NAIOP
MARYLAND CHAPTERS
THE ASSOCIATION FOR COMMERCIAL REAL ESTATE

February 25, 2022

The Honorable Kumar P. Barve, Chair
House Environment and Transportation Committee
House Office Building, Room 251
6 Bladen St., Annapolis, MD 21401

Oppose: HB 831 – Reducing Greenhouse Gas Emissions - Commercial and Residential Buildings

Dear, Chair Barve and Committee Members:

The NAIOP Maryland Chapters represent 700 companies involved in development and ownership of commercial, mixed-use, and light industrial real estate, including some of the largest property owners in the state. NAIOP's membership is comprised of a mix of local firms and publicly traded real estate investment trusts that are invested in the future of Maryland but also have experience in national and international markets. On behalf of our member companies, I am writing in opposition to House Bill 831.

NAIOP's Commitment to the Greenhouse Gas Reduction Act

NAIOP supports adoption of reasonable strategies and responsible, technically sound regulations designed to reduce greenhouse gas emissions on schedules and using methods that minimize economic disruption and result in an orderly energy transition for building owners and occupants. We are concerned that HB 831 will result in an abrupt, unstructured, expensive and disruptive transition.

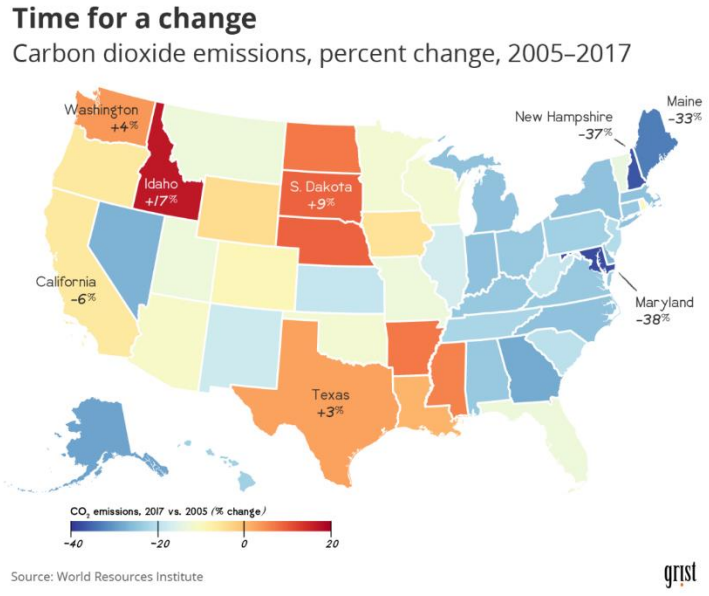
Success in climate mitigation fits the ambition and values of NAIOP's members. NAIOP supported adoption and reauthorization of the Greenhouse Gas Reduction Act. [GGRA] The GGRA ensures that Maryland's climate mitigation plans meet specific performance criteria that reduce greenhouse gas emissions but also generate economic benefits, maintain stable energy markets and present the public with least cost and practical compliance options.

Maryland's Progress to Date

Developing sets of practices that meet the intent of the GGRA principles can be challenging but it has produced strong results. In 2008 the state estimated that without action, emissions in Maryland would reach 128.3 million metric tons [MMT] by 2020. The GGRA 2030 Plan model results indicate emissions of ~67MMT in 2020.

A 2020 report from the World Resources Institute entitled, *"America's New Climate Economy"* ranked Maryland first out of 41 states that had both reduced emissions and grown their economies.

As climate mitigation gets harder it will be more important than ever that policymakers adhere to the performance characteristics called out by the GGRA. If political demands are allowed to bypass or lower the performance standards set by the GGRA, then our view



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Why Do Supporters of Climate Mitigation Oppose HB 381?

The bill mandates abrupt, unaffordable actions without the financial or policy support necessary to overcome barriers and meet the accelerated deadlines.

Cost-Effectiveness

1) **The state's climate consultant estimated the building costs** necessary to implement the *high electrification scenario* that is the basis for HB 831 **would be between $7.7 and $14 billion per year.** HB 381 imposes requirements without incentives fill funding gaps.
2) The HB 831 *High Electrification* scenario **costs 8 to 16 times more per ton of carbon mitigation than the 2030 GGRA Plan.** As explained below, **the state's climate consultant modeled other scenarios that were found to be less expensive and less risky.**
3) Even though the Maryland Commission on Climate Change recommended that any retrofit program should include ***"commercial tax credits and direct subsidy payments … large enough to reduce the simple payback period to between 3 and 7 years."***
4) Electrifying heat loads **will stress the electric grid triggering costly upgrades.** The cost and logistical complications of utility grid improvements and bringing expanded electric service capacity to commercial buildings are immense. Because the rate of return for public utilities is guaranteed, the **electric grid improvements will primarily be paid for by building owners and tenants.**
5) There will be **a subset of smaller residential and commercial buildings that can reasonably electrify.** But **for most larger commercial and multi-family buildings required changes will increase capital and operating costs resulting in long or non-existent payback periods** that exceed the life of the equipment.
6) **As customers are removed from the natural gas system, costs will sharply increase for remaining customers** because fewer participants will have to pay for operations, maintenance of the system.
7) Electrifying heat loads **will increase peak electricity loads,** triggering higher peak demand charges in commercial utility rates.
8) The bill's **cost effectiveness test** for new construction **monetizes speculative, future benefits that ignore current costs and will not be recognized in loan underwriting.**
9) **There is no grandfathering** for mature projects and existing buildings that made long-term investments in infrastructure and equipment resulting in stranded costs.
10) The bill's **deadlines do not allow time for** equipment **performance and price improvement** or the time for **equipment to be replaced at the end of its useful life.**

Technical Limitations of Using Electric Equipment All the Time in All Buildings

11) The **technical limitations of heat pumps** make them difficult to scale up to meet the space hearing needs of large buildings.

12) High volume **hot water heat pump technologies are not commercially available**, and electric resistance hot water heating is inefficient and disqualified by energy codes.

13) **Maryland industrial sites will be at a competitive disadvantage** because they will no longer meet common site selection criteria and there is no accommodation for natural gas for industrial buildings.

14) The bill requires all buildings to use **electric equipment for secondary heat and emergency power which is insecure and impractical.**

15) **The bill does not recognize the special circumstances of Combined Heat and Power** plants, industrial users, commercial kitchens, medical, life sciences, small incinerators, **or other special uses**.

16) **The exemption for historic buildings is narrowly applied** to registered properties and **does not include contributing structures within a historic district.**

The Compliance Deadlines

17) **The requirements for buildings to decarbonize are faster and deeper than recommended by the Maryland Commission on Climate Change**, the **World Green Building Council**, International Energy Administration, and the UN Intergovernmental Panel on Climate Change. [U.N. IPCC]

18) The rate of **private building carbon reductions is faster than the public utility requirements** to reduce energy use which is easier to accomplish. State law carefully protects utility rate of returns no protections for private building owners and occupants.

19) The existing buildings provisions of HB 381 include a state administered **carbon fee expected to be $100/ton of annual emissions beginning in 2030, ten years before the final deadline**. This is a parochial outdated approach that prevents access to established carbon trading markets.

20) Installation of solar, electric vehicle charging, and grid integration **equipment is mandated regardless of the suitability of the building** and **before the state has removed regulatory barriers** to meaningful use of solar on commercial buildings **or apportioned any of the costs to the other beneficiaries** - charging companies, utilities and automobile manufacturers.

21) Banning use of gas in buildings now, predates arrival of the 100% RPS / CARES report locking in a narrow pathway forward

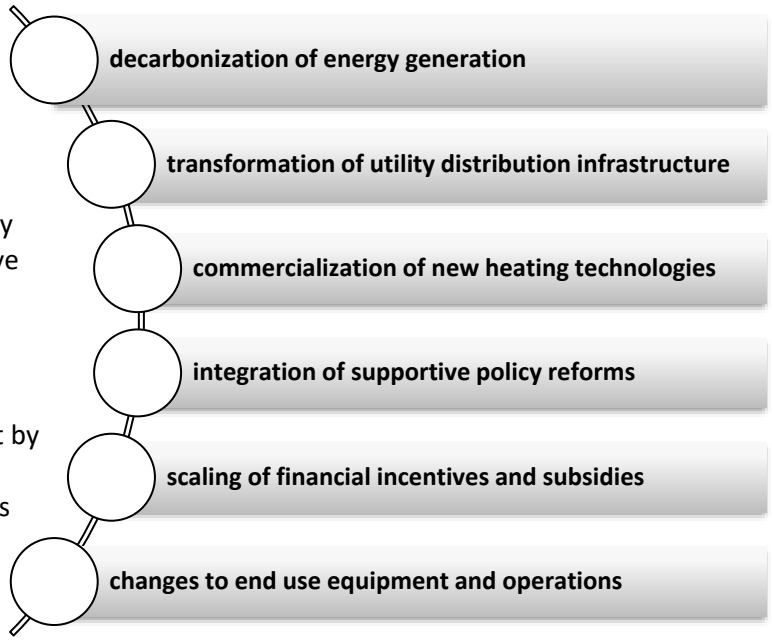
22) **Because the emissions standards for existing buildings apply to all greenhouse gases emissions,** secondary pollutants from HVAC refrigerants and **tenant activities** including those operating under state air quality permits **will have to be reduced to net-zero by 2040. The IPCC target for reducing secondary pollutants is after 2050.**

Supportive Policy Elements Are Not There

Building decarbonization depends on coordinated progress across six interrelated policy and market areas that start with renewable energy generation and end at building level changes to heat and hot water equipment. The bill mandates changes to end use equipment and operations but does not provide answers to these other unresolved, interrelated policy issues or financial assistance to overcome the negative economics of building decarbonization.

A general lack of readiness in these important policy areas prevents building owners from believing that building electrification on the abrupt pathway set out by the bill will result in positive economic and environmental outcomes. Without more of a systems approach to thinking about climate mitigation and a structured, orderly framework the possibility of transition risks and policy mistakes become much more likely.

Six Essential Elements of Building Decarbonization Policy



Electric Generation, Transmission and Distribution System Is Not Build to Accommodate

Today, 55% of the total energy consumed in Maryland buildings is supplied by natural gas, fuel oil and propane. The bill would require all those loads reach net zero by 2040 which would roughly double electric demand from buildings. The electric generation and distribution capacity was sized based on the knowledge that natural gas and other fuels would be serving a high percentage of energy load and not ready to meet HB 831.

About 30% of Maryland's power comes from out of state. The increase in loads from buildings pressures in-state and out of state supplies. Just last year the Pennsylvania Utility Commission denied approval to a high voltage transmission line because most of the benefits would be realized by Maryland electric customers.

Only about 9% of electricity consumed in Maryland is from renewable resources but it is required to reach 50% by 2040 - the same period that the bill requires that thermal loads from buildings are electrified. The connection of renewable generating capacity has fallen behind what is necessary to reach the renewable goals established by the states in the Northeast. The grid operator PJM recently declared a 2-year moratorium on applications to interconnect renewable power generating facilities.

The Wall Street Journal recently reported on the stressed electric grid, and the difficulties of balancing supply and demand on a grid increasingly served by renewable generating sources. The New York Independent System Operator recently warned of rolling blackout as soon as next summer.

Moving thermal loads from buildings to the electric grid under the timetable in the bill raises major concerns about reliability, energy price and the cost of bringing additional capacity to building sites. The costs of these upgrades will be charged by the utilities back to building owners and occupants.

More than 1.5 Billion Square Feet of Apartment and Commercial Space –

The scale of the work necessary to meet the mandate, and the inherent economic barriers to carbon emissions reductions in buildings make the building sector particularly challenging. The bill applies to more than 1.5 billion square feet of apartment and commercial space. 585 million are located in suburban Maryland counties. More than 818 million square feet are in the Baltimore area. Baltimore City has 250 million square feet. 78 million of that was built before 1960.

Buildings and Square Footage by Planning Region

Region	Buildings	Square Feet
Baltimore Metro	7,726	818,818,379
Lower Eastern Shore	510	47,701,744
Southern Maryland	467	36,512,649
Suburban Maryland	4,918	585,781,058
Upper Eastern Shore	486	47,820,051
Western Maryland	666	65,300,855
Total	**14,713**	**1,596,934,736**

Source: Costar

Baltimore City – Buildings by Year Constructed

Year	Buildings	Square Feet
1811-1919	329	26,106,206
1920-1939	241	20,730,190
1940-1959	290	32,740,828
1960-1989	631	79,809347
1990-2009	245	31,500,469
2010-2021	193	30,334,981
Unknown	150	20,417,923
Total	**2,079**	**250,752,904**

Source: Costar

Economic Barriers and the Importance of Incentives

While there will be some cost-effective opportunities to electrify heat and hot water in smaller buildings, for many commercial buildings, electrification will not provide a return on investment during the lifetime of the equipment.
A research report by the American Council for an Energy Efficient Economy evaluated electrification of space heating in existing commercial buildings. The charts below show the simple payback period for buildings replacing gas fired furnaces and boilers with a commercial heat pumps system. Only 27% of commercial floor area will achieve a simple payback period of 10 years or less. The percentage that payback at the building level can be increased to 60% with incentive payments. The data are nation-wide, and the report notes much better heat pump economics in parts of the country that have mild winters and for building types with modest heating demand.

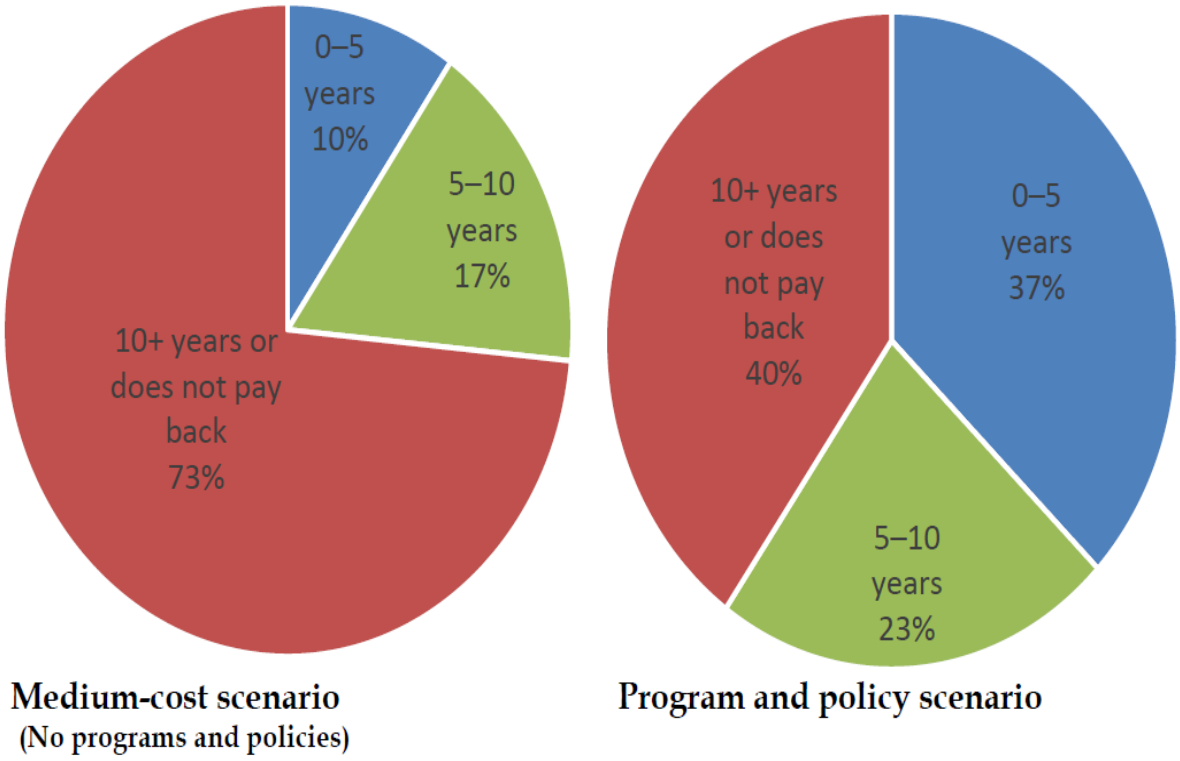


Figure ES-1. Distribution of the simple payback period by floor area for converting gas-fired rooftop systems, furnaces, space heaters, and small boilers to heat pumps when existing equipment needs to be replaced

Equipment Cost and Performance Barriers

For large commercial building types, heat pump and hot water heat pump technologies will not be cost competitive until price and performance improve. How quickly that happens will determine how quickly commercial buildings may be able to electrify.

The line graphs below were produced by MDE's climate consultant as part of analysis of the building energy transition plan. The consultant's reporting is based on assumptions that the cost of heat pump technologies will decrease 37% by 2050. Even with that optimistic level of improvement, the commercial heat pumps and heat pump water heaters [blue lines] are still more expensive to install in 2050 than other types of equipment.

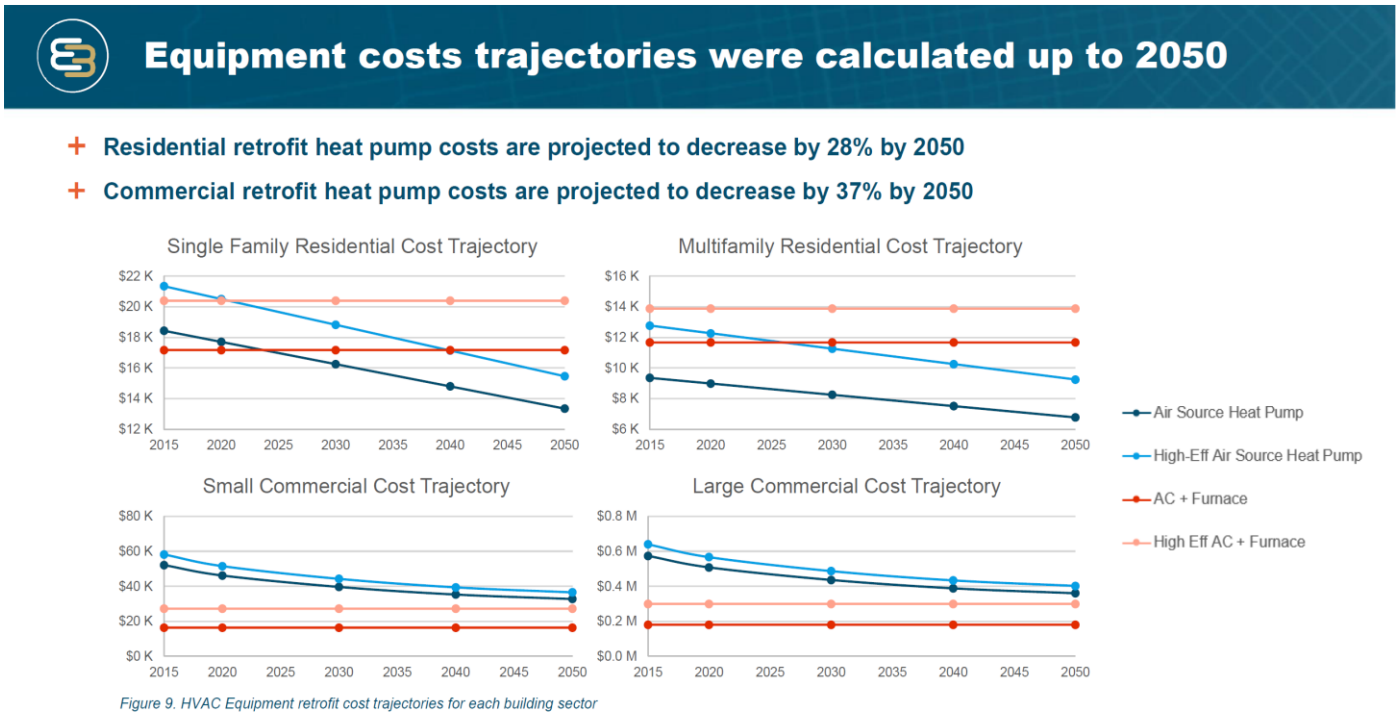
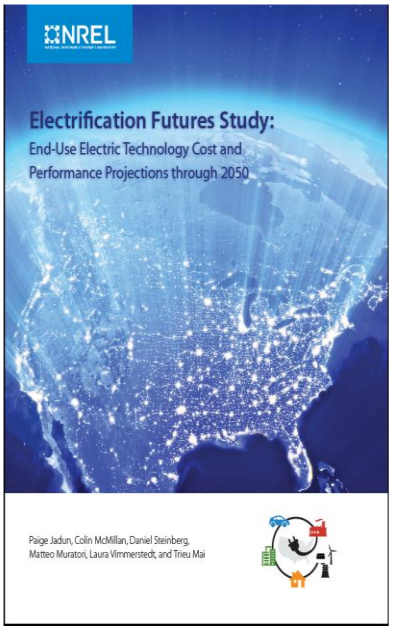


Figure 9. HVAC Equipment retrofit cost trajectories for each building sector



National Renewable Energy Laboratory [NREL] – *Electrification Futures Study: End-Use Electric Technology Cost and Performance Projections through 2050* – Evaluates the levelized costs and forecast the rate of advancement in the price and performance of technologies important to building electrification.

Key takeaways from the report related to the feasibility of electrifying commercial buildings:

"In the commercial sector heat pump technologies for space heating applications in warm or moderate climates can become cost competitive by the end of 2040."

"In contrast commercial ccASHP (cold climate Air Source Heat Pumps) require substantial improvements to achieve cost parity with incumbent gas technologies, but with advancement…. could do so over the next two decades."

The report goes on to say that for a cost driven shift in adoption to take place, from gas fired *water heaters* to commercial *heat pump water heaters*, cost and performance would have to improve by 50%.

We relay this information to guard against the tendency to conflate the ability of some buildings to effectively electrify with the ability of **all** buildings to electrify. For many suitable equipment is not commercially available.

Heat pump technologies do not scale up well for deployment in large commercial buildings and will not be cost-effective for most commercial uses until technical performance improves, and costs decline.

There is a need for more rapid advancement in the performance and availability of refrigerants with lower global warming potential

The emphasis on energy efficiency and reducing peak energy demand through building code provisions means the energy models do not allow the use of electric resistance heat or hot water. For large apartment and commercial buildings there are no heat pump hot water systems.

Under an all-electric scenario large commercial building will use inefficient electric resistance equipment which will increase peak energy demand and electricity costs in ways not contemplated by MDE's scenario planning for building electrification.

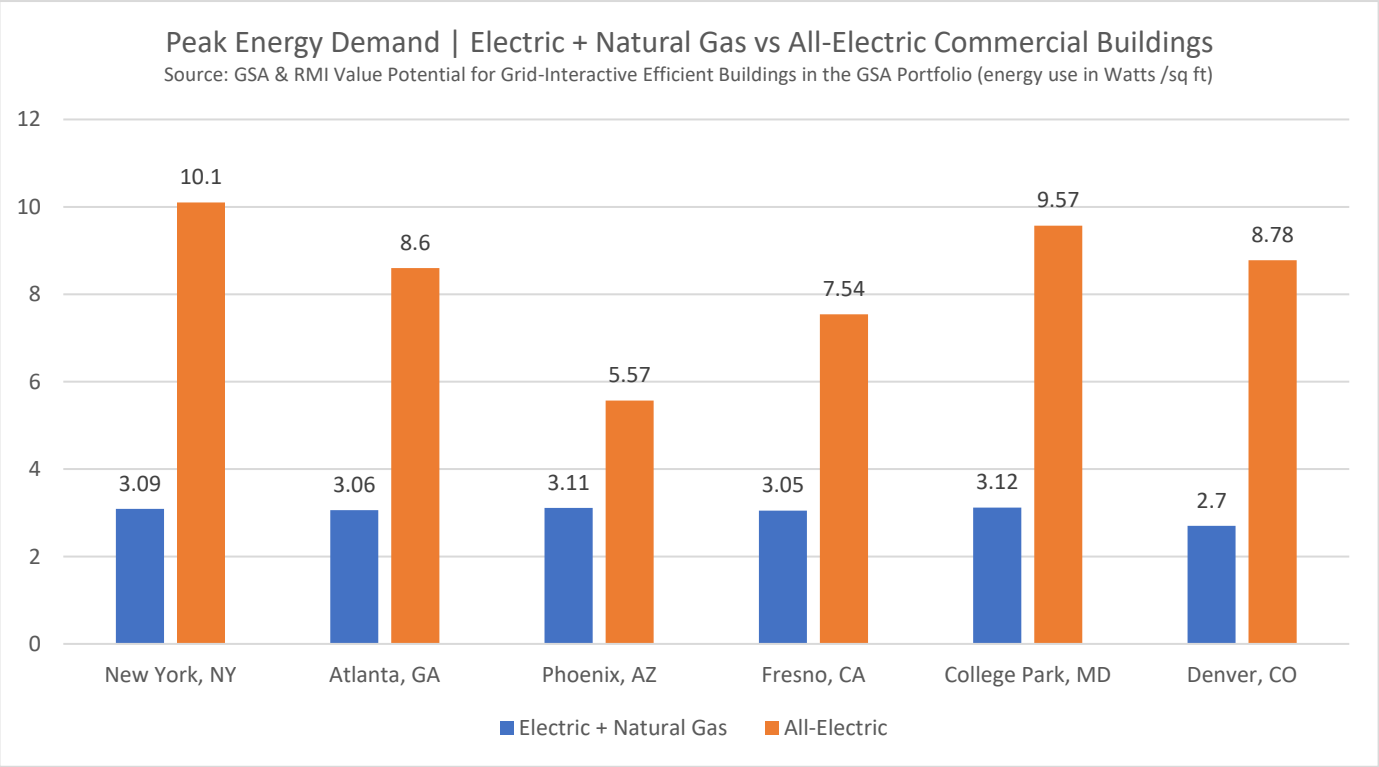
Cost Benefit Test Does Not Follow Accepted Methodologies

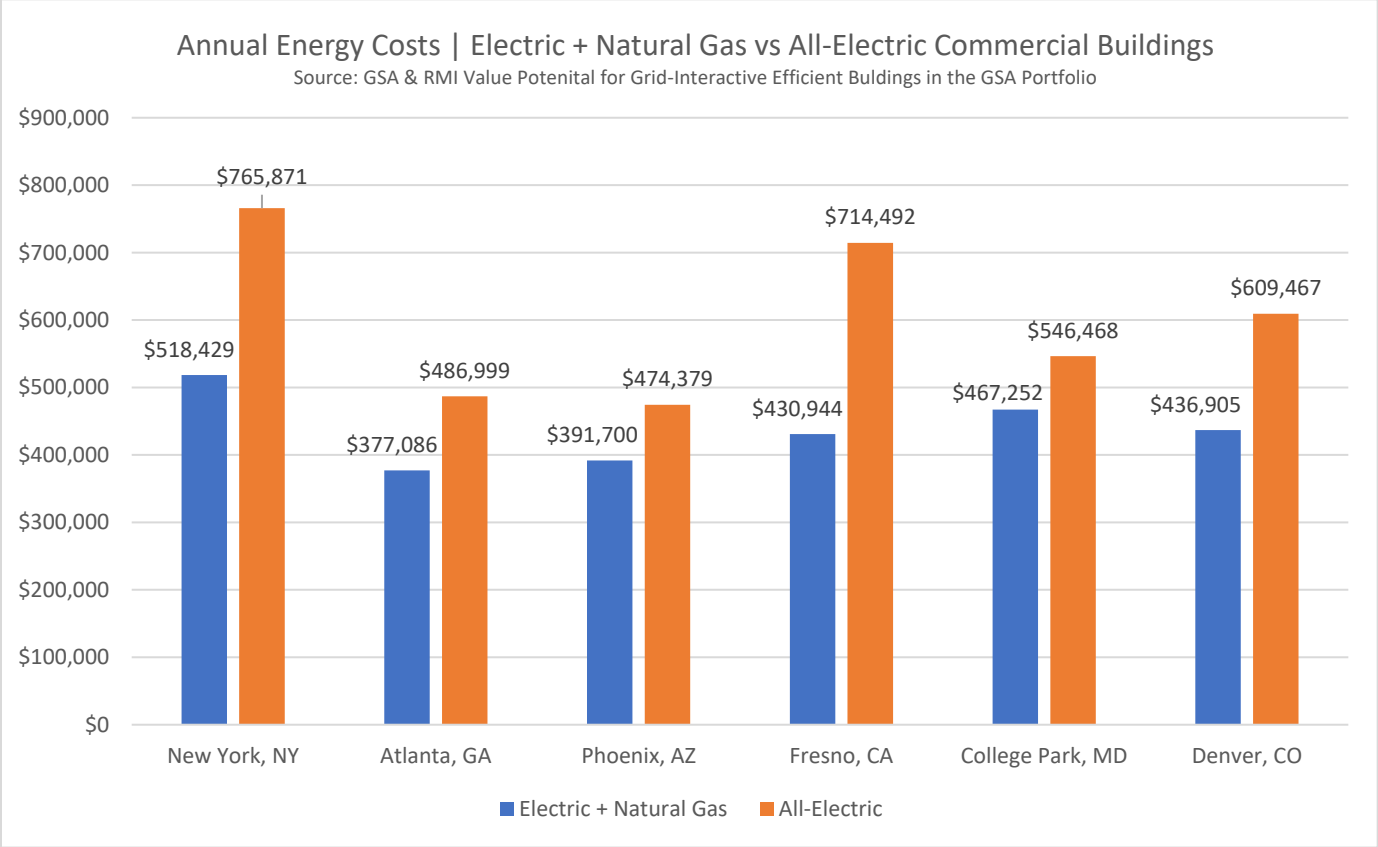
The bill allows for a variance to be granted but the cost-effectiveness test changes the logic used by US EPA's Energy Star Portfolio Manager and the Department of Energy to evaluate building codes and energy performance.

The method in the bill compares the incremental construction cost of full electrification to the to the social costs of carbon emissions that would be generated by the building. [p. 35, line 10] The calculation also requires use of idealized future assumptions about equipment costs, utility emissions rates, energy prices and utility distribution charges used by the Department of Environment in modeling mitigation scenarios. [p.35, line 23]

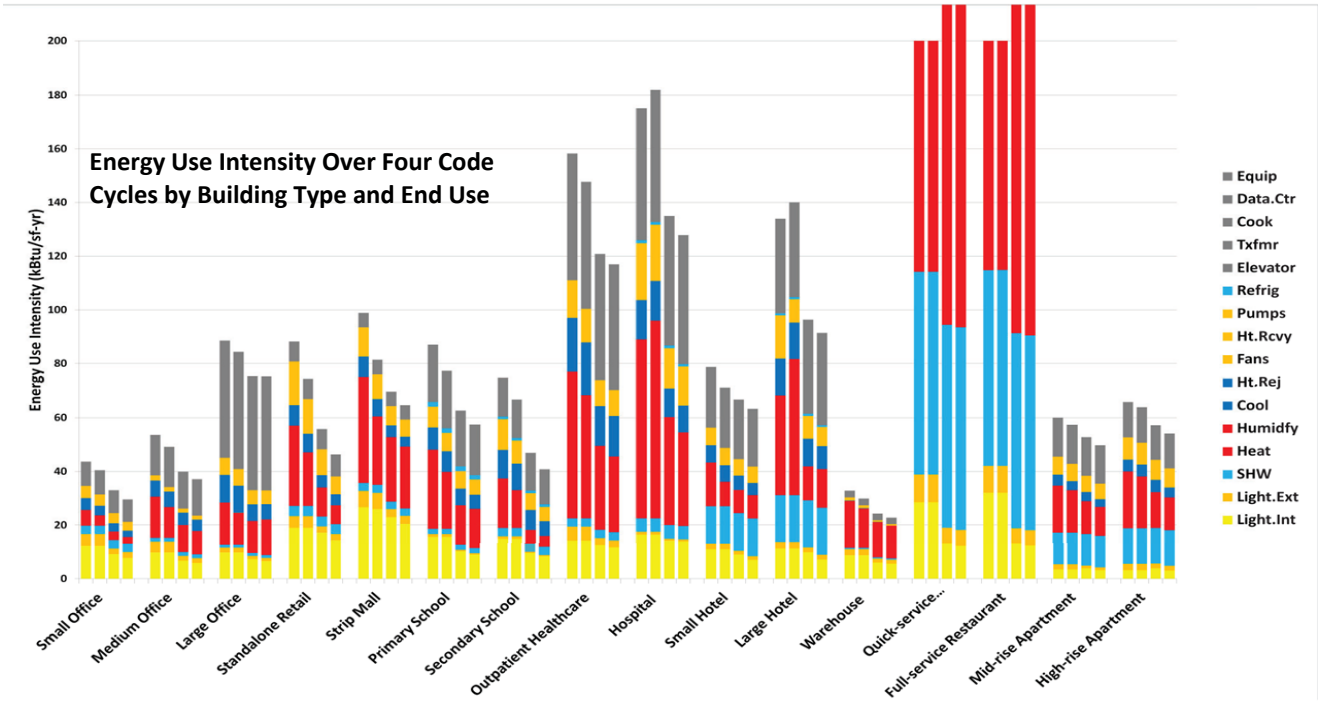
These societal benefits that cannot be monetized at the building level and will not be considered by banks and investors in financing decisions. The design changes they trigger will increase the construction cost of the building with little or no return on that investment.

Peak Energy Loads and Total Energy Costs Increase with Electrification





The Level of Difficulty Will Vary by Building Type



For decades, the commercial real estate industry in Maryland has been committed to energy efficiency, conservation, and high-performance construction. This experience leads NAIOP to consider deep reductions

in carbon emissions from buildings to be the most challenging of the sectors. In the bar graph above most of the red bars will be fossil fuel heat.

Electrification and decarbonization will be technically and economically challenging for many building types. Feasibility is particularly challenging for large commercial buildings that have energy intensive occupants – restaurants, education, hotels, medical providers and 24/7 365 operations. the red bars are heating loads that would be primarily fueled by natural gas. Deep reductions will be technically and economically challenging for many building types.

The World Green Building Council and other thought leaders say industry-wide decarbonization needs to happen by 2050. Decarbonizing the commercial building stock on a 2050 timeframe with goal of 2045 if it is feasible would be a challenge even under optimistic scenarios for technology advancement, renewable energy deploymentand and with favorable economic conditions. Requiring 40% of commercial building emissions to be abated by 2035 is unreasonable and it is not realistic to apply an industry-wide net zero 2040 mandate on the building sector.

Maryland Should not Decouple from the International Building and Energy Codes

NAIOP is has major concerns that decoupling from the building codes will force the use of unproven technologies and costly, untested code provisions.

Building codes and technical standards are carefully developed to balance building performance and cost through a process that has the capacity and expertise to ensure the standards and requirements are technically feasible, commercially available and cost effective for builders and occupants.

The International Code Council [ICC] writes the building and energy codes adopted by Maryland and most other states. The ICC is following a standards-based approach to development of low carbon and near zero carbon construction. Those products will provide a technically sound and managed code transition. Maryland should support that policy transition instead of adopting an arbitrary, calendar-based prohibition on fuel use. The state should wait for this work product to be finished rather than decoupling.

NAIOP believes success will be more likely through a technology and fuel neutral approach that resists component-based, piecemeal mandates and fuel bans. A holistic approach recognizes that buildings are complex, integrated systems that can provide multiple pathways to achieve performance objectives provided design teams have the freedom to make trade-offs and take advantage of synergistic opportunities. A fuel and technology neutral approach is taken by the ICC building and energy codes, International Green Construction Code, as well as EPA Energy Star, LEED, and other voluntary high-performance building certification programs.

A mixed fuel and technology neutral approach was modeled by MDE's climate consultant over the interim and showed the *"lowest overall cost while also reducing reliance on technologies that have not been widely commercialized."* [Please see details below]

Whether electrification of large commercial buildings increases or decreases carbon emissions is dependent on the carbon intensity of utility generated electricity provided during peak heating periods. Peak heating demand occurs during early morning hours of the winter when renewable electricity generation and heat pump performance are both weak.

Under the definition secondary and back-up power generation are not permitted to be served by fossil fuels.

There are no provisions for grandfathering mature projects already designed for fossil fuel equipment construction in developments that have already installed gas infrastructure.

The bill provides various provisions that require state entities to comply only if they receive compensation for the incremental costs or allow requirements to be waived based on the suitability of equipment, site constraints, or the building use. Private buildings do not get this kind of consideration.

Building Energy Transition to Net Zero - Conceptual Framework

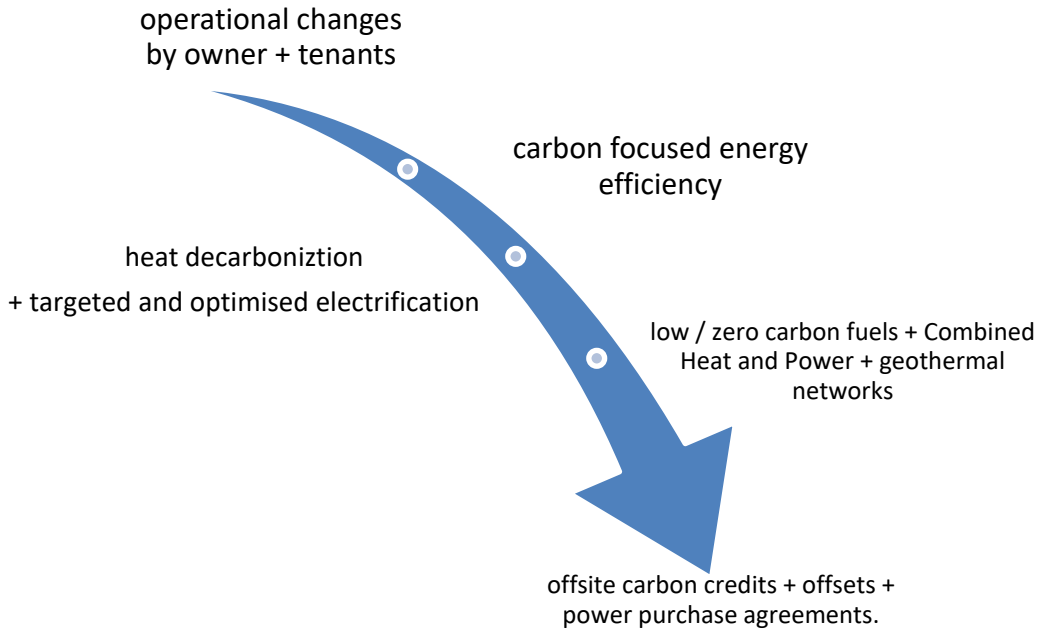
The tools many building owners plan to use for energy transition are not available in the narrow framework of SB 528. Co-generation and Combined Heat and Power plants that serve downtown Baltimore, institutions and hospitals are ignored by the bill. These technologies are usually considered strategic pieces of a energy plan for clusters of large buildings.

The bill does not target electrification to cases where it is beneficial at the consumer level. The almost immediate draw down of natural gas customers will weaken the system and reduce the chances that the infrastructure can be used to transport low and the no carbon fuels in the future.

It sets performance mandates and penalties but does not provide financial support to overcome the negative economics of electrifying large commercial buildings and apartments.

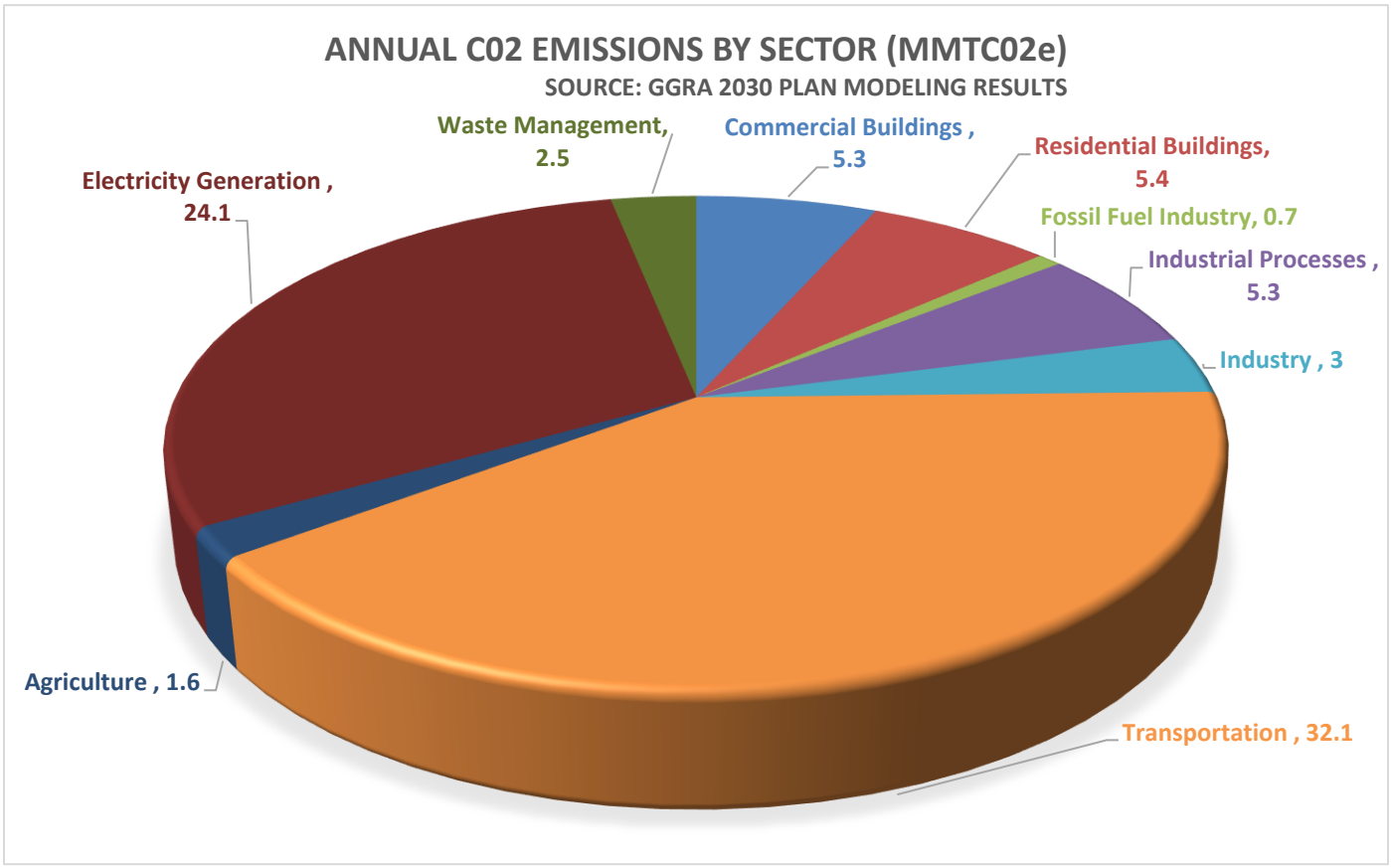
The deadlines in the bill do not provide time to address persistent issues related to the readiness of the utility grid, time for heating equipment in buildings to turnover at the end of its natural life, or for advancement in heat pump technologies. All of these things will increase the cost and difficulty of an energy transition in buildings.

The bill hastily decouples from the International Code Council [ICC] building and energy codes rather than allow ICC to complete development of its low carbon and zero carbon code pathways which would provide a technically sound and managed transition.



Perspective on the Amount of Building Emissions in Maryland

Emissions from commercial buildings are 5.3 million metric tons representing 7% of Maryland's economy-wide emissions total of 80 million metric tons. Emissions from natural gas use in commercial buildings are about 4MMT per year representing 5% of emissions.

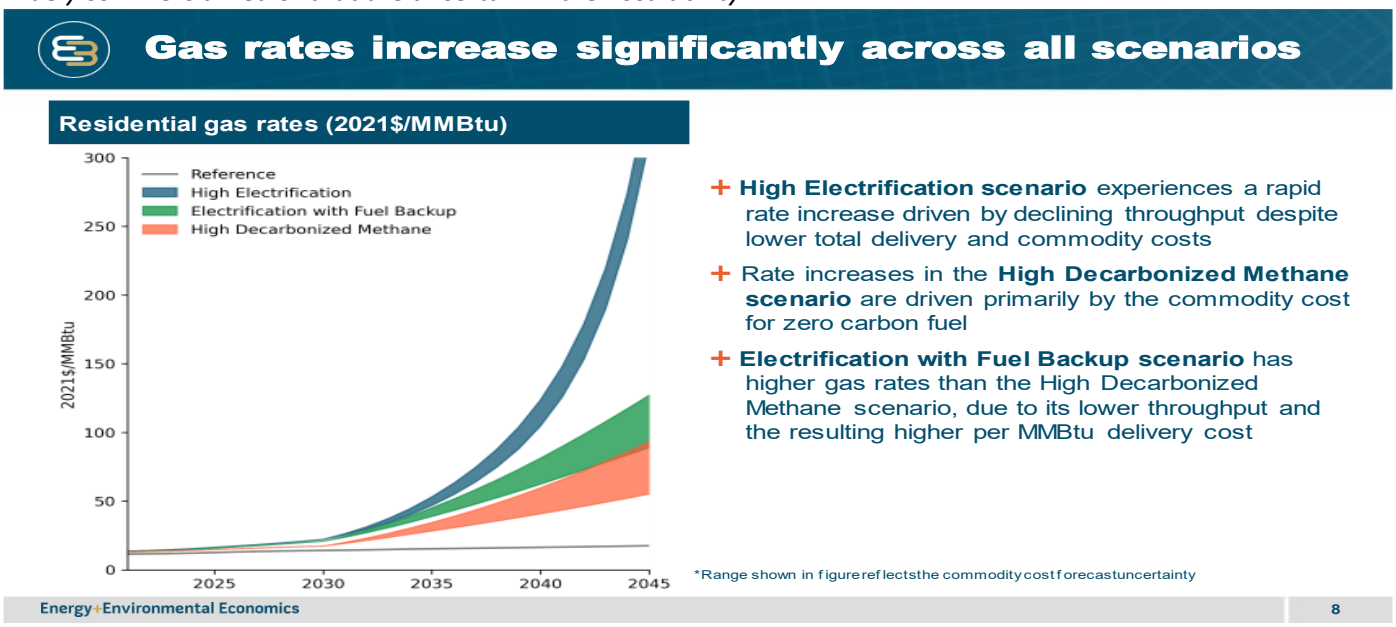


A Less Costly, Less Risky Energy Pathway to Net Zero than HB 831

During the 2021 interim MDE's climate consultant E3 [Energy and Environmental Economics] Modeled three scenarios that achieved net zero emissions in the building sector by 2025.

The High Electrification Scenario that is the basis for SB 528 was estimated to cost $7.7b to $14b per year. The costs were driven by the need for expanded electric generation and distribution as well as capital costs to replace heat and hot water systems as well as insulating buildings.

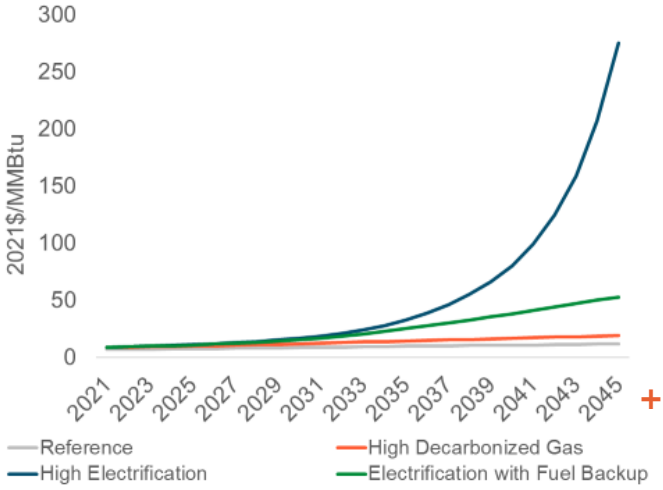
An alternative approach, the Electrification with Fuel Backup pathway scored better. The consultant concluded that the pathway, *"shows lowest overall costs while also reducing reliance on technologies that have not yet been widely commercialized or that are uncertain in their scalability."*



While gas rates increase in all scenarios, the departure of customers in the high electrification scenario creates a rapid rise in prices and distribution costs after 2030. This is a major concern for our members who may remain on the gas system until later in the transition period.

Delivery costs of gas increase dramatically as more and more households electrify

Residential gas delivery costs (2021$/MMBtu)



+ **High Electrification scenario experiences a rapid increase in per unit delivery costs after 2025 due to the reduced gas throughput, regardless of the fact that total delivery cost is lower than in other scenarios**
  - High Electrification scenario assumes earning on rate base, depreciation, and O&M growth rates halved after 2025 leading to a 25% decline in total delivery costs by 2045.
  - As gas throughput and peak gas demand declines in the High Electrification scenario, reinvestment and maintenance for the gas system are expected to scale down.
+ **Reference, High Decarbonized Gas, and Electrification with Fuel Backup scenarios assume the historical earning on rate base growth rate is halved beginning 2035 assuming STRIDE is completed.**

Sources & assumptions current Revenue Requirement (RR) is estimated using Maryland specific delivery prices per sector from EIA. Rate base increases are based on historical averages and flat capital expenditures (see Appendix). Scenarios assume a "Business as Usual" allocation of Revenue Requirement to customer groups. Cost allocations might shift as the ratio of consumption changes.

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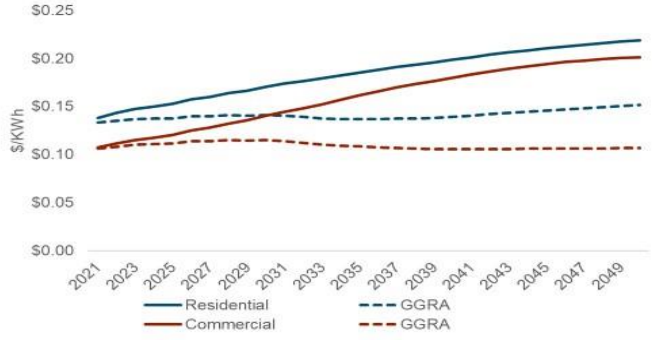
Electric rates increase more in the High Electrification scenario because of the need to build our more generating capacity and distribution. The peak demand moves from the summer to winter because of the electrifying space heating.

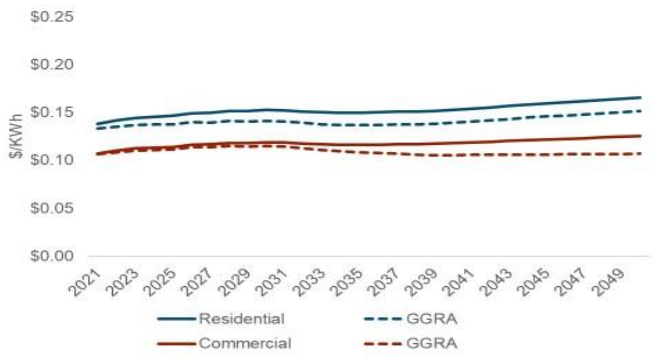
High Electrification scenario shows a more rapid electric rate increase compared to Electrification with Gas Back Up

+ **The Electrification + Gas Back-up scenario is projected to have a lower rate increase because it has a smaller load factor and manages to avoid the expensive peak capacity investment.**

Electricrates in the High Electrification Scenario (2021$/kWh)



Electricrates in the Electrification+ Gas Back-up Scenario (2021$/kWh)



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For these reasons NAIOP respectfully requests your unfavorable report on HB 831.

Sincerely.

Tom Ballentine, Vice President for Policy
NAIOP Maryland Chapters -*The Association for Commercial Real Estate*

cc: House Environment and Transportation Committee
Nick Manis – Manis, Canning Assoc.