AIR-CONDITIONING, HEATING, & REFRIGERATION INSTITUTE
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2311 Wilson Boulevard Suite 400 Arlington VA 22201 USA
Phone 703 524 8800 | Fax 703 562 1942
www.ahrinet.org

July 1, 2022

Co-Chair, President and CEO Doreen M. Harris
Climate Action Council Co-Chair
NYSERDA President and CEO
NYSERDA
17 Columbia Circle
Albany, NY 12203-6399
Submitted via email to scopingplan@nyserda.ny.gov

NYSERDA President and CEO Doreen M. Harris
DEC Commissioner Basil Seggos

Re: New York State Draft Scoping Plan Comments

Dear Chair Harris and Chair Seggos,

These comments are submitted by the Air-Conditioning, Heating, and Refrigeration Institute (AHRI), on behalf of our member companies, regarding the New York State Draft Decarbonization Scoping Plan.

AHRI is the trade association representing manufacturers of heating, cooling, water heating, and commercial refrigeration equipment. More than 300 members strong, AHRI is an advocate for the industry and develops standards for and certifies the performance of many of the products manufactured by our members. In North America, the annual output of the HVACR and water heating industry is worth more than $44 billion. In the United States alone, the HVACR and water heating industry supports 1.3 million jobs and $256 billion in economic activity annually.

AHRI and its members, who are HVACR and water heating manufacturers, are committed to greenhouse gas (GHG) emission reductions, while promoting sustainable, reliable, and affordable access to the essential heating and cooling provided by the products they design and manufacture.

Many of AHRI's members include the nation's largest manufacturers of products, such as electric equipment used for space and water heating equipment for use in residential and commercial end-use applications, that can assist the Climate Leadership and Protection Act (CLPA) Climate Action Council (CAC) goal of greenhouse gas (GHG) emissions reducing policies, programs, or actions that contribute to achieving the statewide reductions established in New York's Draft Scoping Plan.
As an industry, we believe there are important considerations that must be made by policymakers when assessing electrification and building decarbonization policies. AHRI hopes to be a resource and partner in New York's development of measured steps that will both achieve carbon emissions and increase the likelihood of success in achieving carbon emission reduction targets.

AHRI appreciates the current stakeholder informational sessions and strongly recommends that policymakers listen to all stakeholders, while considering potential benefits and unintended consequences of various policy proposals. Especially considering that energy and the technologies it powers, whether for heating, cooling, water heating, or refrigeration are vital to the health, safety, productivity, and comfort of the American people.

- For example, high costs of conversion will drive homeowners to repair, rather than replace, less efficient equipment.
- Continued high heating and cooling loads will destabilize electricity grids or cause additional assets to be built at significant added cost.
- Of course, health and safety of the residents and businesses of New York is paramount in this transition.
- An overly prescriptive regulatory framework could stymie innovation.
- A regulatory framework should allow for corrections or to address unanticipated issues such as the supply chain issues that we have recently seen related to low global warming potential foam blowing agents and their associated foams.

Finally, success in reducing greenhouse gases will depend on building the support of stakeholders to make reasonable tradeoffs, without losing access to critical services. There is no perfect technology, no failsafe plan, no magic bullet that will allow New York to quickly and easily reach targeted emissions reductions.

AHRI Recommendations

AHRI reviewed the New York State Draft Scoping Plan[1] and recommends that New York work to:

- conduct emissions and cost savings analyses consistent with the full spectrum of product efficiencies and available technologies in North America;
- use available data sources (EIA, CBECS, etc.) to establish a base line distribution of fuels and equipment within the state at the household and individual commercial building level;
- shift building codes to performance-based requirements and require that existing large commercial buildings track energy usage;
- ensure that any recommendations demonstrate cost effectiveness and equity for all residents;
- consider grid reliability and capacity as it impacts critical services provided by HVACR and water heating equipment for all residents;
- adopt an incentive program to encourage the adoption of emissions-reducing appliances, and update its study of market efficiency to include a market shift anticipated by programs that incentivize improved efficiency equipment;
- follow a technology agnostic approach; and
- adopt the latest version of ASHRAE 90.1 or its equivalent into their building codes.

[1] Accessed via https://climate.ny.gov/-/media/Project/Climate/Files/Draft-Scoping-Plan.ashx

AHRI recommends that New York State conduct emissions and cost savings analyses consistent with the full spectrum of product efficiencies and available technologies in North America.

AHRI asks that New York consider the full spectrum of products installed in the state in its 2021 Clean Energy Industry Report[2]

Performance-based decarbonization policies that do not favor certain technologies over others will prevent inadvertent emission increases while electricity generation still relies on inefficient and carbon-intensive power plants. For example, dual-fuel heating systems are comprised of an electric heat pump and a natural gas furnace. The heat pump is used to meet the heating load of a building until it reaches capacity, at which point the gas furnace is used to meet the supplemental building heating load and maintain the heating setpoint temperature. Incorporating these systems into decarbonization policy in New York is a critical step to avoiding increased emissions and ensuring sufficient heating in colder climates.

Natural gas and other fossil fuels are used in electricity generation for daily average demand or baseload as well as for peak electricity demand when the baseload supply is insufficient. A study by U.C. Davis explores the greenhouse gas footprint of electricity generation by state. According to the study, there are higher marginal emissions from plants providing additional electricity during periods of peak demand including higher emissions than that of natural gas used directly in heating equipment.[3] The "peaker plants", which supply this additional electricity during periods of high demand during very cold days, should be incorporated into life cycle analyses of emissions of heating equipment.

A thorough analysis of electricity generation capabilities and limitations is an important step in determining a pathway to minimize greenhouse gas emissions. For example, , building electrification could result in an increase in greenhouse gas emissions and would benefit more from market-based incentives to upgrade the current mix of heating equipment.

AHRI strongly supports further development of New York State study of the full range of HVACR equipment within the state including all efficiencies and capacities of furnace, heat pump, and other potentially targeted products to better understand the distribution of fuels and equipment used within the state. This will allow New York State to create more effective policies that help achieve its goals in the instances where there are cost-effective market-based drivers for consumers to switch to new or more appropriate technologies. Use of this inventory will better estimate the energy savings potential the state can achieve.

AHRI recommends that New York State use available data sources to establish a base line distribution of fuels and equipment within the state at the household and individual commercial building level.

[2] 2021 Clean Energy Industry Report. January 2022. Accessed via https://www.nyserda.ny.gov/-/media/Files/Publications/Clean-energy-industry/2021-CEI-GEN-report.ashx

[3] Nelson Ditcher, Aref Aboud, *Analysis of Greenhouse Gas Emissions from Residential Heating Technologies in the USA* p.8 (2020).

Based on AHRI's analysis of the U.S. heat pump market[4] ,[1] New York State likely contains approximately 3.7 percent of all heat pumps installed across the country. Residential buildings are powered primarily substantially by natural gas in New York (32% in 2019, according to the Lawrence Livermore National Laboratory (LLNL)).[5]

New York State can use its understanding of the baseline market of HVACR equipment to analyze the efficacy of its policies. With this understanding, New York State will also be able to share how its market transformation can occur. It is worth noting that according to the 2020 UC Davis Western Cooling Efficiency Study,[6] Dual-fuel heat pumps achieved greater CO2 reductions in comparison to the all-electric heat pumps for all states in the Northeast region, including New York, and variable-speed dual-fuel heat pump produced the least annual CO2 emissions of the 4 heat pumps simulated in all nine states of the Northeast region of the USA.

AHRI looks forward to sharing data and resources with New York State to compare data to ensure this robust analysis is as accurate as possible.

AHRI recommends that New York State shift building codes to performance-based requirements and require that existing large commercial buildings track energy usage.

The preliminary draft recommendations state that New York State should measure energy usage and make that information accessible to inform later energy performance standards for commercial buildings. AHRI supports the requirement for private commercial buildings greater than 10,000 square feet where the benefit is more likely to justify the significant cost of energy modeling that is unique to each building.[7],[8] AHRI believes this will help New York State achieve its future goals, as identified in the New York State Draft Scoping Plan.[9]

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[4] The installed base of HVACR and water heating equipment is publicly available from the Energy Information Administration (EIA) Residential Energy Consumption Survey (RECS) and Commercial Building Energy Consumption Survey (CBECS).

[5] LLNL Energy Flow Charts. Accessed via https://flowcharts.llnl.gov/commodities/energy.

[6] Dichter and Aboud: *Analysis of Greenhouse Gas Emissions from Residential Heating Technologies in the USA* September 15, 2020 https://wcec.ucdavis.edu/wp-content/uploads/GHG-Emissions-from-Residential-Heating-Technologies-091520.pdf last accessed April 9. 2020

[7] New York City Mayor Michael Bloomberg signed the Greener, Greater Buildings Plan in 2009 that required facility owners of private buildings over 50,000 square feet to annually benchmark energy. The area requirement for public buildings – 10,000 square feet – was considerably lower and conducted for public benefit rather than a cost justified emissions reduction measure. Only after a decade of benchmarking was the market ready to extend the requirement for private buildings to 10,000 square feet. Buildings with complex systems have greater opportunities to improve efficiency through lower-cost options, such as updates to the building automation system, whereas smaller buildings, with simpler systems, have few opportunities beyond schedule optimization and proper equipment maintenance.

[8] Note that energy modeling costs were not included in the report and should be considered as they are significant and unique by building.

[9] Draft Scoping Plan. December 30, 2021. Page 123. Accessed via https://climate.ny.gov/-/media/Project/Climate/Files/Draft-Scoping-Plan.ashx.

AHRI recommends that New York State ensure that any recommendations demonstrate cost effectiveness and equity for all residents.

AHRI encourages New York State to consider consumer equity in its decarbonization policies. Policies dependent upon building electrification for reducing emissions, if not carefully executed, may place an undue burden on low- and medium-income families. Cost impacts from this switch are likely to disproportionately affect low-income households. AHRI recommends that New York State perform a holistic cost-benefit analysis of any decarbonization policy and ensure that any recommendations are equitable to all its residents, especially examining the capital cost of rewiring buildings and venting equipment and increased operational costs of equipment.

Cost is often the key factor in consumer decision making, with comfort a close second. Regardless of its ability to save money during its lifetime, equipment with significant upfront cost premiums, that also is perceived (rightly or wrongly) as providing insufficient comfort or convenience, is less attractive in the marketplace, so subsidies, education, technological development, and a reasonable transition period all are imperative for success.

There are a broad range of economic and energy efficient options allowing nearly every citizen, regardless of economic status or geographic location, access to the comfort of life-saving heating, cooling, and hot water they need. As an industry we strive every day to provide the best, most efficient options available for the betterment of society. This will allow for the greatest amount of environmental benefit with the least amount of economic disruption.

AHRI can provide expertise in the multiple technologies and practices that exist to significantly reduce emissions, while at the same time enabling consumers to have the affordable, reliable heating, cooling, water heating, and commercial refrigeration equipment on which they depend for their health, safety, comfort, and productivity.

AHRI recommends that New York State consider grid reliability and capacity as it impacts critical services provided by HVACR and water heating equipment for all residents.

Separately, as decarbonization policies become more pervasive, load on the grid increases which could limit energy reliability in New York State. In addition, in rural areas where the electricity grid is unreliable, families and businesses may have to rely on other energy sources especially for heating due to frequent failures in power supply.

New York may wish to work with utilities and other stakeholders to develop a “Grid Readiness Test” to determine whether local grids have sufficient capacity and reliability to transition to a higher volume of electric heating equipment, and whether the greenhouse gas intensity of electricity produced is sufficiently low so that any additional equipment would result in greenhouse gas emissions reductions.

AHRI supports New York State in adopting an incentive program to encourage the adoption of emissions-reducing appliances and update its study of market efficiency to include a market shift anticipated by programs that incentivize improved efficiency equipment.[10]

AHRI supports incentive programs (including for training) to encourage the adoption of high efficiency appliances, such as air source heat pumps (ASHP), water source heat pumps (WSHP), and ground source heat pumps (GSHP). As New York State has identified, incentive programs have been effective in driving the adoption of high efficiency appliances in other jurisdictions. For example, groups like the Consortium for Energy Efficiency (CEE) have been successful in driving the installation of higher efficiency equipment across the U.S. In 2017, demand side management (DSM) programs saved approximately 33,246 GWh of electricity.[11]

In addition, training and policies that ensure the appropriate sizing of equipment, including heat pumps, is critical to maximize energy efficiency and to minimize energy consumption during peak demand, especially during cold winter nights.

New York State should update its study of market efficiency to include a market shift anticipated by programs that incentivize improved efficiency equipment as the federal equipment efficiency incentives will likely lead to a market shift that New York State should include in its assumptions. For example, AHRI has found that owners of existing buildings can achieve substantial energy savings by replacing outdated technology with both fuel-burning and electric new space heating products. This replacement of equipment should also be incentivized.

AHRI supports New York's consideration of the potential for incentivizing distributed energy resources including the use of heat pumps (see page 38 of scoping plan). AHRI also recommends incentivizing dual fuel heat pump/furnace systems –which do not require a heavy increase on electrical service panel load as these systems can dramatically lower building emissions and help manage peak electric loads. Any transition to all-electric heat pumps in existing homes should be incentivized and include the cost of an electric service panel increase.

Most replacements occur in emergency situations -- no heating, cooling, or hot water – so consumers will demand the most expedient solution, usually a like-for-like replacement, unless they can make changes with minimal additional costs.

Incentives will encourage consumers to be less wary and discourage less-affluent consumers to repair older, less efficient systems, rather than moving toward more efficient systems. Beneficial electrification programs should consider these costs (e.g., electrical service panels and ducting) and prioritize whole-home and whole-building solutions to ensure any policy results in reduced greenhouse gas emissions.

[10] Incentives for the adoption of high-efficiency appliances provides states with an effective means of driving the use of high efficiency appliances without adopting requirements that conflict with Department of Energy regulations federal preemption clause to ensure that the unintended consequences of the creation of a patchwork of regulations do not develop across the country.

[11] CEE Annual Industry Report 2018 State of the Efficiency Program Industry

AHRI also supports incentives and policies to install energy storage, such as batteries, in buildings, especially to provide alternate power for space-heating. New York State should also consider load-shedding policies such as those included in AHRI 1380.

New York should study and report on wholesale and retail demand response needed programs for water heating grid-interactive buildings.

AHRI recommends New York State follow a technology agnostic approach.

All technology providing significant energy and environmental benefits should be evaluated, regardless of fuel type considering consumer choice, technological neutrality, and ultimate affordability in terms of both upfront and operating costs.

Performance-based decarbonization policies can result in reducing emissions more quickly. As an example, when looking at liquid fuels (Heating Oil) used for home and water heating, the quickest path to lowering emissions is using renewable liquid fuels. In fact, using a renewable liquid fuel results in lower emissions today. Equipment approved for higher blend levels of biodiesel and renewable diesel can be used in equipment in service today, in many cases without the need for any expensive equipment upgrades. Decarbonization benefits can be realized immediately. We strongly urge that performance-based decarbonization policies be implemented rather than picking a specific technology and assuming it is the optimum solution. The current plan disincentivizes innovation with its "one-size-fits-all" approach and likely delays, if not prevents, future improved solutions.

AHRI recommends that New York State adopt the latest version of ASHRAE 90.1 or its equivalent into New York State's building codes.

ASHRAE 90.1 is a model code that sets standards for HVAC equipment, boilers, and water heaters and is regularly updated to ensure its applicability to the latest technologies. Updating New York State building codes with the latest version of ASHRAE 90.1 or its equivalent will maximize the efficiency of equipment and the relevance of building requirements within the state. Adopting the latest version of ASHRAE 90.1 would also introduce an opportunity to align building requirements among both state and local jurisdictions.

AHRI supports the Scoping Plan proposal to reduce heating and cooling load of existing and new buildings.

Reducing the heating and cooling load by improving structures and providing incentives to help those who cannot afford the cost of these improvements, especially in existing building stock is a common-sense approach to reducing greenhouse gas emissions in existing and new building stock.

Continued high heating and cooling loads will destabilize electricity grids or cause additional assets to be built at significant added cost. This will be a critical step in the near-term and long-term to reducing costs and greenhouse gas emissions.

AHRI supports the Scoping Plan proposal to continue to allow access to supplemental heat with multiple fuel options.

Dual-fuel heating, and other back-up heating options, will be imperative to ensure continued access to life-saving heating during disruptions to the electric grid and during cold temperature weather.[12] This especially important as cold climate technologies continue to develop as evidenced by the Department of Energy *Cold Climate Heat Pump Challenge*[13].

Use of technologies that are insufficient to meet consumers need for life-saving heat will result in the use of expensive electric resistance heating during cold spells. This is more expensive for consumers and will increase peak electricity demand increasing costly infrastructure needs.

When consumers have a Heat Pump with an oil- or gas-fired back-up system in parallel, in high electric demand conditions they would have the ability to "shut-off" the high demand heat pump and keep heating using the back-up system. This type of Manual Demand Response would protect consumers from the cold during times of extreme cold weather. By using renewable fuels like green natural gas, renewable diesel or biodiesel, the back-up systems will have lower greenhouse gas emissions than traditional fossil fuel systems.

The North American Electric Reliability Corporation (NERC) has warned that there is a risk of blackouts across the country this summer[14]. One of the reasons cited was rising demand in combination with the slower pace of the transformation of the electrical infrastructure to more renewable sources with larger capacity. The outline in the Scoping Plan to replace the energy currently used to heat buildings in the winter to all-electric will create peak electric demand in the winter, exasperated during cold snaps. This will stress the grid creating the same issue in the winter that currently exists in the summer and could result in winter "blackouts". To date the transformation to renewables sources for the electrical infrastructure with increased capacity has not moved quickly. The automotive industry and EVs provides an example. Even with the American Rescue Plan earmarking $5B for charging stations (electrical infrastructure) everyone acknowledges more will be needed to support the transition to EVs.

Hydrofluorocarbons

The American Innovation and Manufacturing (AIM) Act phases down the supply of hydrofluorocarbons to 15% of the baseline average supply from 2010 to 2012, nationally.

The available supply of HFCs will be limited by the AIM Act to 60% of the baseline in 2024, 30% in 2029, 20% in 2034 and 15% in 2036 and beyond. The AIM Act also allows EPA to set demand side global warming

[12] According to EPA, there have been more than 19,000 cold-related deaths in the United States since 1979. EPA also states that there is increased risk of cold-related illnesses for older adults, infants, people with pre-existing medical conditions, people taking medications that make them more susceptible to cold effects especially for those with inadequate winter clothing or home heating.

[13] More details about the Department of Energy *Cold Climate Heat Pump Challenge* can be found here. https://www.energy.gov/eere/buildings/residential-cold-climate-heat-pump-challenge

[14] Malik et al; Vast Swath of US at Risk of Summer Blackouts, Regulator Warns https://www.bloomberg.com/news/articles/2022-05-18/vast-swath-of-us-is-at-risk-of-summer-blackouts-regulator-warns

potential (GWP) limits and transition dates. AHRI has submitted petitions, that EPA has granted to create those limits for AHRI member equipment.

Successful implementation of the AIM Act requires best practices with respect to refrigerant management, including recovery, leak reduction and re-use of reclaimed refrigerants. Should one jurisdiction choose to further regulate GWP limits, additional refrigerant will become available for other jurisdictions removing the need for this important level of discipline.

AHRI requests a discussion with the Climate Action Council and the Department of Environmental Conservation to discuss policy options that will ensure best practices related to refrigerant management, that will reduce emissions related to refrigerants, rather than shifting supply to other states.

AHRI recognizes that New York State may benefit from data and technical information from AHRI. New technologies and product availability, based on necessary testing and supply chain requirements, may be difficult for New York State to ascertain. AHRI is uniquely positioned to provide that information to New York State as well as the needed steps to bring new technologies to market.

AHRI is appreciative of these opportunities to provide feedback and requests a meeting with New York State and the Climate Action Council on this important issue, as it has proven difficult to understand how to engage in this process.

Should you have any questions regarding this submission, please do not hesitate to contact me.

Respectfully,

Helen Walter-Terrinoni

Helen Walter-Terrinoni
Vice President, Regulatory Affairs
Air-Conditioning, Heating, and Refrigeration Institute
2311 Wilson Blvd, Suite 400
Arlington, VA 22201

cc: Global Warming Solutions Act (GWSA) Implementation Advisory Committee (IAC)