June 6, 2024

Commissioner Guhl-Sadovy
President, Board of Public Utilities
44 South Clinton Avenue
Trenton, New Jersey 08625

Re: In The Matter of the 2024 New Jersey Energy Master Plan; Docket No. QO24020126.

COMMENTS OF THE NEW JERSEY PROPANE GAS ASSOCIATION

On behalf of the New Jersey Propane Gas Association (NJPGA), which represents propane marketers, wholesales, suppliers, and equipment manufacturers across New Jersey, we appreciate the opportunity to provide comment to the New Jersey Board of Public Utilities (NJBPU) regarding the 2024 Energy Master Plan (EMP). Our members provide clean-burning and critical energy to residential, commercial, industrial, and agricultural customers in the state. New Jersey's propane industry provides good-paying jobs and generates more than $920 million in economic activity annually.[1]

As energy providers, propane marketers are directly affected by numerous components of the EMP that are currently under consideration. As such, NJPGA has a substantial interest in this docket and the subsequent policy proposals and that will result from it. Although the New Jersey Master Energy Plan encompasses many facets that impact energy providers, our comments will focus specifically on Strategy 4 – Reducing Energy Consumption and Emissions from the Building Sector. Strategy 4 is of great concern to propane marketers, as residential and commercial accounts represent 63 percent of all propane sold in the state. In fact, providing fuel for building applications provides the bedrock demand that many retailers rely on to keep their doors open and employees on the payroll.

Strategy 4: Reducing Energy Consumption and Emissions from the Building Sector

I. Building Electrification.

A core premise of Strategy 4 is that, by converting residential and commercial buildings from propane to grid electricity, we are reducing GHG emissions and helping the climate. However, electrification does not always translate to decarbonization, and it is important to understand why. Unlike propane, electricity is a secondary energy source – it must be created before it can be used for useful purpose.

Board staff needs to take a holistic view of energy consumption and evaluate the carbon footprint of all energy sources – and the appliances that are powered by them – fairly and accurately. This is best accomplished through a full fuel-cycle (FFC) analysis of energy consumption the utilizes source energy metrics. FFC includes the energy consumed onsite, but also incorporates the applicable energy used in upstream processes, as well as the energy needed to convert a primary energy source into a secondary one and transport that energy to an end user. The use of FFC and source energy metrics has been endorsed by the National Academies and the Department of Energy's Office of Energy Efficiency and Renewable Energy.[2] If the core objective of the EMP is to reduce aggregate GHG emissions – and not simply shift emissions from one sector (buildings) to another (power generation) – then efficiencies and associated emissions need to analyzed using metrics that provide an accurate representation of their net carbon contribution.

[1] Propane's Impact on Economy: 2021 New Jersey, National Propane Gas Association, (2024), https://www.npga.org/wp-content/uploads/2024/05/New-Jersey_2024.pdf

[2] *Energy Conservation Program for Consumer Products and Certain Commercial and Industrial Equipment: Statement of Policy for Adopting Full-Fuel-Cycle Analyses of Energy Conservation Standards Programs*, Federal Register, Volume 76, No. 160, (August 18, 2011), https://www.govinfo.gov/content/pkg/FR-2011-08-18/pdf/2011-21078.pdf

Propane has a source-site ratio of 1.01, compared to 2.80 for grid electricity.[3] This means, for electricity from the grid, it takes 2.80 units of energy to produce and delivery one unit of energy to a home, compared to only 1.01 for propane. Bulk electricity is very inefficient and a vast amount of energy is lost throughout the electric generation and delivery process. For utility-scale electricity, more than 60 percent of energy is lost during the generation and conversion process, thereby drastically increasing emissions of GHGs and criteria pollutants.[4] More so, an additional 5 percent of energy is lost during the transmission and distribution of electricity to an end user, further decreasing efficiencies and increasing emissions.[5]

Today fossil fuels, including coal and natural gas, still generate more 53 percent of utility-scale electricity in New Jersey.[6] The efficiency of a typical natural gas plant, however, is only 44 percent; the efficiency of a coal-fired power plant is a paltry 32 percent.[7] Collectively, the inefficiencies associated with utility-scale electricity mean that power companies must burn more fuel to generate sufficient electricity to meet demand. Given all of these inefficiencies, it should be no surprise then to learn that conventional propane has a lower carbon intensity score than an equivalent of electricity from the bulk grid. Propane has already helped reduce emissions from the built environment in the past, and it can do so into the future.

Finally, in regards the cost-effective component of building decarbonization plan, it should be noted that, per unit of energy, grid electricity is far more expensive than propane.[8] This cost dynamic is especially impactful in New Jersey because retail electricity rates – for both residential and commercial customers – are higher than national averages.[9] This hurts consumers and makes businesses less competitive.

Policy-driven electrification will undoubtedly impact retail electricity prices. Even with efficient electrical equipment, disallowing other energy sources to participate in market will drastically increase the aggregate electric load. Space and water heating are, by significant margins, the two most energy intensive applications in a typical U.S. home.[10] Electrifying a home that previously used a non-electric primary energy source, like propane, increases the grid's total electric load. Some states actually prohibit this type of electric fuel-switching because the resulting activity increases, not decreases, demand for electricity.[11] Utility electricity is the primary heating fuel in only 15 percent of New Jersey households.[12] Substantially increasing this figure, like this plan proposes, would necessitate additional upgrades and

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[3] *Source Energy Technical Reference,* Energy Star Portfolio Manager, U.S. Environmental Protection Agency, (August 2023), https://portfoliomanager.energystar.gov/pdf/reference/Source%20Energy.pdf

[4] *More than 60% of energy used for electricity generation is lost in conversion,* U.S. Energy Information Administration, (July 21, 2020), https://www.eia.gov/todayinenergy/detail.php?id=44436

[5] *How much electricity is lost in electricity transmission and distribution in the United States?*, U.S. Energy Information Administration, (November 7, 2023), https://www.eia.gov/tools/faqs/faq.php?id=105&t=3

[6] Electricity Data Browser: 2022 Annual New Jersey, U.S. Energy Information Administration, https://www.eia.gov/electricity/data/browser/#/topic/0?agg=2,0,1&fuel=vtvv&geo=0004&sec=008&linechart=ELEC.GEN.ALL-NJ-98.A&columnchart=ELEC.GEN.ALL-NJ-98.A&map=ELEC.GEN.ALL-NJ-98.A&freq=A&start=2022&end=2023&ctype=linechart&ltype=pin&rtype=s&maptype=0&rse=0&pin=

[7] Table 8.1. Average Operating Heat Rate for Selected Energy Sources, U.S. Energy Information Administration, https://www.eia.gov/electricity/annual/html/epa_08_01.html

[8] *Energy Conservation Program for Consumer Products: Representative Average Unit Costs of Energy*, Office of Energy Efficiency and Renewable Energy, U.S. Department of Energy, Vol. 88, No. 165, Federal Register, (August 28, 2023), https://www.govinfo.gov/content/pkg/FR-2023-08-28/pdf/2023-18532.pdf

[9] Table 2.10. Average Price of Electricity to Ultimate Customers by End-Use Sector, U.S. Energy Information Administration, https://www.eia.gov/electricity/annual/html/epa_02_10.html

[10] *Space heating and water hearting account for nearly two thirds of U.S. home energy use*, U.S. Energy Information Administration, (November 7, 2018), https://www.eia.gov/todayinenergy/detail.php?id=37433

[11] *State Policies and Rules to Enable Beneficial Electrification in Buildings through Fuel Switching*, American Council for an Energy-Efficient Economy (ACEEE), (April 2020), https://www.aceee.org/sites/default/files/pdfs/fuel_switching_policy_brief_4-29-20.pdf

[12] House Heating Fuel 2022 New Jersey: ACS 5-Year Estimates Detailed Tables, American Community Survey, U.S. Census Bureau, (2022), https://data.census.gov/table/ACSDP5Y2022.DP04?g=040XX00US34

investments across the electric sector so it could cope with a larger and more dynamic load. These investments would almost certainly put upward pressure on already high electric rates.

These are the real-world factors that need to be properly assessed before state officials continue to endorse a state energy plan that is largely focused on the construction of all-electric buildings, and pushing consumers away from propane to grid electricity to power core building functions.

II. Hybrid Heating Systems

While air source heat pumps are, at the site level, efficient – although the broader electric grid is anything but – they start to lose efficiency around 32 degrees Fahrenheit and, as such, building owners typically rely on supplemental heating systems to provide adequate warmth.[13] This is especially true in a state like ours that has a cold climate and a long winter heating season. If the ultimate goal is to decarbonize buildings in a cost-effective manner, then Strategy 4 should endorse the installation of hybrid heating systems, and ensure that traditional electric resistance heating, which is extremely inefficient, is not the default secondary heating source.

Propane heating equipment can aide heat pumps – both air- and ground-source – when temperatures drop and their efficiency declines. This ensure buildings are kept at optimal temperatures and personal comfort is not sacrificed. Notably, hybrid systems can be configured in different ways to meet the unique energy needs of a structure, and the personal preferences of consumers. For example, a propane furnace or boiler can simply be relied upon on when temperatures fall and heat pumps struggle to perform. These dual-fuel systems are extremely efficient and climate-friendly. Furthermore, the propane industry has made investments in hydronic heating technology (using water for space heating purposes) whereby a propane-powered tankless water heater is used to create hot water that is then transmitted over a series of hydronic coils that are then used to create hot air. This air is then circulated through a building's existing ductwork. These systems work in tandem with electric heat pumps and are superior choice to electric resistance heating.

In short, whether the focus is new construction or renovating existing properties, financial incentives for heat pump installations should be not made available to building owners who utilize electric resistance heating as the backup thermal source. State officials should not reward the continued use of inefficient and carbon-intensive resistance heating. Rather, they should focus on innovative and climate-friendly solutions that do not further burden our aging electric grid.

III. Renewable Propane

Beyond conventional propane, our industry is also actively promoting the use of renewable propane as another means to reduce GHG emissions. Renewable propane is a by-product of renewable diesel and sustainable aviation fuel production. It can be produced from many sustainable sources, including fats, oils, greases, forest resources, wastes, and agricultural residue.[14] In addition to retaining all of the same environmentally-friendly attributes as traditional propane, it has an even lower carbon intensity.[15] Carbon intensity should be the preferred metric by which state officials determine the climate impact of any energy source. In California, for example, renewable propane being in the marketplace has a carbon

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[13] Glossary, Heat pump (air source), U.S. Energy Information Administration, https://www.eia.gov/tools/glossary/index.php?id=H

[14] Baldwin, R., Nimlos, M., and Zhang, Y., *Techno-Economic, Feasibility, and Life Cycle Analysis of Renewable Propane*, National Renewable Energy Laboratory, U.S. Department of Energy, (October 2022), https://www.nrel.gov/docs/fy23osti/83755.pdf

[15] *Staff Summary, Renewable Naphtha and Renewable Propane from Distillers' Corn Oil, Used Cooking Oil, and Rendered Animal Fat*, California Air Resources Board (April 30, 2021), https://ww2.arb.ca.gov/sites/default/files/classic/fuels/lcfs/fuelpathways/comments/tier2/b0189_summary.pdf

intensity score as low as 20.5, far less than other energy sources, including electricity.[16] In fact, renewable propane has a carbon intensity score that is approximately 4x lower than grid electricity in the Garden State.

Renewable propane can be used on its own or seamlessly blended in with conventional stocks, as it is chemically identical to the traditional molecule.[17] Renewable propane can be used in all conventional combustion applications without modifying or replacing equipment. It is already being produced at commercial scale in the U.S., including by producers who secure renewable identification numbers (RINs) credits for compliance under the federal Renewable Fuel Standard.[18] Today, renewable propane is being consumed in California and Oregon, supporting decarbonization efforts in these states.

However, if New Jersey proceeds with an electric-only mindset, it runs the risk of creating a marketplace in which the delivery of renewable propane will be penalized. This is antithetically to the underlying tenets of the original EMP and subsequent review process. The use of renewable propane in building applications – everything from space heating to cooking – should be incentivized and rewarded under any logical programmatic structure.

IV. Conclusion.

Sustainable and cost-effective decarbonization is best achieved through a multi-pronged approach that includes clean and efficient energy molecules, such as propane, in addition to bulk electricity generated from more carbon-friendly sources. Such an approach would take into full consideration the carbon intensity of various forms of energy, the reliability and resilience of the energy sector, as well as the aggregate costs passed along to consumers and businesses. These items should be reflected in the 2024 EMP update.

Thank you again for the opportunity to provide comment.

Respectfully submitted,

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[16] *Id*.
[17] Renewable Propane, Alternative Fuels Data Center, Office of Energy Efficiency and Renewable Energy, U.S. Department of Energy, https://afdc.energy.gov/fuels/propane-renewable
[18] Approved Pathways for Renewable Fuel, Renewable Fuel Standard Program, U.S. Environmental Protection Agency, (May 23, 2024), https://www.epa.gov/renewable-fuel-standard-program/approved-pathways-renewable-fuel