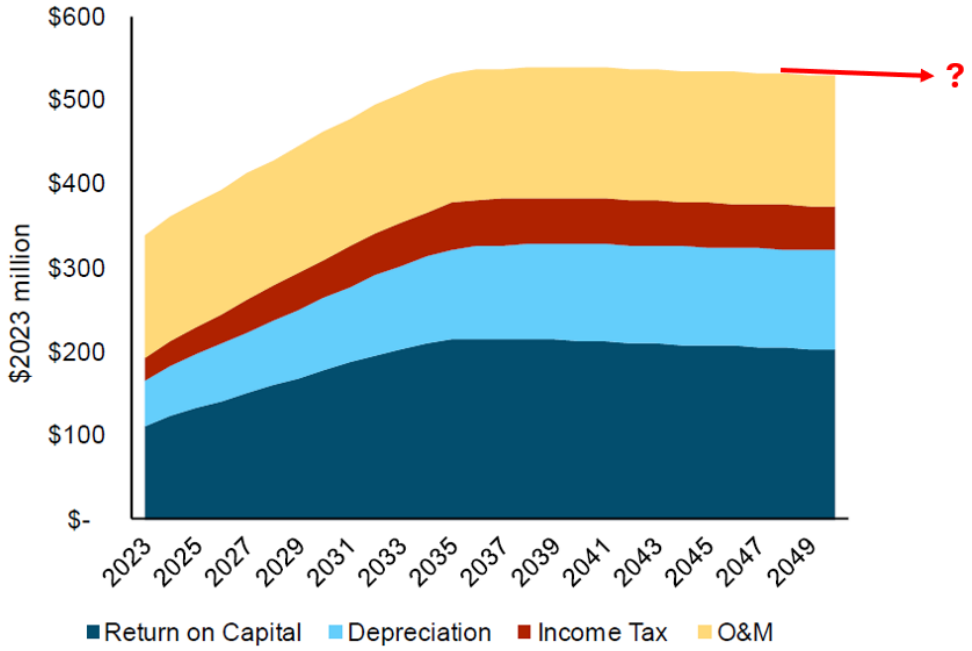
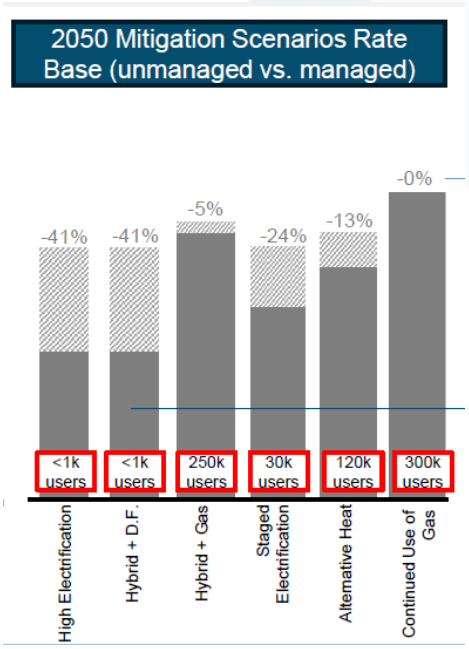


Figure 6. Customers Remaining on Gas System in 2050 Under Various Scenarios Analyzed by E3[25]



[24] E3 Report, Figure 32, page 62: Red arrow added by Acadia Center

[25] This graph was presented by E3 in slide 51 of Technical Analysis Draft Results on February 13, 2024. A similar graph showing total number of customers remaining on the gas system by scenario was not presented in the E3 Final Report or Technical Appendix, but customer numbers should be similar in the final analysis based on communication with E3 at Stakeholder Committee meetings.

In other words – despite a 99.7% reduction in the number of customers on the gas system in 2050 in the High Electrification Managed Transition Scenario, relative to the Reference Scenario in 2050, the 2050 gas system revenue requirement in the High Electrification Scenario (~$275 million) is only ~48% lower than the 2050 revenue requirement in the Reference Scenario ($525 million). **The cost savings associated with moving away from reliance on the gas distribution system and strategic decommissioning of that system are not even close to fully realized by 2050 – many of those cost savings benefits occur in the 2050-2080 time period.** The ~$275 million gas system revenue requirement in the High Electrification scenario is not a "static state condition" that would go on indefinitely post-2050. At some point in the second half of the twenty-first century, the revenue requirement would reach zero or near-zero cost levels (depending on what happens with the remaining <1,000 customers on the system).

This is a key differentiating factor between the High Electrification Scenario, and, for example, the Hybrid With Gas Backup scenario which envisions ~250,000 customers remaining on the gas system indefinitely. While it's difficult to anticipate exactly what would happen to the $490 million revenue requirement in the Hybrid + Gas Backup in 2050 (since E3 didn't model it), it's safe to say that the revenue requirement in 2075 in that scenario would be much closer to $490 million than $0 million. **The Policy Report represents a second chance to elevate a conversation around post-2050 system costs, something the E3 Report failed to do. Even if qualitative, this topic is important enough to shape nearly every policy recommendation coming out of the Policy Report – post-2050 gas system costs are a key reason to favor high electrification scenarios, and the policy recommendations should reflect that fact.**

V. Potential Mechanisms to Reduce Emissions from the Gas System

Quotas: Renewable Energy Standard or Alternative Fuels Program (including compliance with electricity, compliance with RNG, voluntary)

Acadia Center is strongly opposed to a Renewable Energy Standard (RES) or Alternative Fuels Program (AFP) that promotes the blending of RNG or hydrogen into the gas distribution system. As discussed above, chief concerns with RNG include true GHG reduction benefits under an accurate lifecycle GHG accounting framework, the lack of available supply of sustainable biomass feedstocks that provide true GHG reduction potential, a high degree of future cost uncertainty as competition for biomass feedstocks increases, and the need to prioritize limited biomass feedstocks for the production of fuels in the sectors of the economy that are most challenging to decarbonize (e.g., aviation, sipping, high-heat industrial processes, long-distance trucking).

Chief concerns with hydrogen include a lack of current and future hydrogen production capable of meeting the "three pillars" of green hydrogen production (new clean supply, hourly matching, and deliverability), the relative inefficiencies of hydrogen production via electrolysis compared to direct electrification of building heating via heat pumps, safety concerns related to the blending of hydrogen into the gas distribution system, and the need to prioritize the future, limited supply of true green hydrogen for sectors of the economy that are most challenging to decarbonize (e.g., aviation, sipping, high-heat industrial processes, long-distance trucking).

In Massachusetts, DPU 20-80-B made it clear that blending alternative fuels in the gas distribution system was not a building decarbonization strategy the state would pursue, stating:

> *"The Department rejects the recommendation to change its current gas supply procurement policy to support the addition of renewable natural gas ("RNG") to LDC supply portfolios due to concerns regarding the costs and availability of RNG as well as its uncertain status as zero-emissions fuel."*[26]

The order also referred to both RNG and hydrogen blending as a "new, unproven, and uncertain technologies."[27] Building off of DPU 20-80-B, the Massachusetts Clean Heat Standard (CHS) Draft Framework released in April, 2024, specifically made both hydrogen and gaseous biofuels ineligible under the program, stating "Alternative fuels that could be blended into existing fossil fuel pipelines would not be eligible to receive credit under the CHS at the outset."[28] Acadia Center sees no reason why Rhode Island's policy approach should differ from Massachusetts with regard to an RES or AFP that promotes blending of RNG and/or hydrogen into the gas distribution system, and urges the Policy Report to focus on policy recommendations that can advance electrification and energy efficiency at the scale needed to comply with the AoC.

Caps: Reduction of the Use of System-supplied Gas Through Mandated Limits

Emissions Caps (Measure Methane Emissions):

Regarding consideration of cap-related policies to reduce the use of system-supplied gas overtime, Acadia Center sees merit in the model that Rhode Island is familiar with in the electric power sector under the Regional Greenhouse Gas Initiative (RGGI) program. A cap-based program of this nature designed to cover the buildings sector/gas system (among other sectors) would provide several notable benefits, including: 1) greater economies of scale derived from opportunities for multi-sector coverage and multi-state participation; 2) ability to target least-cost/low-hanging fruit emissions reductions first; 3) a market-based incentive structure that internalizes social costs of emissions and promotes innovation among solution providers aiming to help customers reduce emissions from gas consumption, and the buildings sector more broadly. While Acadia Center acknowledges that elements of this type of cap-based program may be outside the jurisdiction of the PUC (e.g., with respect to emissions/air quality regulation), the Policy Report would benefit from a discussion of the value of this type of program.

Further analysis is likely needed to determine the optimal sequencing, choice, and/or relationship between cap-related programs and other significant programs such as a Clean Heat Standard (CHS), discussed further below. This evaluation can, however, draw from the experiences of several states that have implemented or are in the process of designing cap-related emissions reductions programs that include coverage of the natural gas system, including in California,[29] Washington,[30] and New York.[31] Each of these jurisdictions is approaching coverage of natural gas utilities

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[26] Massachusetts Department of Public Utilities 20-80-B, page 1 https://fileservice.eea.comacloud.net/FileService.Api/file/FileRoom/18297602

[27] Massachusetts Department of Public Utilities 20-80-B, page 71 https://fileservice.eea.comacloud.net/FileService.Api/file/FileRoom/18297602

[28] MassDEP Clean Heat Standard (CHS) Stakeholder Process Frequently Asked Questions (FAQ) Version 1.4 https://www.mass.gov/doc/chs-faq/download page 8

[29] California Air Resources Board, "Cap-and-Trade Program" https://ww2.arb.ca.gov/our-work/programs/cap-and-trade-program.

[30] State of Washington Department of Ecology, "Washington's Cap-and-Invest Program" https://ecology.wa.gov/air-climate/climate-commitment-act/cap-and-invest.

[31] New York State, "Cap-and-Invest" https://capandinvest.ny.gov/.

and customers in slightly different ways, but all three states provide informative models that can help shape Rhode Island's planning around a potential program of this nature.

Part of further analysis for Rhode Island would include the potential benefit of joining other states in participating in a broader program, in a similar fashion to RGGI – which would prevent Rhode Island from having to "go it alone" and instead benefit from the broader economic effects of a larger market. This opportunity for "linkage" between cap-related programs would be a compelling differentiator between this and other program/policy pathways, most of which would generally be confined to in-state actions alone. Under a cap program with linkage to other states/jurisdictions, emissions allowances would be obtained through centralized auctions, reducing administrative burden, and allowances could be traded between compliance entities in different jurisdictions (with appropriate rules for banking and trading, etc., as well as protections to ensure emissions reductions in underserved communities are prioritized). And finally, Rhode Island would benefit from its share of the revenue raised under a linked program of this kind, providing a sustainable stream of funds to invest in building sector decarbonization priorities (among others).

Whether in regard to linking with other states or timing the commencement of a program like this, Rhode Island could also consider "trigger" provisions that would tie the initiation of the program to certain milestones. This could include sequential triggers, such as a Clean Heat Standard (CHS)-esque program until a more optimal cap-related program is in place, or linkage triggers, which would initiate Rhode Island's cap-related program only after a multi-state program/opportunity to link is finalized.

Caps on Gas Sales (Limit Total Gas Sales):

Acadia Center supports a cap on gas sales and is interested in seeing this policy concept fleshed out, including a description of PUC regulatory authority as it relates to a potential cap on gas sales. If pursued, Acadia Center would support this policy capping gas sales at a level generally in line with the High Electrification Scenario analyzed in the E3 Report.

Administrative Moratoria – Decisions to End New Gas Connections:

As discussed above, Acadia Center agrees that a managed transition away from reliance on the gas distribution system is critical to Rhode Island pursuing the least-cost pathway to decarbonization of the building sector by 2050, as highlighted in the E3 Report and discussed in more detail above in these comments. Given that, curbing expansion of the gas system to new customers is essential in reducing the economic and climate risk associated with the building decarbonization transition – eliminating expansion of the gas system to new customers is the low hanging fruit in this transition. Acadia Center agrees with the conclusion of DPU 20-80-B that further customer expansion of the gas system should be disincentivized through revisions to the processes that determine the share of gas system expansion cost borne by new customers to the system:

> *"As to preserving customer choice, it is not clear that the Department has the statutory authority to prohibit the addition of new gas customers. It is the Department's long-standing policy, however, that an LDC need not serve new customers in circumstances in which the addition of new customers would raise the cost of gas service for existing firm ratepayers."*[32]

The Order goes on to state:

> *"When an investment needed to serve a new customer does not pass the internal rate of return test, the gas company may require the customer to pay a contribution in aid of construction ("CIAC") to make up the deficit. It thus appears that there is an opportunity to revise the process of making this cost determination, reviewing tariff provisions, and current LDC practices to disincentivize further customer expansion while still preserving customer choice to the extent necessary."*[33]

Further, Acadia Center strongly agrees with a second conclusion of DPU 20-80-B associated with gas system expansion:

> *"Finally, we agree with the Attorney General that LDCs should not be permitted to include in rates any costs associated with marketing geared toward the promotion or expansion of gas service....If and to the extent LDCs wish to continue participating in such efforts, the associated costs will be borne entirely by shareholders."*[34]

Acadia Center urges the Policy Report to include a robust discussion on regulatory reforms that avoid spreading the bulk of cost of gas system expansion across the entire gas rate base, and instead strongly disincentivize the expansion of the system through a direct economic signal to potential new gas system customers.

Decommissioning Program:

Acadia Center supports a "managed transition" approach to the gas distribution system through decommissioning of pipeline segments that are otherwise slated for replacement investment and strategically transitioning customers served by those pipeline segments to either fully electrified heat or, in some cases, hybrid electric heating arrangements that leverage a tank-fuel as a back-up heating source to mitigate peak electric demand on the grid. The E3 Report found that, "A managed transition could reduce the costs of the gas system by nearly 35%, or approximately $150 million/year compared to an unmanaged transition by 2050, primarily in scenarios that transition away from the gas system in the near term (High Electrification, Hybrid + Delivered Fuels, Staged Electrification)."[35]

Additionally, the E3 Report found that, "Planned levels of capital expenditures through the Infrastructure, Safety and Reliability (ISR) program and additional customer connections in a Reference Scenario cause annual gas revenue

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[32] Massachusetts Department of Public Utilities 20-80-B, page 58
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[33] Massachusetts Department of Public Utilities 20-80-B, page 59
https://fileservice.eea.comacloud.net/FileService.Api/file/FileRoom/18297602
[34] Massachusetts Department of Public Utilities 20-80-B, page 57
https://fileservice.eea.comacloud.net/FileService.Api/file/FileRoom/18297602
[35] E3 Report, page 110

requirement to nearly double towards 2050, assuming an unmanaged transition. Scenarios that do not assume additional customer connections reduce annual costs by approximately 20% by 2050."[36]

While Acadia Center acknowledges technical uncertainty around hydraulic feasibility of decommissioning specific branches of the gas system and the potential cost savings associated with strategic decommissioning, as discussed in more detail in the E3 Report, the cost savings potential of a managed transition is too immense for the strategy to not be one of the central elements of focus in the forthcoming Policy Report.

Economic Signals: Reduce Emissions from the Gas System Using Price

Carbon Pollution Fee:

Acadia Center interprets a carbon pollution fee in this context as a charge levied on natural gas (e.g., $/therm or $/btu) based on the amount of CO_2 released when that gas is combusted. Acadia Center is supportive of this policy concept but would like to see the concept expanded to include methane leaks associated with the distribution and use (behind-the-meter) associated with natural gas, effectively making the policy a "GHG pollution fee". Acadia Center is interested in seeing this policy concept fleshed out in the Policy Report, including a description of PUC regulatory authority as it relates to a GHG pollution fee associated with delivered natural gas, as well as authority of other relevant state agencies. With respect to the level of any fee to be designed, it would make sense to tie the fee in some way to adopted and updated federal benchmarks for CO_2e and methane emissions. In particular, it would be useful to reference and reflect the Environmental Protection Agency's (EPA) benchmarks in:

- Estimates of the Social Cost of Greenhouse Gases (SC-GHG) report from December 2023, which found that each ton of CO_2 emitted into the atmosphere costs society $190, or almost four times higher than the government-wide estimate of $51 per ton,[37] and

- The Waste Emissions Charge rulemaking pursuant to the Methane Emissions Reduction Program included by Congress in the Inflation Reduction Act (IRA) of 2022, which will ultimately apply a fee to certain methane emissions occurring in year 2024 at $900 per metric ton of methane, increasing to $1,200 per metric ton of methane in 2025, and to $1,500 per metric ton of methane in 2026 and in the years after.[38]

Finally, Acadia Center notes that the discussion above on cap-related program options also relates to this concept of a carbon pollution fee, albeit assessed on the unit of emissions ($/MMTCO2e) rather than on the unit of gas consumed ($/therm or $/btu) – but nonetheless represents another means of using a price signal to help reduce emissions.

Clean Heat Standard:

Acadia Center generally supports the concept of a clean heat standard as a mechanism for encouraging building electrification and efficiency improvements at scale and encourages the CHS concept to be fleshed out in the Policy

[36] E3 Report, page 110

[37] https://www.epa.gov/environmental-economics/scghg.

[38] https://www.epa.gov/inflation-reduction-act/waste-emissions-charge.

Report. Based on our involvement at the Stakeholder Committee meetings, it is our understanding that a CHS could broadly take two forms in Rhode Island:

- 1) A "gas only CHS" that exempts delivered fuels (e.g., propane and heating oil) from compliance, similar to Colorado's CHS or

- 2) An "all fuels CHS" that encompasses both natural gas and delivered fuels, similar to the CHS Draft Framework currently proposed in Massachusetts.

More details from Apex and PUC staff on PUC jurisdiction as it applies to a CHS that would encompass, either directly or indirectly, both gas and delivered fuels would be helpful for stakeholders commenting on this topic. Acknowledging the regulatory uncertainty, **Acadia Center strongly prefers a CHS that encompasses both natural gas and delivered fuels to a CHS that narrowly focuses on gas, particularly given that fuel oil and propane are used by about one third of Rhode Islanders for spacing and water heating in buildings, meeting almost 40% of Rhode Island's heating demand.**[39]

Acadia Center has been deeply involved in the CHS development process in Massachusetts – submitting detailed December 2023 comments responding to the release of the Draft Framework and detailed April 2024 comments responding to proposed potential changes to the Draft Framework. These comments provide our nuanced take on policy design principles and concerns with the Draft Framework, as proposed, in Massachusetts that could be helpful in informing the CHS design concepts included in the RI FOG Policy Report. Below is a list of core policy design principles that we recommend for any state, including Rhode Island, considering a CHS:

- **Biofuels and Hydrogen Should be Ineligible:** These fuels should not be eligible for the generation of clean heat credits due to this high degree of risk associated with building decarbonization strategies that rely on either of these fuels, as discussed in greater detail above in these comments.

- **Limit Program to Electrification and Energy Efficiency:** Building electrification (space heating, water heating, cooking, clothes drying, other commercial/industrial combustion end uses) and building envelope efficiency improvements should be the only measures eligible for generation of credits. If energy efficiency is included as an eligible measure, high levels of coordination between a CHS and Rhode Island's existing energy efficiency program design will be required to avoid overlap and redundancy.

- **Avoid Obligation on Electricity Sellers/ Electric Utilities:** The program should avoid putting a compliance obligation on electricity utilities, as this obligation will apply upward pressure on electric rates and be counterproductive in encouraging end user electrification. The compliance obligation should be limited to natural gas, heating oil, and propane industries.

- **Center Equity:** The CHS should use policy design mechanisms to ensure that at least 40% of the revenue generated by the CHS is invested in improvements that directly benefit environmental justice

[39] EIA, 2020 Residential Energy Consumption Survey (RECS)

communities. The program should also be designed in a manner that does not unjustly increase the cost of energy for these same communities.

- **Link Alternative Compliance Payment Value to Social Cost of Carbon:** The program should include an "alternative compliance payment" (ACP) compliance option, but the price of ACPs should be set in line with the $190 per MT CO_2e societal cost of carbon US EPA estimate, recently enshrined in legally binding federal regulation.[40] The program should also set a cap on the overall percent of obligated party compliance that can be met via ACPs, opposed to tangible installs of electrification and energy efficiency projects.

- **Set Compliance Obligation in Line with AoC Overall Targets:** The CHS compliance obligation should be set at a level that results in a decline in building sector GHG emissions that approximates the overall pace of economy-wide GHG emissions decline mandated by the AoC, a topic discussed in more detail above in these comments.

Acadia center urges the Policy Report to take the above CHS policy design considerations into account.

Pay-to-Stay:

Acadia Center urges the Policy Report to include a recommendation around prohibiting the use of exit fees for customers who choose to leave the gas system and electrify. Gas utilities around the country have attempted to charge customers exit fees when they disconnect from gas service in order to make up for lost future revenues from that customer. These fees add to what can already be high financial barriers to electrification and punish customers who are trying to do the right thing by reducing their fossil gas consumption. Financially penalizing customers with exit fees, and therefore making it harder to electrify, is the opposite of what Rhode Island should be doing to support broad electrification, and we urge the Policy Report to express strong opposition to the use of exit fees.

We also recommend that the Policy Report include a recommendation for reforming the gas utility's obligation to serve, which creates a major barrier to the accelerated transition away from gas. For instance, customers could have a legal right to *energy*, not a right to *gas* specifically. Existing line extension allowances policies are informed by gas utilities' obligation to serve, and by reforming obligation to serve, Rhode Island could eliminate a significant barrier. Notably, California and Colorado eliminated gas line extension allowances statewide after finding that they no longer provided a net benefit to *existing gas customers*.[41,42]

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[40] EPA EPA Report on the Social Cost of Greenhouse Gases: Estimates Incorporating Recent Scientific Advances https://www.epa.gov/system/files/documents/2023-12/epa_scghg_2023_report_final.pdf

[41] California Public Utilities Commission, "Phase III Decision Eliminating Gas Line Extension Allowances, Ten-Year Refundable Payment Option, and Fifty Percent Discount Payment Option under Gas Line Extension Rules, Decision 22-09-026," Rulemaking 19-01-011, September 15, 2022.

[42] S.B. 23-291, *An Act Concerning The Public Utilities Commission's Regulation Of Energy Utilities, And, In Connection Therewith, Making An Appropriation* (2023).

Company Facing

Acadia Center strongly suggests that the Policy Report include a recommendation that no new cost recovery for capacity expansion projects or replacement or repair investments should be provided unless a full non-pipeline alternatives (NPA) assessment has been conducted. NPAs, such as electrification, energy efficiency, and demand response, can help to reduce system costs, avoid future stranded assets, and reduce emissions. The gas utility should bear the burden of demonstrating that NPAs were adequately considered and found to be non-viable or cost prohibitive in order to receive full cost recovery for capacity expansion projects or replacement or repair investments. This policy would align with that articulated in the Massachusetts DPU 20-80-B Future of Gas Order.[43]

Acadia Center recommends the use of accelerated depreciation for gas distribution infrastructure. By using a different approach to depreciation, gas assets would be more likely to reach the end of their useful lives after they are fully depreciated and would avoid becoming a stranded asset. Alternatively, regulators could continue to use traditional depreciation period lengths but adjust the depreciation schedule to recover a greater share of asset costs in the early years of the depreciation period. In light of project decreases in gas demand in the future, front-loading the recovery of gas asset costs in the earlier years of an asset's useful life would allow for costs to be spread over a larger volume of gas sales today. This can reduce the risk of stranded asset costs being applied to an increasingly small customer base in the future.

Acadia Center also urges a cautious approach to any potential reform of gas revenue decoupling. Revenue decoupling is an essential policy tool and must not be weakened. Existing Strategies That Can Support Meeting Goals to Reduce Natural Gas Use

Least Cost Procurement

While the System Reliability Procurement (SRP) process has made notable improvements in recent years, we urge Apex to include any recommendations to improve the existing process so that both NWA and NPA become business-as-usual investments for utilities, rather than ad hoc considerations. Connecticut's Non-Wires Solution (NWS) program provides a useful example for a robust framework for identifying non-traditional investments. The NWS program includes an independent Process Monitor that oversees the identification and solicitation process. The Public Utilities Regulatory Authority (PURA) requires electric distribution companies in Connecticut to file a robust set of annual distribution system, financial, and DER deployment data. By increasing data transparency and establishing rules that enable the participation of third-party solution providers, Connecticut's NWS program is designed to make NWS business-as-usual and to deliver a broad set of benefits for customers. Rhode Island could draw lessons from the Connecticut example and apply them to the existing SRP process as relevant both to the non-wires and non-pipe alternatives.

Fuel Switching That Reduces Gas System Emissions Consistent with the Act, But Not Rhode Island Emissions Consistent With The Act (Oil & Propane)

Acadia Center is not entirely clear why this topic is nested under "Existing strategies that can support meeting goals to reduce natural gas use" within the outline, but nonetheless, we strongly encourage the Policy Report to focus on

[43] Massachusetts Department of Public Utilities 20-80-B, page 2
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policies and programs that simultaneously reduce both gas system emissions and building subsector emissions consistent with the AoC, whether they be modifications to existing policies/programs or entirely new policies/programs. While Acadia Center acknowledges that the PUC does not have direct regulatory authority over delivered fuels, it is important to consider the impacts of proposed policies and programs through the lens of both regulated and unregulated fuels. Consumers in Rhode Island have access to four main heating fuels – electricity, natural gas, heating oil and propane – and policies impacting the costs of the two fuels regulated by the PUC clearly have the potential to impact consumer choices in switching from PUC-regulated fuels to delivered fuels, or vice versa.

A poorly designed Clean Heat Standard (CHS) serves as a prime example of a program that could have unintended consequences in terms of both electric to delivered fuels customer fuel switching and gas to delivered fuels switching. For example, implementing a CHS that places an obligation on electricity sellers and gas sellers, but places no obligation on delivered fuels, would put upward price pressure on electric and gas rates, while simultaneously having little to no impact on the cost of delivered fuels. Dependent on the specific program design parameters, this type of CHS could trigger significant levels of electric to delivered fuel and gas to delivered fuels fuel switching, a policy outcome that is clearly at odds with the overarching AoC goals. For this reason, Acadia Center strongly encourages the Policy Report to examine every policy and program discussed in the report through this unintended impact on delivered fuels lens.

Mitigation Mechanisms to Smooth Transition, Rate Impacts, Equity, etc.

Securitization/Long-term Government Takeover

Acadia Center supports the use of securitization as one key tool to reduce the size of stranded costs over time. By bundling gas distribution assets and issuing ratepayer-backed bonds to investors to cover the remaining costs of an asset over time, securitization can be a useful refinancing tool to help recover stranded costs in a less expensive way. There is, in fact, already precedent for the use of securitization in Rhode Island; securitization was widely used during the electric restructuring period in the mid- to late-1990s. Moreover, the PUC already has statutory authority to implement securitization as a result of the Rhode Island Utility Restructuring Act of 1996.

Securitization can help to accelerate gas distribution system decommissioning and provide savings for ratepayers. The issued bonds (i.e. securitized debt) have a much lower interest rate than the utility's cost of capital (i.e. the interest on utility debt and equity). Ratepayers are extremely good at paying their utility bills, so the bonds would be very low risk for investors, and interest rates would be low. The utility would receive upfront recovery of the costs, allowing it to make new investments, and would preserve utility credit. Shareholders would no longer earn a profit (i.e. rate of return) on the assets because the assets are removed from rate base, but neither would they have to absorb the remaining costs.

Transition Fees/Decommissioning Fees

Acadia Center supports the general concept of a transition fee or decommissioning fee applicable to existing natural gas customers that would help cover future costs associated with the transition away from the gas distribution system. This is one potential tool in the portfolio of policy options for funding the transition that should be explored in more depth in the Policy Report. The general concept behind the policy is sound – Rhode Island currently has a large number of customers on the gas system but, over time, the number of customers connected to the system will decline (potentially sharply) over the next two decades, as evidenced by many of the scenarios explored in the E3 Report. Applying a relatively small fee in the near-term on the large number of existing gas customers is a reasonable

mechanism for funding the transition that helps to mitigate the risk and inequality associated with a future condition wherein a small number of customers remaining on the gas system are burdened with all (or nearly all) of the costs associated with the gas transition.

Integrated Planning

Integrated gas-electric planning is essential for the successful transformation of Rhode Island's energy system as the state works to meet its emissions reduction and affordability goals. The Massachusetts DPU 20-80-B Order provides a useful model for how this could work in Rhode Island and describes why it is important:

> *"The [DPU] agrees that coordinated and comprehensive planning between electric and gas utilities is needed to facilitate the energy transition. Gas and electric infrastructure planning will be necessary as consumers transition from using fossil fuel-based heating systems to electric heat pumps. We note that going forward, evaluation of any proposed investments will have to take place in the context of joint electric and gas system planning. The Department emphasizes that joint electric and gas utility planning must occur in a broad stakeholder context so that the LDCs and electric distribution companies exclusively are not defining the process and outcome."*[44]

Acadia Center recommends that the Policy Report emphasize the importance of coordinated electric-gas planning and include a recommendation for the PUC to establish a stakeholder process to develop a coordinated planning framework.

Additional Supporting Policies

Workforce Development:

In the context of the gas system transition, one of the most important related planning dimensions for a just and equitable transition relates to protections and support for existing gas workers who may be affected under differing levels of system decommissioning and downsizing. This includes an array of related workforces and specialties, from those employed directly by the gas utility and contractors with expertise in trenching or equipment operation, to plumbers and pipefitters working at the edge of the gas network on connections to and inside buildings and other end-use infrastructure. Many of these jobs are good paying, high road occupations, and Rhode Island must strive to do right by these workers and ensure they have access to meaningful protections and support throughout the transition. There may well be strong retraining opportunities presented by expected growth in clean energy occupations resulting from Rhode Island's AoC transition, although new clean energy jobs created do not represent perfect '1-for-1' reemployment opportunities for existing fossil fuel workers in all cases.

To inform the scope of these planning priorities, additional analysis on the makeup of the existing gas workforce will be critical to develop and implement a set of protections tailored to Rhode Island's unique needs. As that analysis is conducted, it should draw wherever possible on direct information from Rhode Island Energy and major gas contractors about their workforces. Nonetheless, in parallel, Rhode Island should also begin to crystallize and advance a more general set of protections and support for affected workers. These efforts can encompass elements such as:

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[44] Massachusetts Department of Public Utilities 20-80-B, page 131
https://fileservice.eea.comacloud.net/FileService.Api/file/FileRoom/18297602

direct displaced worker support, including continuing education, Registered Apprenticeships, certifications, and licensing in trades and professions for current workers; tailored offerings such as programs creating a bridge to retirement for displaced workers nearing retirement age; protections to preserve union affiliation and seniority levels; transitional unemployment benefits and continuation of health coverage; and opportunities for retraining and retention, including within other business unit affiliates of the utility company; among other potential priorities. Workers themselves should of course have a prominent voice in helping ultimately shape the development of protections and support to match their specific needs.

Since the E3 Report did not quantify the local economic impacts of various scenarios, including job creation, across the scenarios, it's important to lean on other studies that did to inform the workforce impacts discussion in the Policy Report. For example, **the Massachusetts Decarbonization Roadmap Study found that pathways that invested in local energy resources, including renewable electricity generation and energy efficiency, created more jobs and demonstrated greater economic benefits by keeping money local than the pathways more reliant on imported energy.** For example, the "All Options" pathway from the Roadmap (which emphasized deep electrification and broad renewable electricity buildout) had 17% higher economic "output" (the broadest measure of economic activity) in Massachusetts per dollar invested than the "Pipeline Gas" pathway (which relied heavily on imported alternative fuels). [45]

However, quantifying the local economic and jobs impact of various scenarios was deemed out of scope in E3's analysis. This is extremely problematic when you step back and think through some of economic ramifications of the various scenarios posed by E3. **Scenarios that rely heavily on RNG, including Continued Use of Gas and Hybrid With Gas Backup, would wind up importing the majority of this RNG from outside of the region.** As the E3 Report describes it:

> *"Several studies estimate that New England is likely to have one of the lowest levels of biomass resources available for conversion into renewable fuels in the United States.[46] Scenarios that rely heavily on renewable fuels are therefore likely to source these fuels from out of region. While the import of fuels for energy purposes is common in Rhode Island today, this means that scenarios with higher levels of renewable fuels to serve heating demand are more likely to continue to rely on out-of-region resources in contrast to scenarios with higher levels of electrification that transition more strongly to in-region supply of energy for heating purposes. In particular, it is likely that the capital investments necessary to produce renewable fuels will occur out of region, while Rhode Island continues to rely on local infrastructure to deliver these fuels."*[47]

[45] Massachusetts Decarbonization Roadmap, Economic and Health Impacts Report, Table 3, page 13 https://www.mass.gov/doc/economics-and-health-impacts-report/download

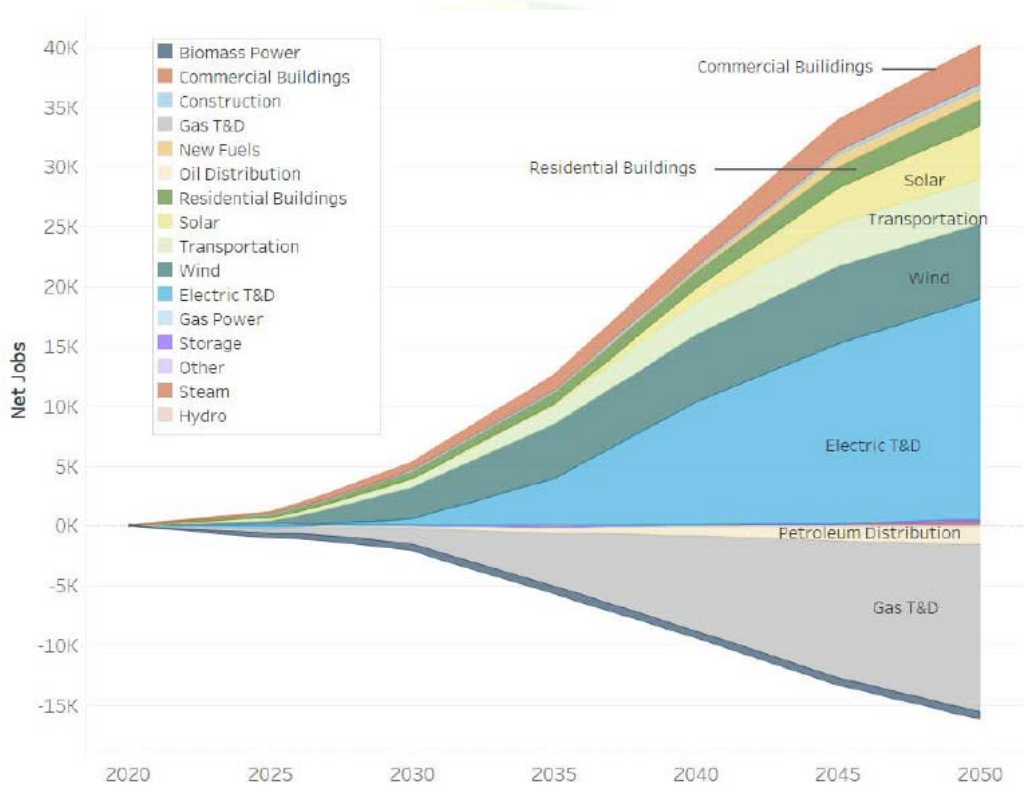
[46] See, for example: US DOE (2016). Billion Ton Report; M.J. Bradley (2019). Renewable Natural Gas: Potential Supply and Benefits; American Gas Foundation, prepared by ICF (2019). Renewable Sources of Natural Gas: Supply and Emissions Reduction Assessment.

[47] E3 Report, page 103

Biomass resource availability in New England is, on a per capita basis, about 25% that of the national average according to E3's analysis in MA DPU 20-80 (0.63 dry tons per person per year in New England vs. 2.47 nationally).[48] In summary, in the E3 analysis, a reliance on both hydrogen and RNG means sending large amount of ratepayer dollars and job out of state.

Alternatively, scenarios like High Electrification do a better job of keeping money local by investing more aggressively in energy efficiency, local renewable electricity generation, and electricity system transmission and distribution buildout. The job-creation benefits of the MA Roadmap's "All Options" pathway, which relies heavily on building electrification, are demonstrated in Figure 7 below.

Figure 7. Net Change in Directly Created Jobs by Year for the Massachusetts Decarbonization Roadmap All Options Pathway[49]



Scenarios that place a larger emphasis on the utilization of heat pumps also leverage locally available resources, heat in the Rhode Island's air and ground, and renewable energy gathered from the sun and wind for usable energy. Again, the downside of a continued reliance on imported energy is just simply not quantified in the E3 analysis, but nevertheless, should be a core consideration in informing the ultimate recommendations of the Policy Report.

[48] MA 20-80 Independent Consultant Report, Appendix 1, page 16

[49] Massachusetts Decarbonization Roadmap, Economic and Health Impacts Report, Figure 7, page 14 https://www.mass.gov/doc/economics-and-health-impacts-report/download

Building Codes and Standards:

The Policy Report should emphasize the need for all-electric building codes as soon as possible in order to minimize the overall costs associated with the building decarbonization transition. It's widely accepted that new construction represents the low-hanging fruit of building electrification – it's simply less expensive to build a new building all-electric than to retrofit an existing building. The Massachusetts 2050 Decarbonization Roadmap summarized this point, stating:

> *"New construction offers the easiest and most economically attractive way to start decarbonizing the buildings sector and will have lasting impacts. The implementation of a high-performance, net-zero emissions building energy code will minimize the near-term installation of additional fossil fuel equipment that would require, in the mid- or long-term, either costly zero-carbon fuels, emissions allowances, or early retirement."*[50]

For every code cycle in which the Rhode Island delays the inevitability of all-electric codes for new construction, and residential construction in particular, it will result in more "GHG mitigation slack" needing to be picked up somewhere else to stay on track to achieving net zero by 2050 - for example, necessitating deeper, more expensive retrofits to existing buildings or conversion of existing buildings to all-electric appliances before their existing fossil fuel appliances reach "end of life."

While a common critique of all-electric buildings it that they both cost more to construct and cost more to own, that is not necessarily the case. For example, in Massachusetts, the "Summary of Stretch Code Study Energy Efficiency Analysis" shows that **for all four types of low-rise residential building types, choosing all-electric both results in construction cost savings for builders and annual cost savings for homeowners when compared to a natural gas home with the same HERS rating.**

Table 4: Cost Savings of HERS 42 All-Electric Home Compared to HERS 42 Gas Home From Massachusetts Stretch Code Analysis[51]

Home Type	Construction Cost Savings	Homeowner Net Annual Cost Savings
Large Single Family	$23,245	$246
Small Single Family	$36,504	$1,549
Townhouse	$12,740	$356
6-Unit Multifamily	$17,967	$669

For example, the MA DOER analysis estimates that an all-electric small single-family home with a HERS 42 rating will cost a builder over $36,000 less to construct than the same building with natural gas appliances. The same all-electric home would cost a homeowner over $1,500 less annually to own than a similar home with natural gas appliances. This is great news for all residents, but particularly low-income residents for whom housing affordability is a major

[50] Massachusetts 2050 Decarbonization Roadmap: page 52 https://www.mass.gov/doc/ma-2050-decarbonization-roadmap/download

[51] DOER: Summary of Stretch Code Study Energy Efficiency Analysis, February 2022, Slides 13 & 14 https://www.mass.gov/doc/summary-of-stretch-code-study-energy-efficiency-analysis-feb-2022/download

concern. In addition, DOER's own analysis shows that even by 2030, while before the grid in Massachusetts becomes carbon neutral, residential buildings built to an all-electric standard will release nearly 75% less GHG emissions than an equally efficient gas home. For these reasons, the policy should specifically call on the RI Office of Energy Resources (OER) to adopt all-electric new construction requirements in the next code cycle. The status quo adoption of IECC code will not be sufficient for achieving the state's climate mandates in the AoC, while simultaneously minimizing the total cost of the building decarbonization transition.

Simultaneously, Rhode Island would also benefit benchmarking and a building performance standard to ensure the largest buildings in the state are reducing emissions. The state would additionally benefit from zero-emission standards on space heating and water heating equipment. Although these policy mechanisms are beyond the PUC's authority, the report should state the importance of these policies in the transition away from gas. Without such policies, gas consumption will continue to rise at rates that are at odds with the AoC mandates.

Other Topics Not Specifically Addressed in Draft Outline

The Creation of an Office of Energy Transformation Would Help to Accelerate the Building Decarbonization Transition

Navigating the phase-out of the sprawling natural gas system is a massive and complex undertaking, filled with thorny questions that could likely be the subject of years-long proceedings. To address this task, Massachusetts recently created the first-ever Office of Energy Transformation, tasked with a duty "to accelerate the energy transformation, with a focus on gas-to-electric transition, electric grid readiness, and an affordable and just transition for workers, businesses, and communities." This office is intended to provide leadership in strategic planning, roadmap development, and stakeholder engagement to advance the transformation of the state's energy delivery ecosystem. Put simply, this Office is tasked with navigating those incredibly complicated questions that surround the transition, like how to decarbonize the peak and how to finance the transition. This Office functions as an invaluable connective tissue between the various branches of government and stakeholders. Rhode Island would benefit from the creation of a similar office.

Performance-Based Rate Design

A robust set of performance metrics, penalties, and incentives can help support the achievement of Rhode Island's gas transition goals. Acadia Center recommends that the Policy Report include a recommendation for the PUC to investigate and implement a Performance-Based Regulation framework for the gas sector. A broad PBR framework can further accelerate the aims of the Future of Gas proposal overall and ensure that utility financial incentives are aligned with ratepayer interests.

Recommendations Must be Holistic & Actionable

A successful building decarbonization transition in Rhode Island cannot be achieved strictly through PUC action – it will require coordinated action from the Governor, Executive Branch Agencies, the General Assembly, and the PUC given the breadth and complexity of the transition. For this reason, it is essential that the Policy Report, when discussing potential policy solutions, must clearly articulate which policy options are within and outside PUC jurisdiction. The Policy Report would benefit from identification of key policies and programs outside of PUC jurisdiction, identification of the entity best suited for advancing the policy or program, and a discussion of how a particular policy or program that falls outside of PUC jurisdiction would complement policies and programs that do

fall within PUC jurisdiction. For example, the report could articulate the pros and cons of implementing a CHS program implemented without additional legislative action versus an alternative CHS program design that does rely on legislative action, and perhaps take a more holistic approach to incorporating delivered fuels into the program.

Conclusion

Thank you for the opportunity to submit written comments. If you have any questions or concerns, please do not hesitate to reach out.

Sincerely,

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