

November 18, 2024

Governor's Energy Office
Via email geo@maine.gov

Re: Acadia Center comments on *Maine Pathways to 2040: Analysis and Insights* Draft Technical Report

To the Governor's Energy Office and report authors:

Acadia Center appreciates the opportunity to provide written comments on the Draft Technical Report for *Maine Pathways to 2040: Analysis and Insights* ("Draft Technical Report"). Acadia Center agrees with the Governor's Energy Office (GEO) that successful development and implementation of Maine's Energy Plan will not be possible without continued public input and engagement. Acadia Center is a Rockport, Maine-based nonprofit that plans, advocates for, and seeks implementation of clean energy solutions across New England and Eastern Canada.

Acadia Center appreciates the extensive work conducted to develop the Draft Technical Report by the Brattle Group and Evolved Energy Research (Consultants). Maine has set ambitious goals for clean electricity deployment and economy-wide decarbonization. It is entirely appropriate and necessary that Maine move forward with all due speed, given that climate change is already fueling storms that have wreaked havoc on Maine communities and devastated Maine businesses. But, the swiftness of the action Maine must take must be grounded in comprehensive analyses, so the Draft Technical Report and the broader 2040 pathways effort are essential to ensuring a sound trajectory for Maine's progress on clean energy, grid investments, and emissions reductions across sectors.

Overall, Acadia Center appreciates the thoroughness and rigor of the Draft Technical Report, which recognizes the importance of clean, renewable energy from resources like solar and wind in reaching Maine's renewable energy goals, and the importance of continuing to promote and implement proven solutions across all sectors of the economy, such as heat pumps, weatherization, and electric vehicles. Acadia Center is heartened by the Draft Technical Report's findings that energy supply costs will decrease in a renewable future, highlighting a major opportunity to deliver savings to ratepayers in the move away from expensive and volatile fossil fuel-based supply. We recognize that Maine ratepayers have suffered in recent years from increasing electricity bills – especially acute in disadvantaged communities. The long-term cost projections do not obviate the urgent need to take action to provide energy burden relief through clean energy solutions and other supports.

The Consultants have been tasked with providing and analyzing options to reach Maine's energy and decarbonization goals. Maine policies and programs to promote renewable energy must be continued and strengthened in light of this report's findings, especially given the projected increases in end-use electrification over the next two decades. At a high-level, we are pleased with and supportive of the "Core" pathway results presented in the Draft Technical Report, although we do have concerns regarding some fuels and approaches included in the Core pathway modeling as well as other scenarios, such as renewable natural gas (RNG), biomass, hydrogen, clean thermal, and hybrid heat. While these options may play limited but meaningful roles in the long-term, they are not likely to provide meaningful

contributions of emissions reductions in the near-term/next decade. All of them require to some extent the development and implementation of unproven, complex and expensive solutions, and none has been demonstrated to lower energy costs. In addition, their environmental benefits are currently unproven, making emissions reductions projections difficult to rely on. Indeed, hybrid heat, which would use heating fuels to mitigate peak electric loads, will require (as recognized in the Draft Technical Report) increased customer equipment costs, changes in customer behavior, and a greater supply of both biofuels and synthetic fuels. Recent Climate Council discussions about the pathway to 2030 have also highlighted these uncertainties. At the same time, targeted reliance on delivered fuels may be preferable to maintaining an extensive natural gas distribution system and associated demand through the 2040 timeframe.

While pursuing long term goals, the GEO should focus on enhancing proven programs and policies that are already producing and procuring over 6,000 GWh of renewable electricity per year in Maine. Acadia Center provides the following recommendations and comments on specific elements of the Draft Technical Report:

Maintain Focus on 80% Reduction in Gross GHG Emissions Below 1990 Levels by 2050

Maine has two, key overarching long-term GHG reduction targets - 38 M.R.S. §576-A established a binding target of an 80% reduction in gross GHG emissions below 1990 levels by 2050, and L.D. 1429 established a binding target of net zero emissions by 2050. In many states, these targets would be roughly comparable – for example, many states aim to achieve an 80%-90% reduction in gross emissions and then “net out” the remaining 10-20% of gross emissions via carbon sequestration or carbon removal strategies. However, due to the immense carbon sequestration potential of Maine relative to its population, and the net GHG accounting the State is currently employing, these two targets (80% gross reduction and net zero) have very different implications for the future gross GHG emissions trajectory of Maine. As the Draft Technical Report highlights, Maine has reduced gross emissions 25% below 1990 levels (as of 2019 GHG Inventory), while, simultaneously, the state is “75% of the way towards achieving carbon neutrality” based on preliminary estimates by DEP (2016 GHG Inventory). In other words, Maine is relatively close to achieving carbon neutrality (according to the accounting methodology the State has chosen to use) but still has much work to do to achieve the 80% by 2050 gross emissions target. As the Draft Technical Report highlights, achieving the 80% gross target will require transformational change across all sectors of the economy. Without transformational change, the State may be able to achieve its net zero target but will not be able to achieve its 80% gross target. For this reason, Acadia Center stresses the importance of continuing to rely on the 80% gross emission target as the “North Star” for energy and climate programs and policies in the state, as the Draft Technical Report modeling has done.

Pathways Reliant on ‘Clean Fuels’ Face Significant Levels of Risk From Multiple Angles

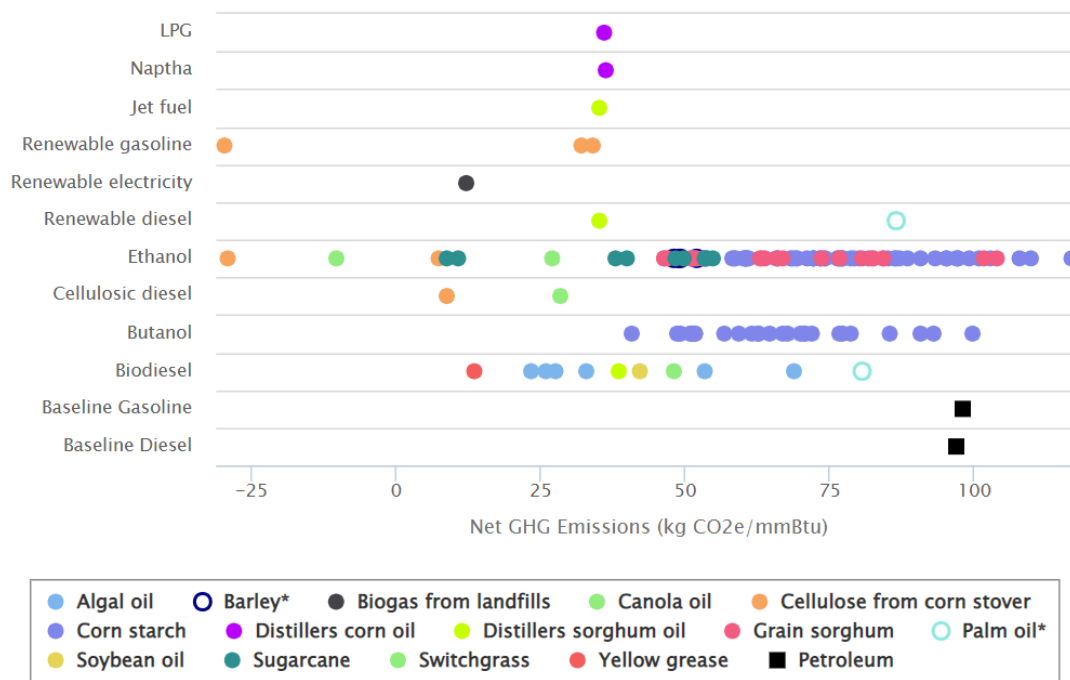
The Draft Technical Report considers the use of “clean fuels” (Acadia Center prefers the umbrella term “alternative fuels”) as a decarbonization strategy for power generation, transportation, and building heating sectors. While the Draft Technical Report does address the risks associated with reliance on alternative fuels, the Report would have benefited from more robust discussion of the multitude of risks associated with alternative fuels.

The risks associated with alternative fuels, including renewable natural gas (RNG), is so high that, in [Order 20-80-B](#), the Massachusetts Department of Public Utilities (MA DPU) 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.”¹ MA DPU expressed equal concerns with hydrogen as a decarbonization strategy, stating, “LDCs may research and assess these technologies [RNG and hydrogen], but **until they prove to be a viable alternative to the business-as-usual model and support the Commonwealth’s climate targets**, any infrastructure costs associated with RNG and hydrogen will be the sole responsibility of the utility shareholders and not their customers.”

While the MA DPU is narrowly focused on gaseous alternative fuels (RNG, hydrogen), the same high level of risk related to their actual ability to reduce GHG emissions, limited supply, and high costs applies to liquid alternative fuels. The assumption that biofuels are GHG-neutral hinges on ignoring many of the lifecycle emissions from biofuels. One of the key limitations of Maine’s GHG Inventory is that lifecycle emissions from biofuels are not included. This is a over -simplification of a complex issue, as the EPA’s Renewable Fuel Standard demonstrates (see Figure 1 below).² 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 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 Type³



¹ Massachusetts Department of Public Utilities 20-80-B, page 1

<https://fileservice.eea.comacloud.net/FileService.Api/file/FileRoom/18297602>

² EPA “Lifecycle Greenhouse Gas Results” <https://www.epa.gov/fuels-registration-reporting-and-compliance-help/lifecycle-greenhouse-gas-results>

³ EPA “Lifecycle Greenhouse Gas Results” <https://www.epa.gov/fuels-registration-reporting-and-compliance-help/lifecycle-greenhouse-gas-results>

The Draft Technical Report acknowledges some of this risk. For example, it states, “*It will be important to understand the extent to which these ‘clean’ fuels are actually low/zero-carbon, according to a lifecycle analysis that accounts for emissions during production, transportation, and use.*” However, note that the report does not provide specific guidance on what lifecycle analysis methodology should be implemented by the State to effectively verify these fuels have climate benefits and does not outline steps the state should take to ensure hydrogen produced in-state complies with the ‘[three pillars](#)’ of hydrogen production (new clean supply, hourly matching, deliverability). These accounting and verification procedures are not afterthoughts and are essential in ensuring alternative fuels are actually helping the state achieve its overarching climate objectives.

The Draft Technical Report does not effectively address the many pitfalls associated with currently lifecycle accounting methodologies. Many will point to the GREET model or the lifecycle accounting methodology used by EPA to inform the Federal Renewable Fuel Standard (RFS) as reputable lifecycle accounting frameworks, but there is wide disagreement among experts as to the accuracy of both frameworks. For example, the RFS still incentivizes corn ethanol based on the claim of lifecycle GHG emission benefits despite wide opposition from experts in the field. For more information on Acadia’s Center concerns regarding currently lifecycle accounting methodologies for biofuels, please see our [Massachusetts Clean Heat Standard Draft Framework comments](#) from December 2023, pages 4-7.

The Draft Technical Report also frames the Rhode Island biodiesel blending law, which requires all delivered heating oil to achieve 50% biodiesel blend levels by 2030, as a potential model policy for Maine. What the Draft Technical Report fails to mention is that there are zero policy guardrails in that Rhode Island policy to ensure those biodiesel blends are actually effective in reducing emissions on a lifecycle basis. Rhode Island [2021-H 5132A](#), [2021-S 0357A](#) which mandated the 50% biodiesel blending requirement makes no mention of lifecycle accounting, which is highly problematic because Rhode Island, like Maine, still utilizes an outdated GHG Inventory methodology that assumes all biofuels are completely carbon neutral. More recently, in the Rhode Island, [the Future of Gas Technical Report](#) summarized the controversy surrounding GHG accounting for biofuels in the state 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.” 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.”⁴

In other words, Rhode Island put the cart (biodiesel blending requirements) before the horse (well-defined lifecycle accounting guardrails), and, as a result, has a policy on the books with highly uncertain climate benefits. It is critical that Maine further evaluate the actual GHG emission reduction benefits, supply constraints, and anticipated costs of

⁴ Rhode Island Investigation into the Future of the Regulated Gas Distribution Business, Technical Analysis Report, page 26 <https://www.ethree.com/wp-content/uploads/2024/06/Docket-22-01-NG-E3-Technical-Analysis-Report.pdf>

alternative fuels before actively pursuing strategies to advance their deployment in any sector (power generation, transportation, building heating).

The ‘Core’ Pathway Highlights the Urgency of a Future of Gas Proceeding in Maine

Page 26 of the Draft Technical Report mentions that, in the Core pathway, “Pipeline natural gas demand decreases from about 19 trillion BTU in 2023, to 7 trillion BTU in 2040 and 2 trillion BTU in 2050.” In other words, the Core pathway envisions the volume of pipeline gas delivered to customers in Maine decreasing approximately 90% over the next ~25 years. On page 38-39, the Draft Technical Report goes on to describe the implications of this sharp decrease in pipeline gas demand:

“Total gas system costs decline only slightly over time as more customers adopt electric heating, reducing their gas usage or departing the gas system altogether. However, this means that gas delivery costs, which are largely fixed, will be spread over a declining customer base with falling total sales. This will likely lead to higher average unit costs and higher bills for remaining customers (gas ratemaking and thus customer bill impacts may change in response to these forces).”

In a footnote on page 69, the report goes on to state

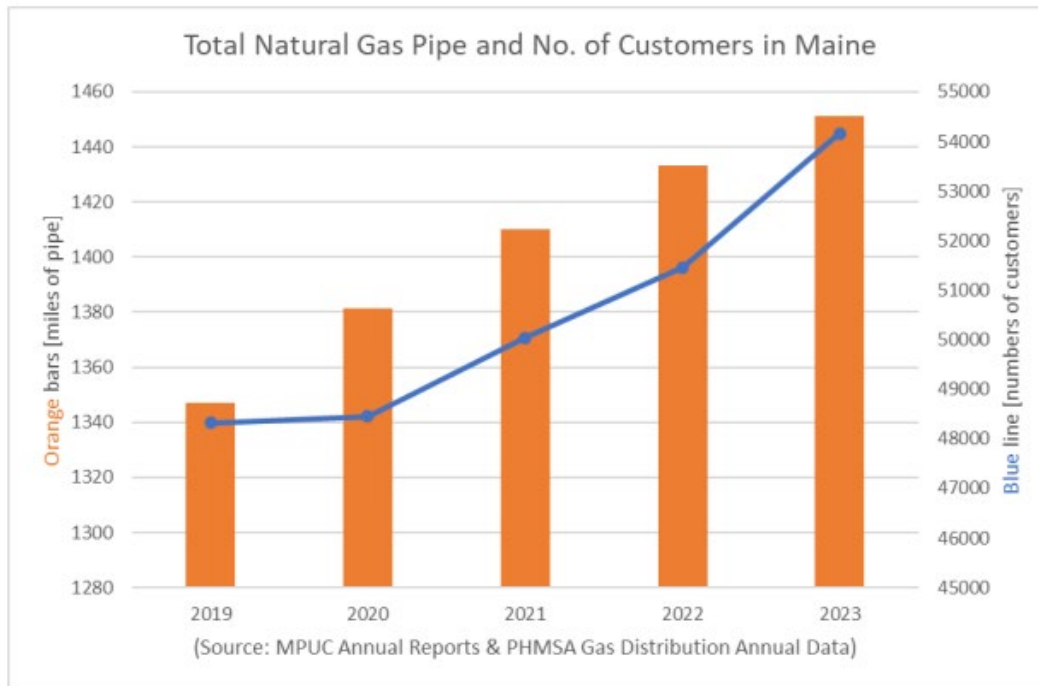
“Further, gas rates may increase, perhaps dramatically, as the largely fixed costs of the gas system are spread across fewer customers and lower gas volumes. This is less of a problem in Maine than in most other jurisdictions, at least in terms of numbers, because few residential customers in Maine rely on gas; most rely on fuel oil or other delivered fuels. Still, for affected customers, this may be an important issue as well.”

Although the Draft Technical Report does not go into any depth emphasizing the importance of this topic, the two excerpts above highlight why a “Future of Gas” proceeding in Maine will be critical to evaluating how the gas distribution system in Maine can be most effectively managed over the coming decades to 1) Comply with the states overarching GHG reduction targets 2) Minimize stranded costs on the system and 3) Minimize the high risk of skyrocketing gas rates negatively impacting residential customers (particularly disadvantaged customers) remaining on the gas system as other gas system customers depart the system. These reasons, among others, are why [at least twelve states](#) have ongoing regulatory cases exploring the future of natural gas. The Rhode Island Public Utilities Commission [FOG Proceeding Scope](#) document provides an excellent example of the full scope of essential questions that should be addressed in a FOG proceeding and the [Technical Analysis Report](#) generated as a result of that proceeding highlights the importance of pivoting away from “business as usual” gas system planning as quickly as possible to mitigate the negative impacts of the transition away from reliance on the gas distribution system.

Relative to other states in the region, given the lack of historic gas system expansion, Maine finds itself in an enviable place regarding the extent of gas system sprawl and the associated future risk of stranded gas system assets. However, this is not a static condition, as the state added 6,000 gas customers over the 2019-2023 time period (12% increase) and installed over 100 miles of new pipe

over the same time period (8% increase), as illustrated in Figure 2 below.⁵ The recent expansion of the gas system in Maine further highlights the urgency for the state to establish its own proceeding investigating the future of the gas system.

Figure 2. Maine Natural Gas System Expansion 2019-2023



The Draft Technical Report Highlights the Central Role of the Grid in Unlocking Maine’s Clean Energy Future

The Draft Technical Report highlights numerous areas that demonstrate how centrally important the grid will be for Maine’s energy pathways. This is true both for the transmission and distribution grids in Maine as well as for how these grids operate as part of a much larger functional grid across ISO-NE and even the Northeast Power Coordinating Council (NPCC). Acadia Center agrees strongly with the report’s stated need to situate Maine’s planning within the regional and interregional context and encourages further action in this regard: “Continued progress will require coordinating with neighboring states and regional entities.”

At a high level, Acadia Center agrees with the report about the importance of upgrading and expanding the capacity of the grid in Maine, including via cost-effective transmission and the use of grid enhancing technologies (GETs). The Draft Technical Report has several recommendations on both in-state and regional transmission development that align with Acadia Center’s own research and advocacy. Electrification and the growing demand for renewables will require that renewable energy be movable from where it is generated to where it is needed. There must be a growing emphasis on generation and transmission that will benefit Mainers, as well as others in the region. Acadia Center

⁵ Maine Office of the Public Advocate, “Natural Gas Expansion (2019-2023)”. Source data from MPUC Annual Reports & POHMSA Gas Distribution Annual Data. https://energynews.us/wp-content/uploads/2024/03/Nat-Gas-Expansion-Chart_2024-02-20-1.pdf

agrees with the Draft Technical Report's suggestion that Maine should focus on three transmission priorities in the regional transmission planning process ("LTTP") that is unfolding now, including: 1) the North/South interface near Surowiec; 2) upgrades to unbottle onshore wind and solar from northern Maine; and 3) upgrades to integrate several gigawatts of offshore wind in the Gulf of Maine. We encourage Maine to seek support for these three needs in the current and future LTTP solicitations as opportunities arise, making efforts to consider the cost synergies that the Report notes when considering all three collectively. We also recommend Maine's push for express consideration of and preference for transmission solutions that make use of grid-enhancing technologies (GETs) to address these and other needs. Finally, Acadia Center acknowledges the emphasis the Report places on load flexibility strategies to minimize future peak demand resulting from beneficial electrification, which will minimize the need for future transmission investments.

Other Topics for Consideration:

- **Removing obstacles to solar implementation in Maine.** Solar is a proven technology with decreasing costs that presently encounters unacceptable delays in interconnection. The state should continue programs like "Solar for All" that allow low-income Mainers to reap the benefits of solar power. Solar DERs should be implemented faster and less expensively by the utilities. Solar should not be a peripheral source, relegated to dealing with peaks, but should be central to Maine's energy future.
- **Greatly expanding battery storage.** Without widespread battery storage, there can be no meaningful adoption of wind, water, and solar renewables at scale. Maine has made real progress toward installing two substantial battery storage facilities, including one facility that will provide power for up to four days. Also, Mainers need help in purchasing batteries for rooftop solar, now.
- **Using technology to expand demand management.** Implement TOU, load shifting, and any other flexible system to avoid the necessity of costly system upgrades, as the Draft suggests.
- **Continuing advocacy and support for EV adoption in Maine.** The transportation sector accounts for 51% of Maine's greenhouse gas emissions. EVs can address this problem directly and are particularly promising for load shifting, as vehicle technology makes charging schedules for EVs readily adaptable. EV "ambassadors" should be tasked with reaching out to Mainers to help them adopt EVs, and to combat misinformation. Modern EVs are capable, fun, and far less expensive to operate. Because home charging provides 99% of most EV users' needs, the State should aid in purchasing and installing home chargers. "Fast" EV chargers should continue to be installed, with an emphasis on Northern and Western Maine.

Acadia Center applauds the efforts of the Consultants in assisting the GEO to meet both the promise and the challenges of charting Maine's energy future and again appreciates the opportunity to comment here.

Sincerely,

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