American Petroleum Institute
Northeast Region

April 18, 2025

Sherri L. Golden
Secretary of the Board
Board of Public Utilities
44 South Clinton Avenue, 1st Floor
P.O. Box 350
Trenton, New Jersey 08625-0350

Docket Number QO24020126
IN RE: In the Matter of the 2024 New Jersey Energy Master Plan

Submitted by U.S. Mail and electronically at: https://publicaccess.bpu.state.nj.us/CaseSummary.aspx?case_id=2112714

Dear Secretary Golden:

The American Petroleum Institute ("API")[1] appreciates this opportunity to provide comments to the New Jersey Board of Public Utilities ("BPU") on the 2024 update to the state's Energy Master Plan ("2024 EMP"). Released in January 2020, the 2019 EMP accounts for the state's complete energy system, including electricity generation, transportation, and usage in commercial buildings while incorporating legislative mandates "to reduce greenhouse gas emissions 80% by 2050, relative to 2006 levels." The 2024 EMP will report on those goals and "provide an overview of the state's progress toward achieving 100% clean energy by 2035."

API's members contribute significantly to New Jersey's economy.[2] Even though it is the fourth-smallest state by land area, New Jersey plays a major role in the supply of energy to the entire northeastern United States. Shipping terminals on the Delaware River on the state's western boundary and at the border with New York Harbor have extensive pipelines, rail, and storage terminals that make the state a hub for the distribution of fuels throughout the

[1] API represents all segments of America's natural gas and oil industry, which supports more than eleven million U.S. jobs and is backed by a growing grassroots movement of millions of Americans. Our 600 members produce, process and distribute the majority of the nation's energy, and participate in "API Energy Excellence," which is accelerating environmental and safety progress by fostering new technologies and transparent reporting. API was formed in 1919 as a standards-setting organization and has developed more than 700 standards to enhance operational and environmental safety, efficiency, and sustainability.

[2] The natural gas and oil industry, including petrochemical and plastics, supported almost 251,000 jobs, or 3.9 percent of New Jersey's total employment in 2021. The industry provided more than $18.6 billion in wages and contributed over $38 billion to the state economy. The United States has reduced carbon dioxide emissions to generational lows since 2000, leading the world in emissions reductions, thanks in large part to greater use of natural gas in electricity generation and advancements in technology and innovation. Many of these emission reductions are a result of natural gas replacing coal-fired power plants. *See* https://www.api.org/-/media/files/policy/american-energy/pwc/2023/api-pwc-economic-impact-report-2023 and https://www.api.org/news-policy-and-issues/american-energy/energy-builds-america-jobs-economy-environment-all-50-states.

northeast.[3,4,5,6] New Jersey does not have any crude oil production, but the state has three operating oil refineries.[7,8] The three refineries in New Jersey have a combined capacity of about 451,000 barrels per calendar day and produce a wide range of refined petroleum products.[9,10,11,12]

In addition to getting crude oil shipments by rail, New Jersey's refineries receive crude oil imports and petroleum products by tanker from all over the world.[13] The Linden Terminal is one of the ten largest petroleum terminals in the nation, with a storage capacity of 4.3 million barrels.[14] Several major petroleum product pipelines also cross the state.[15] The Colonial Pipeline, the nation's largest refined product pipeline, has its northern terminus in Linden; supplying petroleum products from Gulf Coast refineries to the New York and New England markets.[16] Other pipeline systems distribute refined petroleum products from New Jersey terminals and refineries to upstate New York and Pennsylvania.[17,18]

API believes that the best way to empower New Jerseyans is to implement energy policies that are measured and prioritize efficiency, reliability, and affordability. API and our member companies are committed to working with regulators and policymakers to deliver solutions that reduce carbon emissions while meeting society's growing energy demands. API believes that prudent energy and environmental policy recognizes that many different forms of energy will be needed for decades to come.[19] Efficient, affordable, and reliable energy is essential to sustaining the global economy and the wellbeing of all. [20]

API is pleased to see that the 2024 EMP is intended to "better capture economic costs and benefits, as well as ratepayer impacts."[21] API believes that **factoring in costs and ratepayer impacts, as well as avoiding mandates and fostering consumer choice, are the foundations of prudent energy policy**. The comments respectfully submitted below underscore the importance of a balanced policy that incorporates and values the energy produced by the natural gas and oil industry.

The comments that follow are specific to the electricity, buildings, and transportation sectors.

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[3] U.S. Census Bureau, State Area Measurements and Internal Point Coordinates, updated December 16, 2021.
[4] South Jersey Port Corporation, Facilities, accessed December 4, 2024.
[5] Port Authority NY NJ, Publications, 2023 Port At A Glance, accessed December 2, 2024.
[6] U.S. Energy Information Administration (EIA), Interactive GIS Data Viewer, Layer List: State Mask New Jersey, accessed December 2, 2024.
[7] U.S. EIA, Crude Oil Proved Reserves, Reserves Changes, and Production, Proved Reserves as of 12/31 and Estimated Production, 2016-21.
[8] U.S. EIA, Refinery Capacity Report (June 2024), Table 3, Capacity Operable Petroleum Refineries by State (January 1, 2024).
[9] U.S. EIA, "Refinery capacity increased slightly for the first time since the COVID-19 pandemic," Today in Energy (July 25, 2023).
[10] PBF Energy Inc., Refineries, accessed November 29, 2024.
[11] U.S. EIA, Number and Capacity of Petroleum Refineries, Total Number of Operable Refineries, and Atmospheric Crude Oil Distillation Operable Capacity, Annual as of January 1, 2018-23.
[12] Phillips 66 Company, Bayway Refinery, Products, accessed November 29, 2024.
[13] U.S. EIA, Petroleum & Other Liquids, Company Level Imports, Port State, New Jersey, from XLSX, September 2024.
[14] Ahmed, Zahra, "12 Major U.S. Oil Terminals," Marine Insight (January 17, 2024).
[15] U.S. EIA, Interactive GIS Data Viewer, Layer List: State Mask New Jersey, Crude Oil Pipelines, Petroleum Products Pipelines, December 2024.
[16] Colonial Pipeline Company, System Map, and About Us, accessed December 4, 2024.
[17] Buckeye Partners, L.P., Buckeye Pipeline System New Jersy-New York-Pennsylvania, accessed November 25, 2024.
[18] *Ibid*.
[19] *See* https://www.eia.gov/todayinenergy/detail.php?id=51558.
[20] The United States has reduced carbon dioxide emissions to generational lows since 2000, leading the world in emissions reductions, thanks in large part to greater use of natural gas in electricity generation and advancements in technology and innovation. Many of these emission reductions are a result of natural gas replacing coal-fired power plants.
[21] Governor Murphy Press Release, *see* https://www.nj.gov/governor/news/news/562023/approved/20230120a.shtml.

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OVERVIEW

A Measured Approach
Consistent with the goal of empowering every New Jerseyan, API believes that a measured approach is one in which all voices and perspectives are heard; resulting in policies that allow stakeholders to compete on a level playing field to meet the state's vast energy needs while achieving its ambitious environmental goals. As the state considers various energy and climate priorities, it must do so with the goal of enriching New Jerseyans' lives through policies which are both effective and not overly burdensome to the taxpayer and consumer.

As discussed in detail below, API cautions the state to avoid policies that eliminate natural gas use in new building construction and retrofits, require mandatory electrification, and ban the sale of internal combustion engine vehicles. These changes could negatively impact the reliability of the power system, will remove consumer choice, and may result in increased consumer costs and an overreliance on an aging electric grid. Additionally, these policies may fail to adequately reduce carbon emissions.

Natural Gas Has Provided Carbon Emission Reduction Benefits
Decarbonization efforts should be undertaken in a technology-neutral manner that incentivizes emission reductions rather than favoring specific energy sources. Natural gas has a proven track record of facilitating carbon dioxide ("CO_2") emissions reductions in many sectors of the economy. Over the past two decades, the state has seen a steady decline in the carbon intensity of its energy supply because of the utilization of natural gas across the residential, commercial, electricity, and industrial sectors. Between 1997 and 2022, the state's carbon intensity fell by approximately 52 percent.[22] At the same time, natural gas is essential for home heating in New Jersey, as seven out of ten New Jersey households use it as their primary fuel to heat their home.[23]

API believes that consumers should retain the ability to choose how to fuel their homes and businesses, particularly considering the CO_2 emission reductions that have been achieved in recent years have been greatly facilitated by natural gas usage. Available and reliable energy sources – such as natural gas – can help reduce CO_2 emissions while allowing for growth.

Moreover, PJM Interconnection ("PJM"), the non-profit entity that operates the state's power grid, recently received approval from the Federal Energy Regulatory Commission ("FERC") to give new resources that help system reliability – including natural gas power plants – priority in connecting to the grid based on an urgent need to satisfy increased demand for electricity.[24]

The Perils of Bad Energy Policy
The experience of California provides insight as to how bad energy policy can negatively impact consumers in terms of reliability and cost. The state enacted an aggressive renewable portfolio standard that prioritized the development of certain types of resources rather than the reduction of carbon emissions. Additionally, state regulators effectively halted the development of new gas-fired plants and directed utilities to close some coastal gas-fired power plants. These

[22] Note 1997 through 2022 are the most recent year for which emissions data is available from the U.S. Energy Information Administration, *see* https://www.eia.gov/environment/emissions/state/. EIA Energy-related CO_2 Emission Data Table 7.
[23] *See* U.S. Energy Information Administration - EIA - Independent Statistics and Analysis.
[24] *See* https://elibrary.ferc.gov/eLibrary/filelist?accession_number=20250211-3120&optimized=false.

actions contributed to declining grid reliability as utilities were left with insufficient ramping capabilities needed to balance intermittent generation. This culminated in a load-shedding event in August 2020 that left hundreds of thousands of Californians without electricity in the middle of a heat wave.

In response to reliability challenges, California purchased four gas-fired generators at a cost of nearly $200 million. The type of generators purchased – aeroderivative gas turbines – tend to have higher carbon emission rates relative to combined cycle gas-fired plants.[25] In addition to reliability issues, these policies have also contributed to California's surging retail electricity prices,[26] which were among highest in the country in 2021[27] and trailed only Hawaii in 2023.[28]

The events and experiences in California underscore the importance of sound energy policy and highlight the benefits of a technology-neutral approach when addressing climate change. Accordingly, New Jersey policymakers should be hesitant and judicious in any decision – including the denial of permit renewals – that could result in the premature retirement of gas-fired power plants needed for reliability. The premature retirement of power plants could also have an adverse impact on the regional capacity market with additional costs assumed by electricity ratepayers within the Garden State and throughout the regional transmission organization's footprint.

Plan Must Consider Impact on Affordability

Many state-level clean energy policies seek to replace heating derived from oil, natural gas, and propane with electric heat. But the practical reality of doing so is that residential and commercial consumers may be left with only one option: to use only electric heat pumps for heating and service needs.[29]

Recent Energy Information Administration ("EIA") projections indicate – even with the integration of vast amounts of renewables – natural gas will remain an important and necessary fuel for decades to come. Additionally, state and federal policies may put upward pressure on the demand for electricity, which can ultimately increase the demand for natural gas generation.

Natural gas will likely continue to be the marginal fuel for years to come in PJM even as large quantities of renewable resources are added to the grid. Accordingly, the electricity used to meet the state's needs will frequently come from natural gas-fired generators. EIA recently noted that "renewables will be the primary source for new electricity, but natural gas … [and] batteries will be used to help meet load and support grid reliability."[30]

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[25] *See* https://www.ge.com/gas-power/products/gas-turbines/lm6000. Based on an assumed natural gas carbon intensity of 117 lbs./million BTU.
[26] *See* https://www.utilitydive.com/news/californias-dilemma-how-to-control-skyrocketing-electric-rates-while-buil/597767/
[27] EIA Average Retail Price of Electricity to Ultimate Customers, available at: https://www.eia.gov/electricity/data.php#sales.
[28] EIA retail rate comparison by state (and by year) available at https://www.eia.gov/electricity/state/.
[29] It is worth noting that having only one option is an oxymoron and is better characterized as a mandate and a lack of consumer choice.
[30] See https://www.eia.gov/todayinenergy/detail.php?id=49856. Renewable capacity in generator interconnection queues has grown year over year. As of 2021, the queues included over 755 gigawatts (GW) of generation capacity. Solar and wind comprised the vast majority at 680 GW; furthermore, an estimated 200 GW of electric storage capacity was in queues, a common complement to renewable projects. The amount already in queues may represent 70 percent of the projected capacity to meet the Biden administration's clean energy target of 80 percent emissions-free power generation by 2030. However, the completion rate for projects languishing in interconnection queues has been abysmal. Even for those projects that ultimately achieve commercial operation, average wait times while in the queues has nearly doubled over the past decade. Renewables-associated transmission proposals fared worse than conventional projects, with a 19 percent completion rate for wind and 16 percent for solar, respectively, compared to 24 percent overall. See "2030: The Report," Goldman School of Public Policy at the University of California Berkeley. April 2021. Available at: https://gspp.berkeley.edu/faculty-and-impact/centers/cepp/projects/2030-report-powering-americas-clean-economy and "Queued Up: Characteristics of Power Plants Seeking Transmission Interconnection," Lawrence Berkeley National Laboratory. May 2021. Available at: https://eta-publications.lbl.gov/sites/default/files/queued_up_may_2021.pdf.

Development of effective and equitable public policy requires that all relevant information be part of the discussion. Widespread heating electrification has significant reliability and capacity need implications that are largely absent from the many deep decarbonization studies conducted to date.[31] Additionally, increased electricity loads resulting from electrification, without corresponding investments in the electric grid, could compromise the reliability of the system. Electrification policies will likely require distribution system upgrades and, in the long run, transmission system upgrades that can be controversial and challenging to site.[32]

Unfortunately, frequently minimized in policy discussions is the issue of cost to the consumer. Cost is an important consideration as it directly and immediately impacts consumers, while potentially disproportionately affecting lower-income households and communities. Equipment installation costs also vary by building sector and geographic region. Carbon reduction strategies would be wise to evaluate these impacts and offer solutions that minimize economic disruption while maximizing the benefits.

BUILDING SECTOR CONSIDERATIONS

As described in detail below – extensive data sets in the northeast, including Maryland, Massachusetts and New York – suggest that the installation of air-source heat pump systems at the residential level is costly, particularly for most low- and middle-income households. The 2024 EMP should clearly identify the potential cost implications associated with current and potential electrification policies. This updated and specific information can be informative in guiding future policies.

Costs to Consumers

The 2024 EMP should recognize and consider the added cost associated with heat pumps in both new and existing construction. According to research conducted for the National Association of Home Builders, all-electric homes can cost more upfront in comparison to homes equipped with natural gas.[33] Specifically, the overall range of estimated electrification costs for an electric reference house compared to a baseline gas reference house in cold-weather climates is between $11,000 and $15,000.[34] The higher costs in colder, heating-dominated climates are due to the need for more expensive heat pumps rated to operate in colder temperatures. The more expensive electric equipment can also result in higher energy costs by $84 to $404 annually compared to a baseline gas-equipped house, and by $238 to $650 annually compared to a house with high efficiency gas equipment.

Consumers in colder climates will therefore likely be faced with higher upfront construction costs and higher operating costs throughout the life of the equipment.[35] With respect to appliances, electric stoves are estimated to cost anywhere

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[31] Jenkins, J.D., Luke, M., and Thernstrom, S. (2018). "Getting to zero carbon emissions in the electric power sector" 2498–2510.
[32] *See* Hopkins AS, Horowitz A, Knight P, Takahashi K, Comings T, Kreycik P, *et al*. "Northeastern Regional Assessment of Strategic Electrification: Northeast Energy Efficiency Partnerships," June 29, 2017.
[33] *See* https://www.nahb.org/-/media/NAHB/nahb-community/docs/committees/construction-codes-and-standards-committee/home-innovation-electrification-report-2021.pdf.
[34] The study included the cold weather climates of Denver and Minneapolis.
[35] *Ibid*. Climate zone had a strong influence on both construction costs and energy use costs. In colder climates, heat pumps with variable refrigerant flow rated for operation during low outdoor temperatures are needed. Often referred to as cold climate heat pumps, these systems are *typically* more expensive: $8,000-$9,000 more compared to a gas furnace. (*Emphasis added*).

from ten to thirty percent more than those powered by natural gas.[36]

Electrification costs in Massachusetts – with a climate similar to New Jersey – serves as a reasonable point of reference. *Diversified Energy Specialists,* a renewable energy consulting and environmental markets trading company, has completed case studies on residential air-source heat pump rebate programs in the state and concluded that electrification costs in Massachusetts would likely be comparable to those included in the National Association of Home-Builders analysis. [37]

The Massachusetts Clean Energy Center ("CEC") launched a "Whole-Home Air-Source Heat Pump Pilot Program"(CEC Pilot Program) in May 2019.[38] For 24 *new construction projects* the average conditioned square footage of home was 1,694 sq. ft., and the average heat pump project cost was $14,349.[39] Replacing and upgrading a natural gas, propane, or heating oil system at the end-of-life in the northeast typically costs a homeowner between $7,000 and $10,000.[40] According to National Association of Home Builders' 2021 Priced-Out Estimates, every $1,000 increase in a median new home price would disqualify 153,967 American households from obtaining a new home mortgage.[41]

A 2022 New York report makes comparable conclusions. The report, *New York Building Electrification and Decarbonization Costs* ("NY REALTORS Report"), commissioned by the New York State Association of REALTORS, "estimates that overall costs to retrofit a typical, existing gas-powered single-family home in New York ranges from $17,400 to $31,700, including an air source heat pump, water heater, cooktop range, clothes dryer and electrical modifications. Overall costs to retrofit with a ground source heat pump in New York would be significantly more expensive, ranging from $28,400 to $50,500, including the full set of additional appliances."[42]

Furthermore, electrification is presently most viable in new construction located in milder climates, where a single electric heat pump can be used instead of separate heating and cooling units, and especially where local gas infrastructure installation costs can be avoided.[43] But requiring existing buildings to retrofit is entirely another matter. The costs are often exceptionally high, potentially in the tens of thousands of dollars per unit.[44] Beyond more obvious capital and operating cost considerations, converting existing direct fuel equipment to electric may also require a costly upgrade to a building's electricity service feed to power new equipment.[45]

In addition to new construction, the CEC Pilot Program involved 53 *existing building projects* for homes displacing

[36] *See* https://www.blvdhome.com/blog/electric-vs-gas-stoves.
[37] *See* https://www.smartheatnj.com/wp-content/uploads/2021/09/Cost-of-Residendial-Air-Source-Heat-Pumps-Uglietto.pdf.
[38] *See* https://files-cdn.masscec.com/Program%20Summary%20%E2%80%93%20Whole-Home%20ASHP%20Pilot%20%2002172021.pdf.
[39] *See* https://www.masscec.com/blog/2020/09/29/september-whole-home-heat-pump-pilot-update-still-time-apply.
[40] *See* https://www.smartheatnj.com/wp-content/uploads/2021/09/Cost-of-Residendial-Air-Source-Heat-Pumps-Uglietto.pdf.
[41] *See* https://www.nahb.org/-/media/NAHB/news-and-economics/docs/housing-economics-plus/special-studies/2021/special-study-nahb-priced-out-estimates-for-2021-february-2021.pdf
[42] *See* https://nyelectrificationfacts.com/wp-content/uploads/2022/12/NY-Building-Electrification-Cost_Full-Report_6.22.2022.pdf.
[43] Deason, J., Borgeson, "M. Electrification of Buildings: Potential, Challenges, and Outlook", Current Sustainable Renewable Energy Rep 6, 131–139 (2019). *See* https://doi.org/10.1007/s40518-019-00143-2.
[44] *See* 20 No. 3 New York Zoning Law and Practice Report NL 1. Also, Representative Alexandria Ocasio-Cortez filed legislation to appropriate $172 billion over 10 years for energy efficiency upgrades and building electrification retrofits to 950,000 public housing units*. See* Senator Sanders and Representative Ocasio-Cortez bill which would fund public housing efficiency retrofits, 2021 WL 1523875.
[45] For example, one study notes that to accommodate electric space heating in California, there is an estimated cost of $4,700 to upgrade the electricity service for an existing single-family building and $35,000 for a low-rise multifamily building. See "Palo Alto Electrification Study, TRC Energy Services," November 16, 2016. *See* https://www.cityofpaloalto.org/files/assets/public/development-services/advisory-groups/electrification-task-force/palo-alto-electrification-study-11162016.pdf.

natural gas. The average conditioned square footage was approximately 1,600 sq. ft., and the average project cost approached $21,500. As discussed earlier, that cost stands in stark comparison (double to nearly triple in price) to replacing and upgrading a natural gas, propane, or heating oil system.[46] Similarly, the National Association of Home Builders concluded that the retrofit cost of electrification for an existing baseline gas house ranges between $24,000 and $28,500, while the retrofit cost of gas equipment and appliances for an existing baseline gas house is approximately $10,000 using standard efficiency equipment, and $13,000 using high efficiency gas equipment.[47]

Similarly, in April 2021, San Francisco's Board of Supervisors determined that requiring electrical retrofits of city residences (furnaces, water heaters, ovens and cooktops, and laundry appliances) would likely result in substantial costs to homeowners from disposal of old appliances, purchase of new appliances, labor, and electrical panel upgrades.[48] Estimated costs of retrofitting ranged from $14,000 per housing unit to nearly $20,000 for multi-family units and approximately $35,000 for single family homes. Applying these cost estimates to an estimated 240,231 housing units (76,470 single-family homes and 163,761 multi-family homes), the citywide cost to retrofit all residential units currently using natural gas-fueled appliances with those fueled by electricity ranges from $3.5 billion to nearly $6 billion.[49]

Consider that in April 2019 the New York City Council adopted Local Law 97, requiring existing buildings over 25,000 square feet to reduce their greenhouse gas (GHG) emissions by 40 percent by 2030 and 80 percent by 2050. Many of these buildings use natural gas-fired boilers to provide heat and hot water. Approximately 75 percent of covered buildings do not comply with the 2030 emissions limits, resulting in nearly 37,500 buildings required to undertake some level of retrofit before the end of the decade, including replacing any natural gas-fired boilers with electric boilers. These costs alone are estimated to reach $21 to $24 billion.[50]

The NY REALTORS' Report also "analyzed cost ranges for small, low-rise apartment buildings (small multifamily) with two to 19 units and large, mid- to high-rise apartment buildings (large multifamily) with more than 20 units, including a full set of electrical appliances. For small multifamily buildings, the overall costs to retrofit with an air or water source heat pump range from $13,000 to $30,000 per unit. Retrofit costs with a ground source heat pump range from almost $30,000 to $43,000 per unit. For large multifamily buildings, generally most relevant for apartment and condominium buildings in Downstate New York, overall costs to retrofit range from $19,400 to $43,000 per unit with an air or water source heat pump, and from $41,000 to $56,000 per unit with a ground source heat pump."[51]

Lastly, research conducted for the Massachusetts Home Builders[52] indicates that the specialized stretch energy code allowing zero-emissions construction is likely to increase the cost of building single-family homes and townhouses by roughly 1.8 to 3.8 percent (which means an average single-family home construction could be impacted by over

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[46] *See* https://www.smartheatnj.com/wp-content/uploads/2021/09/Cost-of-Residendial-Air-Source-Heat-Pumps-Uglietto.pdf.

[47] *See* https://www.nahb.org/-/media/NAHB/nahb-community/docs/committees/construction-codes-and-standards-committee/home-innovation-electrification-report-2021.pdf, at note 8.

[48] Many factors impact potential construction costs. For instance, some buildings would require sidewalk transformers to be installed to handle the increased electrification demanded. And most homes in San Francisco would require electric panel conversions to support electric appliances.

[49] *See*: https://sfbos.org/sites/default/files/BLA.ResidentialDecarbonization.042221.pdf.

[50] *See* "Big Questions (and Some Answers) About the Climate Mobilization Act" (PowerPoint), April 23, 2020, NYCBAR 44, and "Retrofit Now! Reducing Carbon and Complying with LL97," CUNY Building Performance Lab.

[51] *See* https://nyelectrificationfacts.com/wp-content/uploads/2022/12/NY-Building-Electrification-Cost_Full-Report_6.22.2022.pdf.

[52] "Public Policy for Net Zero Homes and Affordability", Wentworth Institute of Technology, Massachusetts Institute of Technology, and Home Builders & Remodelers Association of Massachusetts (2023). *See* https://hbrama.com/wp-content/uploads/2023/05/Public-Policy-for-Net-Zero-Homes-and-Affordability-Final-6-14-23.pdf.

$25,000.[53] The report suggests the increase in cost of new all-electric construction of large multi-family buildings would be roughly 2.4 percent. The economic modeling demonstrates that these increases in construction costs could push the median single-family home in Massachusetts out of reach for between 15,000 and 33,000 households, all before accounting for any public financial incentives for green buildings.

Some of the increased construction costs could impact homebuyers and renters, while other costs could be absorbed by builders in the form of reduced profit margins. Increases in construction costs, however, are likely to reduce development, as fewer projects make economic sense and fewer households can afford new homes, putting further pressure on housing supply and affordability. The authors determined that the increased costs will likely be felt most by households with low and moderate incomes.[54]

Generation Fleet Impacts

With respect to electric generation, a rapid shift away from dispatchable generating resources that have firm fuel can result in higher electricity costs for customers.[55] Several of the considerations for policy implementation for the electricity sector include a strengthened Regional Greenhouse Gas Initiative target of zero GHG emissions by 2040 and a clean electricity standard ("CES") requiring 100 percent of in-state electricity to be produced from clean sources by 2035. These considerations ignore the benefits of maintaining flexible gas-fired power plants to help balance intermittent renewables and avoid shortages that could put upward pressure on electricity costs. Many utilities with aggressive decarbonization targets across the country have found that retaining natural gas in their system can help manage costs, and facilitate environmental benefits while providing system reliability.

Southern California Edison, the second largest utility in the country, wrote in its decarbonization roadmap that "some natural gas continues to be deployed because removing it completely … the 2045 electricity landscape would significantly increase resource costs." The roadmap, which is called "*Pathway 2045*," describes how the utility will achieve carbon neutrality by 2045 as required under state law. It also notes that it plans to keep 10,000 MW of gas-fired capacity available, because without it, "average annual resource costs would rise nearly 40% post-2030."[56]

The retirement of all fossil fuel-fired generators also ignores the fact that many – especially those fueled by natural gas – can be transitioned to lower-emitting fuels like lower-carbon hydrogen or renewable natural gas. These plants can also be retrofitted with carbon capture and sequestration technology as it becomes commercially available. These alternatives will help provide PJM a more complete portfolio of flexible resources which will provide greater reliability while managing the costs of decarbonization.

Policies Will Have a Significant Impact on Reliability

New Jerseyans need affordable and reliable energy. On cold nights, it is essential that everyone has access to affordable and reliable home heating. Given that most building emissions are related to space heating, reducing emissions from the

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[53] "It costs anywhere from $250,000 to $650,000 to build a custom home in Massachusetts. And that's just for construction!" *See* https://www.houzeo.com/blog/how-much-does-it-cost-to-build-a-house-massachusetts/.

[54] "Public Policy for Net Zero Homes and Affordability." (*See supra*).

[55] As EIA notes "electricity prices vary by locality based on the availability of power plants and fuels, local fuel costs, and pricing regulations." Shifting away from dispatchable power plants can require the use and importation of higher priced electricity. *See* https://www.eia.gov/energyexplained/electricity/prices-and-factors-affecting-prices.php#:~:text=Prices%20are%20usually%20highest%20in%20the%20summer%20when%20total%20demand,to%20meet%20the%20increased%20demand.&text=The%20cost%20to%20supply%20electricity%20varies%20minute%20by%20minute.

[56] Southern California Edison, Pathway 2045, at p. 8, November 2019, *see* www.edison.com/home/our-perspective/pathway-2045.html.

state's buildings sector through the adoption of zero emission building codes and standards would likely require a significant increase in the use of heat pumps in the residential and commercial sectors.

Broad adoption of heat pumps in New Jersey could add significant electricity demand to the grid while state policies seek to transition from firm, dispatchable resources to those that are intermittent and non-dispatchable. Building electrification efforts, coupled with electric vehicle transportation policies, collectively have the potential to change electricity consumption patterns and can put upward pressure on the wholesale clearing price of electricity, which in turn could increase retail electricity costs paid by consumers.[57]

Solar resources have made up a considerable amount of new capacity added in the state. This development means that solar generation, which is greatest during the day and non-existent at night, may be unavailable to meet load as the system peaks. While battery storage remains a promising potential solution to the challenge of integrating intermittent resources, it is currently unavailable in the quantities and durations required to maintain reliability on a system that is almost completely reliant on intermittent renewables. Without solar generation to meet demand during these periods, PJM will need to ensure that it has not only enough generation available, but that the available generation can ramp up quickly to meet heating load that increases sharply as temperatures fall in the evening.

Natural gas generation is uniquely capable of meeting that challenge, though it could eventually be complemented by emerging technologies including hydrogen and renewable natural gas that are consistent with the 2024 EMP's goals. Requiring what are essentially all-electric buildings raises several practical questions that remain unanswered, namely: What resources are needed to reliably and safely meet current and future demand and how should the state proceed to meet that need while also reducing carbon emissions at the lowest possible cost to the consumer?

Energy-efficient, low-carbon buildings could be powered by an innovative combination of natural gas and renewable energy or hydrogen to both lower emissions and utility bills. This is the type of all-of-the-above energy strategy that New Jersey should embrace to help keep costs affordable for consumers while keeping the state on track to meet its emissions reduction goals. API believes that natural gas, in combination with hydrogen renewables and/or renewable natural gas, provides the state with an economical and practical tool for doing so.

TRANSPORTATION SECTOR CONSIDERATIONS

Allow the Market to Determine Supply and Demand Choices

Mandates don't work. When it comes to energy and transportation, consumers and business owners should have more choice, not less. Competition combined with consumer and business preference provide the best approach to accomplishing the state's goals at the least cost and on the fastest timeline.

New Jersey's economy depends on a reliable and affordable transportation fleet powered by energy sources that

[57] *See* https://www.eia.gov/energyexplained/electricity/prices-and-factors-affecting-prices.php#:~:text=Prices%20are%20usually%20highest%20in%20the%20summer%20when%20total%20demand,to%20meet%20the%20increased%20demand.&text=The%20cost%20to%20supply%20electricity%20varies%20minute%20by%20minute.

provide consumers with vehicles they can afford and that does not unnecessarily limit vehicle choice.[58] Regulations that establish annual quotas for the production of zero emission light-, medium-, and heavy-duty vehicles, and policies that ban the sale of new vehicles equipped with internal combustion engines, preclude opportunities to develop other technologies, such as lower-carbon fuels, that can compete to reduce carbon emissions in transportation from both new and existing vehicles.

Deferring Policy Decisions to California May Not Be Right Fit

New Jersey has adopted California's Advanced Clean Cars II ("ACC II") regulation, banning the sale of new vehicles with internal combustion engines ("ICE") for 2035 and all subsequent model years. This program requires Original Equipment Manufacturers ("OEMs") to demonstrate that 43 percent of new vehicle sales in the state in Model Year 2027 are zero emission vehicles ("ZEVs"). As a point of comparison, it is worth noting that in 2024, the state's registered new ZEV sales comprised roughly 14 percent of all vehicle sales.[59] New Jersey has also adopted California's Advanced Clean Trucks ("ACT") regulation which require manufacturers to build zero-emission trucks at increasing percentages beginning in 2024 through 2035.

API encourages the BPU and state policymakers to review the differences between California's population density, geography, weather patterns, transportation demands, and transportation electrification infrastructure (including charging infrastructure for light-, medium-, and heavy-duty vehicles) before continuing with California's regulations. It is worth calling out the fact that New Jersey is unique and should not feel compelled or obligated to follow standards defined by another state nearly three thousand miles away with vastly different topography and air quality.

API respectfully suggests policymakers also analyze the impact on tax revenue generated from changes to gasoline and diesel fuel consumption. Liquid transportation fuels are taxed at both the federal and state level to fund the construction and maintenance of bridges, roads, highways, and other transportation initiatives. State motor fuels tax revenue collections in New Jersey are significant and the state should recognize that typically 95 percent of the federal tax revenue collected in a state is returned by the federal government. Policymakers should analyze the state budgetary expenditures and consumer economic impacts that will be required or incurred to achieve truck and car rule compliance.

New Jersey has Unique Truck Needs

We encourage the BPU to consider that California's ACT program does not recognize the extremely diverse fleet of medium- and heavy-duty vehicles ("MHDV") operating in the state. It has evolved and diversified over decades to meet a wide range of engineering, operating, and durability specifications tailored to the often-unique needs and requirements of many different end-use applications. For example, some vehicles are designed for short urban daily package delivery trips in fleet operations, others are used in inland port freight drayage operations, while still others are engaged in utility maintenance operations, building and highway construction, urban and intercity passenger transit and freight hauling, as well as long-haul freight, to name just a few end-use vocational applications.

[58] Nearly all products that consumers use in the United States are currently transported by truck. See "Trucking in America: Everything you bought in 2021 moved on a truck, CNET (December 30, 2021). *See* https://www.cnet.com/tech/tech-industry/features/trucking-in-america-hidden-truths-about-the-industry-transporting-our-stuff/. *See* also Center for Intermodal Freight Transportation Studies, University of Memphis, "Overview of the U.S. Freight Transportation System" (August 2007).

[59] "NJ Electric Vehicle Data," https://dep.nj.gov/drivegreen/nj-ev-data/, accessed April 15, 2025.

While some companies have announced plans to incorporate electric and zero emission vehicles into their operations, these technologies cannot currently meet the needs of all the end-uses for medium- and heavy-duty fleets when considering factors such as terrain, weather, mileage of the route, and the time available to charge. A study shows that there are 17 applications that account for 91 percent of the U.S. MHDV market and 94 percent of national MHDV emissions.[60] Significant limitations may be placed on MHDV fleets whose needs cannot currently be served by ZEV technology. Some states that previously adopted ACC II and ACT are actively backtracking on these limitations via executive orders and enforcement discretion.[61,62,63]

Efficiencies Have Occurred and Continual Improvements Are Being Made

The vehicle industry has made tremendous progress in recent decades, making ICE vehicles more efficient across all vehicle segments. Consumers in the market for new vehicles will find the efficiency of ICE vehicles has improved by an average of 25 percent over the past 15 years.[64] Real-world CO_2 emissions per mile traveled for new light-duty vehicles have declined 55 percent since 1975.[65] Model Year 2024 new vehicle estimated real world CO_2 emissions are at a record low, and new vehicle fuel economy is at a record high.[66]

A recent study shows NOx and Particulate Matter ("PM") 2.5 vehicle emissions are incredibly low in today's ICEVs, and when compared to an EV, they are nearly identical. Specifically, a Transportation Energy Institute study notes, "[c]omparing EPA NOx emission certification values for all 2019 vehicle models, GREET results indicate that both gasoline-fueled ICEVs' and EVs' NOx emissions will continue to decrease in the future, and all vehicle technology options' NOx reductions from a 1980 NOx level are within 1% of each other."[67]

Examining the results of the authors' investigation into PM, the authors find, "with the transition to ultra-low sulfur gasoline and diesel enabling higher efficiency catalytic converters on gasoline vehicles and the introduction of selective catalytic reactors to control diesel NOx emissions, ICEVs have reduced criteria emissions 97-99%." The study also finds that "[a]ccording to GREET well-to-wheel emission values, today's gasoline and diesel vehicles' tailpipe PM emissions are 98.3% - 100.3% lower than the average 1980 gasoline car and 97.3-99.4% lower on a well-to-wheel basis."[68] In the case of both NOx and PM, the Board should consider there is virtually no difference between EVs and ICEVs. Research[69] indicates unregulated non-exhaust mobile source PM emissions (*i.e.*, road abrasion and tire wear) associated with heavier electric vehicles limits their ability to reduce PM emissions. Furthermore, non-exhaust emissions from EVs are possibly higher than ICEVs.[70]

The industry has made and continues to make significant investments in new technologies that reduce carbon

[60] "The Easiest and Hardest Commercial Vehicles to Decarbonize," by Guidehouse Insights, for the Fuels Institute, April 2022.
[61] Executive Order Number 01.01.2025.10, "Ensuring Success with Advanced Clean Cars II and Advanced Clean Trucks in Maryland", April 4, 2025.
[62] Massachusetts Department of Environmental Protection, "Emergency Regulations and Limited Enforcement Discretion for Advanced Clean Trucks Regulations," October 18, 2024.
[63] New York Department of Environmental Conservation, "Limited Enforcement Discretion Related to the Advanced Clean Trucks and Heavy-Duty Low NOx Omnibus Programs," December 13, 2024.
[64] The 2024 EPA Automotive Trends Report, API calculation.
[65] The 2024 EPA Automotive Trends Report, API calculation for all vehicle types 1975 to 2024.
[66] *See* 2024 EPA Automotive Trends Report, at https://www.epa.gov/automotive-trends.
[67] "Decarbonizing Combustion Vehicles: A Portfolio Approach to GHG Reductions," Stillwater Assoc. for Transportation Energy Inst., p. 69. *See*: https://www.transportationenergy.org/wp-content/uploads/2023/07/Decarbonizing-Combustion-Vehicles_FINAL.pdf.
[68] *Ibid*, p. 64.
[69] *See* https://doi.org/10.1016/j.atmosenv.2016.03.017.
[70] *See* https://doi.org/10.1016/j.scitotenv.2022.156961.

emissions, including: stand-alone production and coprocessing of bio-feedstocks to make renewable fuels; manufacturing of low-carbon ethanol; manufacturing of renewable natural gas from wastewater, landfill gas, and biodigesters at farms as fuel for compressed natural gas vehicles; production of blue and green hydrogen for transportation and stationary applications including building infrastructure; direct air carbon capture; carbon capture and sequestration of CO_2; development of advanced plastics to meet auto industry standards and consumer expectations while mitigating environmental impact through emissions reduction and improved vehicle efficiency by light-weighting; and installation of electric vehicle charging stations.

<u>All Technologies Should Be Allowed to Compete to Reduce Transportation GHG Emissions</u>

Recent forecasts of long-term energy trends, such as those prepared by EIA, indicate that despite projections of growth in the electric vehicle fleet, liquid fuels consumption will continue to be the primary transportation energy source over the next two decades.[71] In recognition of this, the oil and natural gas industry is advancing cleaner fuels to provide consumers with lower-carbon options.

The ultimate trajectory and level of market penetration achieved by electric vehicles will depend on various factors, including: (a) continued reductions in battery costs; (b) improvements in electric vehicle driving range; (c) expansion of the electric vehicle charging infrastructure; (d) federal policies and incentives; and (e) ultimately, market acceptance. Put differently, consumer choice is constrained by what is available, what is affordable, and what is preferred.

For most consumers purchasing a new vehicle, sticker price, fuel cost, and refueling convenience are of primary importance. For example, for consumers that live in multi-unit housing, recharging could be a significant challenge and could be more costly to recharge than for those that can charge at their primary residence. And the trajectory of EV adoption also depends heavily on the assumption that future improvements in EV technology will not be overtaken by unforeseen breakthroughs that may impact the relative energy and environmental performance of other technologies.

Most light-duty vehicles are purchased by the general public. In contrast, most medium- and heavy-duty vehicles are purchased by companies which have specific business needs. If new vehicle technology does not satisfy the business' needs it may compromise the ability of the business to continue to provide services, operate and employ New Jerseyans. Technology-neutral policies create the most efficient and effective opportunities to reduce emissions in the transportation sector for new vehicles, as well as in the existing vehicle fleet.

<u>Energy Security and Infrastructure Readiness</u>

Relying on a single technology, such as electric vehicles, to reduce emissions also creates an unnecessary reliance on foreign nations for supplies. A recent IEA study states, "graphite and rare earth elements may not face supply volume issues but are among the most problematic in terms of market concentration: over 90% of battery-grade graphite and 77% of refined rare earths in 2030 originate from China."[72]

The BPU should also consider challenges associated with the power sector and EV charging infrastructure. In a study

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[71] *See* Reference Case Projection Tables, Table 2, EIA "Annual Energy Outlook 2023."

[72] IEA, *Global Critical Minerals - Outlook 2024,* https://iea.blob.core.windows.net/assets/ee01701d-1d5c-4ba8-9df6-abeeac9de99a/GlobalCriticalMineralsOutlook2024.pdf.

commissioned by the Coordinating Research Council ("CRC"),[73] the authors report, "as the EV market expands, access to home charging is likely to decrease over time" because "most early EV adopters live in detached homes where it is relatively easy to install a home charger, and have relied on low-cost, overnight, at-home charging for their primary charging needs."

Additionally, modeling of a policy that is less stringent than ACC II showed that about 890,000 charging ports (*e.g.*, private and shared access and public direct-current fast chargers) will be required by 2030 and nearly 2.4 million will be required by 2040. Thus, there are other issues to consider before continuing the ZEV requirements included in California's programs.

Additional research by the National Renewable Energy Laboratory[74] and supported by CRC indicates that hybrid powertrain technology may be a more efficient use of battery materials and resources than full-battery electrification, especially in the near term where it is infeasible for BEVs to replace all ICEVs. Additionally, collaborative research by the CRC indicates significant GHG reductions are possible by reducing the carbon intensity of gasoline in the U.S. fleet. [75] Similar concerns persist for the medium- and heavy-duty vehicle segment.

API supports policies that allow for the development of EV infrastructure on a level playing field, where innovation, competitive markets, and consumer choice will result in the best products and services available to the consumer while also meeting policy objectives. As EV charging infrastructure is currently focused on the light-duty vehicle sector and is only used by a small fraction of drivers, allowing utilities to invest in EV charging infrastructure and recover the costs of those investments through regulated cost recovery (*i.e.,* through charges to all their ratepayers) could result in an unfair shifting of costs.

API believes that investments in charging infrastructure should be left to the private sector, which must raise its own capital and, unlike utilities, are not backstopped by a captive rate base of customers. Developers and entrepreneurs may be unfairly challenged and disadvantaged in finding capital (which presents a barrier to entry) when competing with utilities.

In finalizing the 2024 EMP, the state should consider the impacts to consumer and business choice, as well as the implications to U.S. energy and transportation security that could result from overreliance on non-domestic producers and processors of raw materials and batteries.

CONCLUSION

In conclusion, API appreciates your consideration of these comments, which are offered as **constructive feedback** as

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[73] "Assess the Battery-Recharging and Hydrogen-Refueling Infrastructure Needs, Costs and Timelines Required to Support Regulatory Requirements for Light-, Medium-, and Heavy-Duty Zero-Emission Vehicles." by ICF for Coordinating Research Council, Inc., January 2025, *See* https://crcao.org/wp-content/uploads/2025/02/CRC_Infrastructure_Assessment_Report_ICF_01222025.pdf.

[74] Analyzing Potential Greenhouse Gas Emissions Reductions from Plug-In Electric Vehicles: Report for CRC Project, "Carbon Return on Investment for Electrified Vehicles," National Renewable Energy Laboratory, Technical Report 5400-89174, December 2024, *See* https://crcao.org/wp-content/uploads/2024/12/SM-E-20-NREL-Report.pdf.

[75] "Evaluation of the Potential for Significant GHG Emission Reductions from ICEs Operated on Liquid Fuels," Report for Coordinating Research Council, Project No. 0634565, July 2024. *See* https://crcao.org/wp-content/uploads/2024/08/FINAL-SM-1-Report-072224.1.pdf.

part of the EMP update process. We encourage the BPU to **conduct and consider comprehensive cost analysis** to **further instruct and support state policy development** with a **focus on mitigating consumer costs while maximizing consumer choice**.

Thank you for this opportunity, and we look forward to providing additional comments as appropriate.

Respectfully submitted,

Michael S. Giaimo
Northeast Region Director
API Northeast Region
11 Beacon Street, Suite 1230, Boston, Massachusetts 02108
Phone: 603.777.0467, or email giaimom@api.org.