Testimony in favor of revising House Bill H 5167, The Rhode Island Clean Heat Standard Act

Submitted to: Louis Mansolillo, Committee Clerk, HouseEnvironmentandNaturalResources@rilegislature.gov

By: Kevin O'Neill <koneill@alum.mit.edu> on behalf of Citizens Climate Lobby (Rhode Island chapter), 2/5/2025

The Rhode Island chapter of Citizens Climate Lobby applauds the intent of the proposed Clean Heat Standard (CHS) -- to impose additional fees on the sale of non-renewable heating fuels in the state and to use that new revenue to accelerate and make the installation of electric heat pumps more equitable. Fundamentally, we agree with those objectives. But we have three concerns about the current draft:

- It requires creating and managing a new market for intangible, tradeable, "clean heat credits" – which strikes us as an unnecessarily complicated, time-consuming, and expensive way to impose additional fees on non-renewable fuels.
- It does not address how we will keep Rhode Islanders warm when most of the power needed for electric heat pumps will, by law, be coming from renewable power sources.
- It acknowledges neither the potential nor the importance of using heat pumps to drive down or stabilize the cost of building heat for residents and business owners.

In this written testimony we offer recommendations for changes to the current draft that would eliminate those three concerns. And we offer information that explains the substantial economic and resilience benefits of an appropriately designed Clean Heat Standard

BACKGROUND

Why do we need a Clean Heat Standard focused on the electrification of building heat?

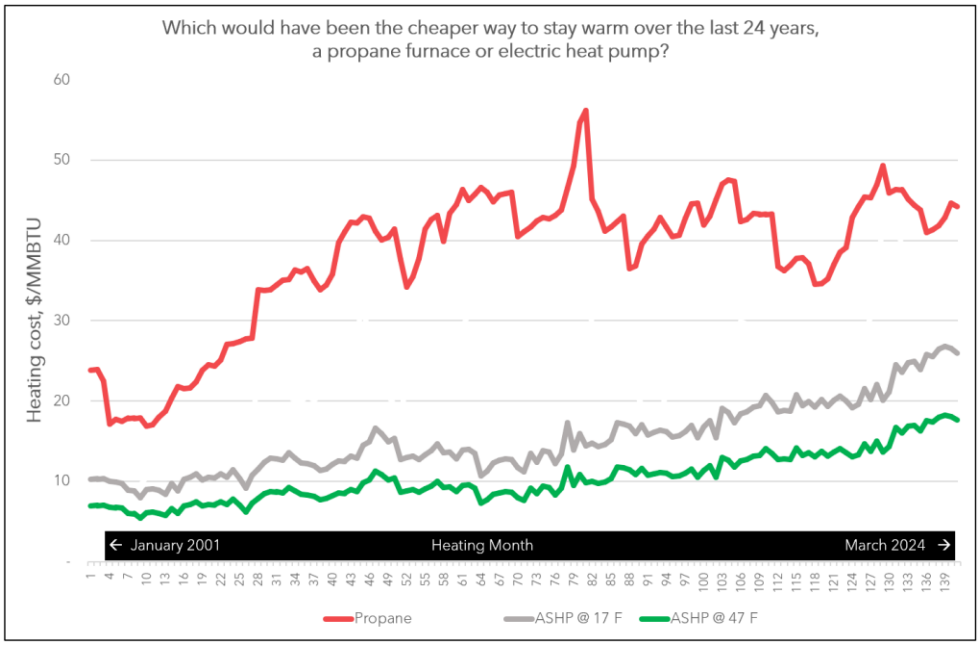
Buildings account for more than 1/3 of the emissions that the Act on Climate pledges to eliminate by 2050, nearly as much as from all vehicles. Those building emissions arise almost entirely from the combustion of natural gas, fuel oil, and propane to keep buildings warm and to make hot water. Those emissions can be nearly eliminated by switching from furnaces and boilers to electric heat pumps. And the Future of Gas study conducted for the Rhode Island Public Utilities Commission established that meeting the emission reduction goals of the Act will require electrifying 50-100% of building heat with heat pumps, shifting heating loads from furnaces and boilers to heat pumps.

Heat pumps can reduce winter heating costs.

For every unit of electrical energy put into a heat pump, roughly three units of thermal energy are put into a home. (That ratio of energy out to energy in is known as the coefficient of performance or "COP".) In contrast, old fashioned, electric resistance baseboards provide just one unit of thermal energy for each unit of electricity put in. So, any Rhode Island resident currently depending on electric resistance heating could slash their heating costs by 66% if they had the option of using a heat pump instead,

Furnaces and boilers are even less efficient than electric , less than one unit of energy is put into the building. To determine whether a heat pump would provide heat more efficiently than a furnace, we need to know the relative prices of electricity and the fuel used in the furnace; and those prices vary over time. We also need to know the COP of the heat pump (which might be between 2.0 and 5.5, depending on the outdoor temperature and heat pump design), and the efficiency of the furnace (which might be between 80% and 98%). But if we pick some typical COP and furnace efficiency values, and then take recent price histories as indicators for how prices might be in the future, we get a chart like Figure 1.

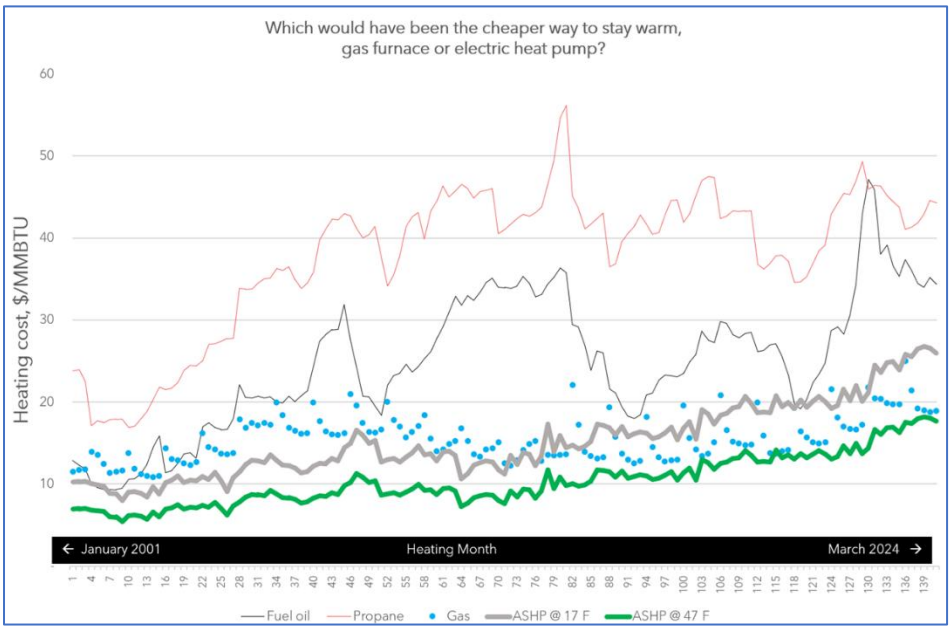
Figure 1



Over the past 24 years, comparing an air-source heat pump (ASHP) to a propane furnace, the heat pump would have been the better choice. The homeowner would have cut their heating cost roughly in half by using the ASHP rather than the furnace. The result would be roughly the same if comparing the ASHP to an oil furnace.

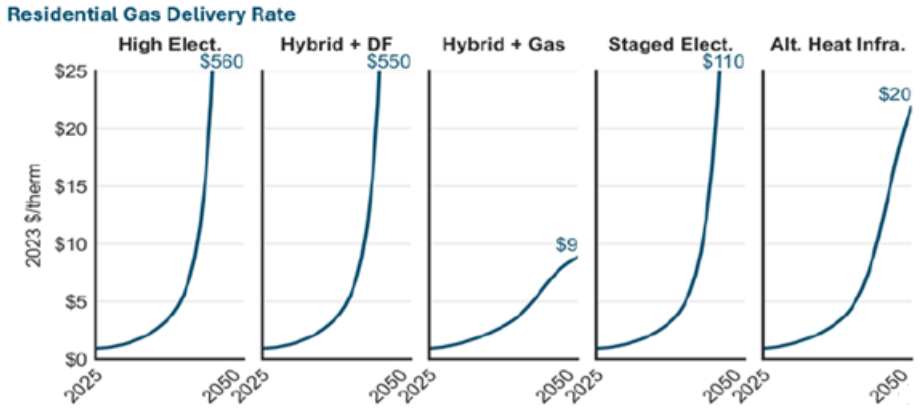
Natural gas, as shown by the blue dots in Figure 2, has been cheap enough to cancel out the efficiency advantage of the ASHP on many winter days. But if the temperature is above 45°F and a heat pump is available, a home owner can save money by running their heat pump rather than their gas furnace.

Figure 2



Gas will not be cheap in the future

In 2024, the *Rhode Island Investigation into the Future of the Regulated Gas Distribution Business,* conducted for our Public Utilities Commission, reported that under any credible scenario the cost of natural gas will go up. The scenarios that we think are most likely could cause the price to rise sharply within 5-15 years.



The price increase might be managed to some degree, particularly if the investment returns now paid to the regulated gas utility company by gas customers are instead "securitized" and shifted to all Rhode Island tax payers. But an increase in the price per therm (i.e. per unit of gas consumed) is mathematically certain because of this relationship (simplified for discussion purposes):

$$[\text{Gas distribution cost, per therm}] = \frac{[\text{Return on capital investment}] + [\text{Maintenance costs}] + [\text{Administrative costs}]}{[\text{Total quantity of gas sold}]}$$

The dollar costs in the numerator of that equation are largely fixed. The denominator, the quantity of gas sold, responds to market conditions. As the quantity of gas sold declines – because buildings are made more efficient and heat pumps displace gas furnaces – the price per therm distributed must increase. As that unit price increases, switching to a heat pump becomes an even more attractive proposition, causing more heat pumps to be installed. The rising price of gas causes the heat pumps already installed to be the cheaper source of heat at even lower temperatures. So, ever less gas is purchased… until the only people left on the gas system are those who could not afford to install heat pumps.

The Clean Heat Standard should be designed to ensure that most people who will need to be protected from a rising gas price can have heat pumps in place when we hit the inflection point anticipated by the curves above.

Heat pumps are essential for adapting to hotter summers and are being sold for that reason.

We all know that summers are getting hotter. Old air conditioning systems and cheap window units have historically been the cause of peak electricity demand and strain consumers' spending in summer months. Modern heat pumps are quieter and more efficient. Fundamentally, the installed cost of a heat pump is not much more than for a new AC unit, and that explains why heat pumps now outsell gas furnaces. Heat pumps are useful year-round and can save consumers money year-round.

Reliable funding is needed now if the efficiency advantages of heat pumps are to be enjoyed by all.

In July of last year, Governor McKee righty applauded the news of a $450 million Climate Pollution Reduction Grant from the U.S. Environmental Protection Agency to the New England Heat Pump Accelerator program. The Accelerator is designed to overcome systemic barriers to residential building electrification at this critical moment in our region, bringing down costs, growing the workforce, and raising awareness in five states (CT,

MA, ME, NH, and RI). In February of this year the Trump administration paused that grant money and it is unclear if Rhode Island will receive the $35-40 million benefit expected.

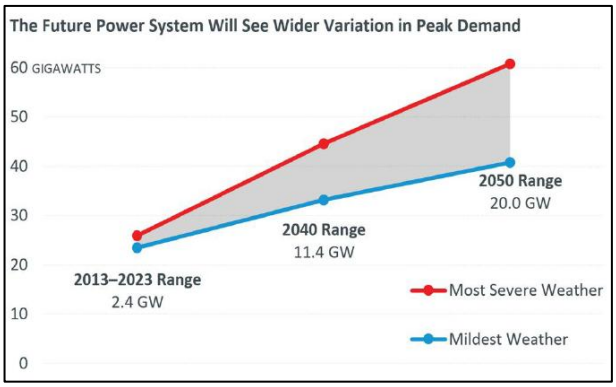
Even when the Accelerator succeeds, lower income residents and businesses will need access to financing and technical assistance for heat pump investments. Funding that assistance through an efficiency fee on electricity bills would be counterproductive. In contrast, funding it through an efficiency fee on fuel bills would align price signals with the Act on Climate goals, and that price signal could be increased or decreased by the state as necessary to achieve those goals on schedule.

We recommend adjusting the price signal slowly, perhaps starting with a 1% increase in the cost of heating fuels, and announcing plans to increase the signal at a slow annual pace, perhaps 1% per year. If, after a year or two, it is apparent the price signal is too weak to decrease emissions at the rate required by the Act on Climate, then increase the annual rate of increase. If market forces are decreasing heating emissions more quickly than required, then decrease the annual rate of increase. Predictable price increases, even if subject to change in the future, will be used by heat pump vendors in their sales pitches to consumers and will help consumers take more seriously the cost-saving potential of a heat pump.

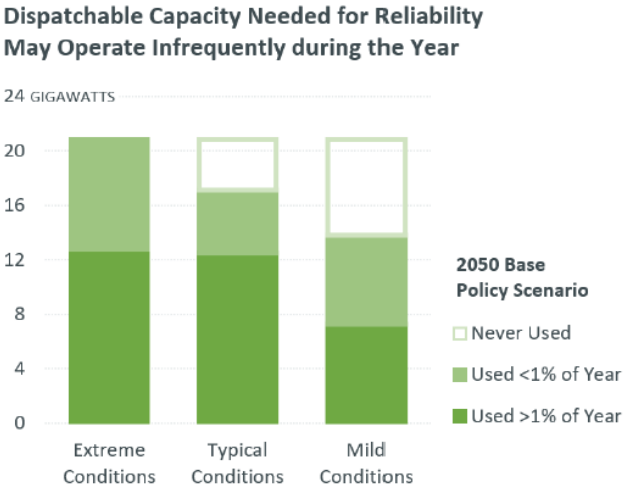
We will need furnaces and boilers for backup heat for the foreseeable future.

Some think that the goal of the Clean Heat Standard is to eliminate entirely the combustion of any heating fuels. We don't. We think heating fuels will remain essential for reasons of safety, resiliency, and economy.

Late last year, a remarkable conclusion was presented in a study titled *Economic Planning for the Clean Energy Transition: Illuminating the Challenges of Tomorrow's Grid*, from the manager of our regional electricity grid, ISO New England. The study correctly anticipates that the electrification of building heat will tip the grid into a new operating regime. Peak demand will occur in winter rather than in summer, and the variability in peak demand will be much greater because our winter temperatures are fluctuating more from one year to the next.



The study, as we understand it, assumed that peak electricity demand would be accommodated primarily by adding more generating capacity. And because of the increasing variability of temperatures in winter, much of that new capacity would be rarely used.



In their words, "Renewable-only build-outs may be vast, and later additions of renewable resources could have diminishing environmental and economic returns." But it does not have to be that way.

If most people installing heat pumps can keep their existing boiler or furnace in good operating condition, then when electricity demand threatens to exceed supply some of those old heating appliances could be turned on and some of those heat pumps could be turned off. Collectively, the demand management capacity of building heating systems in New England could be equivalent to a dozen nuclear reactors or large gas-fired peaking plants. And it will be a lot

cheaper to maintain existing fuel-fired heating systems than to build 20 GW of new generating capacity. We believe the Clean Heat Standard can be the answer to a simple question. Should we increase electricity costs for all New Englanders by building a lot of generating capacity that will be rarely needed, or should we keep existing heating systems in place for electricity load-shedding purposes?

Of course, there is another reason to keep old heating systems in place when installing heat pumps. Like any other appliance, a heat pump might fail and need repair. When that happens in the dead of winter, do we want to wait anxiously for the repair to be done, watching the temperature in our house get colder and colder? Or would we prefer to turn on the old heating system that has been silently maintained in our basement for this moment?

And then there is the reliability of the local electricity grid. If tree or branch, felled by high wind or heavy snow, just took out the electricity to your neighborhood, you are unlikely to have a generator larger enough to run your heat pump. But you could easily have a generator or battery backup system large enough to run your old heating system. Some of us have been in exactly that situation several times over the past several years, for days at a time. We are thankful we had that backup equipment in place.

Delivered fuels are perfect for backup purposes.

When we are dependent on an old oil- or propane-fired furnace for backup heat, but are kept warm by heat pumps most of the time, we will not need much backup fuel. Those of us who have already lived that experience know that we need consume less than 5% of what we consumed before installing the heat pumps. Today, by law, 10% of the fuel oil consumed in Rhode Island is biofuel made from waste cooking fat and other sources. That percentage is slated to increase to 20% this summer, and it could be increased to 100% if the supply of biofuel was available. The supply will be sufficient in the future. We are consuming, today, more renewable biofuel than we will need for backup purposes in 2030 or 2050. And it is really easy to store that biofuel in our existing oil tanks.

Renewable propane is not so readily available today but it probably will be available in sufficient quantity in the future. The civil aviation industry, worldwide, has committed to the adoption of sustainable aviation fuels (SAF). Propane and butane, the principal components of LPG, are created as byproducts from the most likely processes to be used for SAF production. So, if you are currently staying warm thanks to deliveries of propane (LPG), your existing propane tank and furnace could be the answer to your prayers when a power line goes down in 2035.

The backup heat specialists we need are our friends and neighbors. They could use more help.

Most of the companies currently delivering heating oil and propane in Rhode Island have diversified into HVAC (heating, ventilating, and air conditioning) services and are already installing and servicing heat pumps. Many of them are family-owned businesses that have kept our homes and businesses comfortable for generations. Over the past forty years, as the gas utility gobbled up market share and as homes became more efficient, the HVAC portion of their business was what allowed them to grow. We expect that pattern of declining fuel deliveries and growing HVAC sales and service to continue.

We need those companies to install the heat pumps and provide the backup fuels mentioned above. And they need more help. Good HVAC technicians are hard to find and those companies need more of them. That is why workforce development is an important component of the Accelerator mentioned above. HVAC techs earn above-average wages and their jobs cannot be replaced by AI (artificial intelligence). Reducing the emissions from building heat – by weatherization, air-sealing, and electrification of existing buildings and by

the construction of new buildings – will take many years, ensuring good jobs for many good people in Rhode Island for a generation.

Heat pumps can help to drive down and stabilize the cost of electricity

An equation, similar to the one shown on page 3 to explain why the delivered priced of natural gas will inevitably increase, applies to the price of electricity. But since the denominator is growing for electricity, not shrinking like gas, the price effect is the opposite. If all other things remain the same, the price of electricity should go down as building heating systems are electrified.

The electricity system is complicated but, thus far, the fixed costs of electricity generation, transmission, and distribution have been determined by peak demand in summer. On a typical homeowner's electric bill, the delivery charge is bigger than the supply charge. And only a fraction of the supply charge is due to the variable cost of fuels burned to make the electricity.

On an annual basis, the average load on New England's electric grid is roughly half of the historic summer peak. Over the next 5-10 years, as heat pumps and electric vehicles come online, summer peak demand will rise slowly and that increase can be mitigated by using EVs and batteries as demand management assets. The winter peak will rise more quickly, and that peak can also be managed by using heating systems and demand management assets. The net effect of the increasing electric loads should be an increase in the average utilization factor of the entire generating/transmission/distribution system. Essentially, by spreading those costs (largely fixed) over an increasing number of kWh consumed should result in a lower cost of delivering each kWh.

As we have all seen over the past few decades, supply disruptions due to weather or geopolitical conflicts, and the price volatility common to most commodity markets, combine to give us occasionally unpleasant shocks in our fuel bills. The cost of electricity has been, and will remain, more stable and predictable than the price of gas, oil, or propane. So, the transition from fossil-fueled heat to electric heat pumps will not only exert downward pressure on electricity prices for consumers but also provide greater price stability for those who worry about household or businesses heating budgets.

Why not build the Clean Heat Standard around clean heat credits?

Consider the plan outlined in the current draft of the Clean Heat Standard. It requires:

1. **Creating a market for intangible clean heat credits**. Each clean heat credit would (theoretically) correspond to the persistent elimination of a certain amount of greenhouse gas (GHG) emissions from the combustion of fossil fuels. (While based on pounds of CO_2 equivalent not emitted, a credit would typically be denominated in public conversation as equivalent to a certain number of gallons of fuel oil or cubic feet of gas saved.)
2. **Requiring the EC4 to establish how many clean heat credits, in total, should be purchased or created each year**. The total annual volume, across all years, should be sufficient to meet the emission reduction targets of the Act on Climate.
3. **Requiring the EC4 to determine what fraction of the total annual credits that must be purchased by each obligated party – i.e. by the gas utility company (Rhode Island Energy), and by each entity making the first sale of any other heating fuel to be consumed within the state.** This fraction will be in proportion to the GHG emissions arising from the combustion of the fuels they sold into the state in the prior year.
4. **Requiring the EC4 to identify a list of actions that would reduce emissions,** such as: improved building insulation and air sealing, installing different kinds of heat pumps, and selling electric stoves or dryers.

5. **Creating a system to recognize clean heat credits** as they are created by HVAC contractors, insulation and weatherization contractors, the gas utility, and others when they perform those actions for their customers (or, conceivably, when building owners perform such actions themselves).
6. **Engaging a "default agent" to create more credits** as necessary to ensure 40% of all credits arise from reducing fuel us in the homes of low-income and moderate-income residents.
7. **Setting the price of clean heat credits sold by the default agent.**
8. **Ordering an obligated party to make a noncompliance payment to the default agent** if they have not or cannot purchase the requisite number of clean heat credits.
9. **Allowing the market price of clean heat credits to rise or fall** as obligated buyers and credit-creating sellers or credit traders negotiate the price of clean heat credits. (But, if this market functions anything like similar emission-reducing credit markets, the EC4 will probably need to impose guard rails on the price of credits.)
10. **Adjusting the annual credit obligations when necessary,** for example, if supply is insufficient to meet total demand as stipulated by EC4, or if the price of credits rises so high as to adversely impact particular customers or demographic segments.

Simple, right?

Last week, the Office of Energy Resources suggested that it will take years for the state to solve a much simpler problem of collecting data on fossil fuel use in building and setting building performance standards. So, we expect that the Clean Heat Standard, as written, would take several years to implement. It would obviously require increased staffing in state government or increased use of consultants or contract administrators to manage that clean heat credit market.

We believe it would be simpler, faster, less expensive, and more effective to raise funds for the purposes of the act by levying predictable fees on natural gas and other fossil heating fuels.

The state could engage a yet-to-be-defined "default agent" that would be tasked with reducing fuel use in the homes of low-income and moderate-income residents to ensure those particular demographics account for 40% of all clean heat credits. But how does the introduction of clean heat credits make it easier to track where the benefits are going? But why not leverage existing programs – such as Clean Heat RI, and the efficiency programs run by the gas and electric utilities – that already tackle equity issues through things like OER's Residential Income-Eligible program, RIE's Discount Rate Program, and collaboration with DHS on LIHEAP and can track where state-sponsored subsidies and technical assistance are going and how much impact those efforts are having on customers' energy bills?

There are other problems with the plan as drafted.

- The definition of "obligated parties" does not seem sufficiently comprehensive. We presume that companies such as UGI Energy Services, ENGIE Resources, Inertia Resources, and Muirfield Energy who supply natural gas to commercial and industrial customers in Rhode Island would also be required to purchase clean heat credits in proportion to the volume of fuel they sell in or into the state.
- The market construct will
    - make it hard to predict the price of clean heat credits, thus making it hard for contractors to put together credible pro-forma analyses of what consumers might save through electrification, and hard for fuel suppliers and fuel customers to budget.
    - require owners of fuel supply and HVAC service companies to engage in a new financial market while coping with all the other challenges of running a business. And

CONCLUSIONS

We ask that the draft legislation be amended, removing any mention of clean heat credits and instead:

1. **Requiring the gas utility to increase the gas efficiency fee or to add a new electrification fee to customers' bills.** This is the approach put forward by Xcel Energy in Colorado in response to the mandates of that state's Clean Heat Standard.
2. **Authorizing the gas utility to use money collected through that increase or new fee to promote and subsidize the installation of heat pumps.** We suggest this could be done by discounting the price of electricity delivered to buildings using heat pumps in winter and/or by expanding the scale and scope of the utility's existing efficiency program.
3. **Imposing an equivalent electrification fee or excise tax on other fossil heating fuels sold in Rhode Island**. And, likewise, use that new revenue to incentivize energy efficiency measures and heat pumps installations not associated with a gas utility account. This could be done through the existing Clean Heat Rhode Island program at OER or through other programs that the state might conclude would be more efficient.
4. **Requiring, where a heat pump installation has benefited from a public or rate-payer subsidy, that the appliance be enrolled in an electricity demand management program**. This is important if we are to avoid increasing the cost of electricity as a result of building heat electrification.
5. **Encouraging building owners who install heat pumps to retain existing fossil-fueled furnaces and boilers for backup and load-shedding purposes**. This is important if Rhode Islanders are to stay warm during a local electrical outage and these assets will be extraordinarily valuable if we encounter extended periods of frigid weather and limited electricity generating capacity in the 2030s and later.