Clean Heat Rules

Clean Heat Standard
&
Zero-Emission Heating Equipment Standard

AQCAC
September 16, 2024

Maryland
Department of the Environment

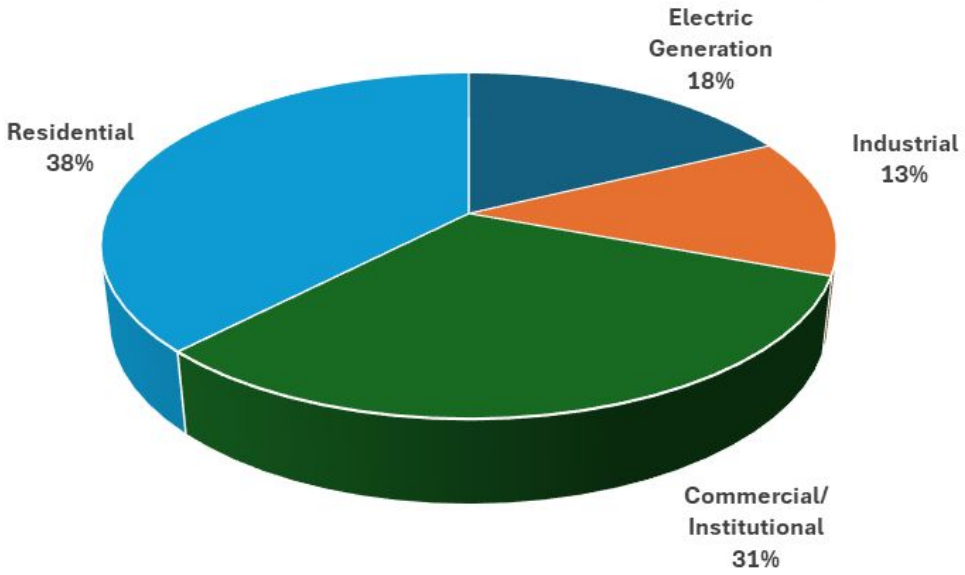
The Issue

Burning fuel in buildings produces air pollution that is harmful to human health and contributes to climate change

Maryland
Department of
the Environment

Fuel-burning equipment in buildings produce over <u>three times</u> more nitrogen oxide (NOx) emissions than power plants

Maryland's NOx Emissions from Stationary Sources (2020)



Approximately 70% of NOx emissions in Maryland are from vehicles and 30% are from stationary sources including buildings

NOx and other forms of air pollution from fuel-burning equipment harms children and adults in many ways

Respiratory

Wheezing and coughing

Shortness of breath

Asthma attacks

Worsening COPD

Lung cancer

Other

Premature death

Susceptibility to infections

Heart attacks and strokes

Impaired cognitive functioning

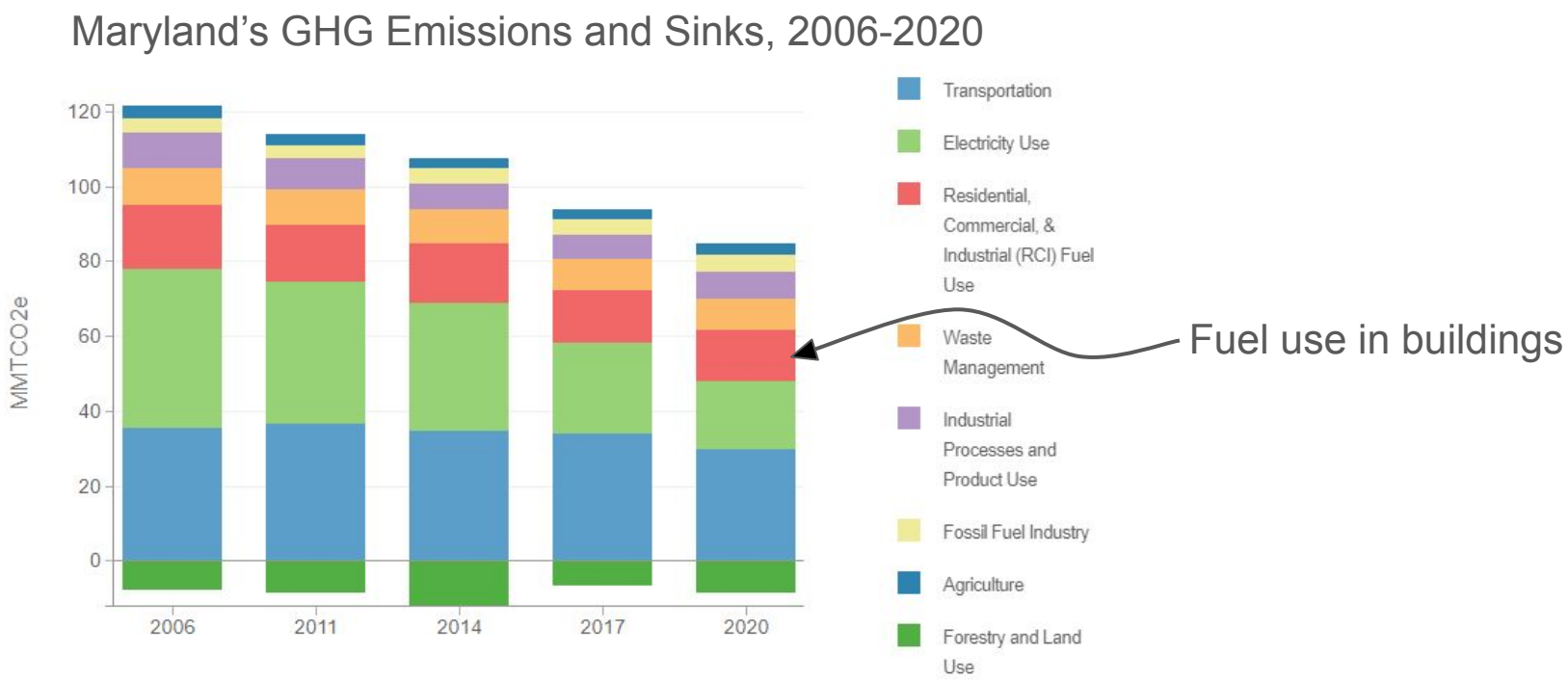
Metabolic disorders

Preterm births and low birth weight

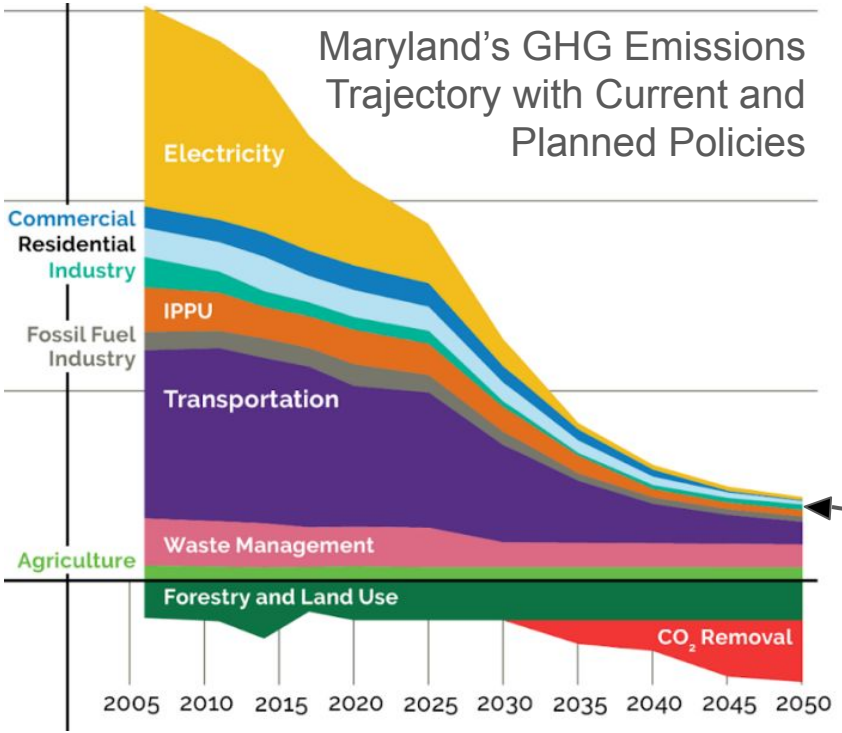
Source: https://www.lung.org/research/sota/health-risks

Maryland is required to reduce criteria pollutants to meet increasingly stringent air quality standards and protect the public's health

Fuel-burning equipment in buildings is responsible for around 16% of Maryland's greenhouse gas (GHG) emissions



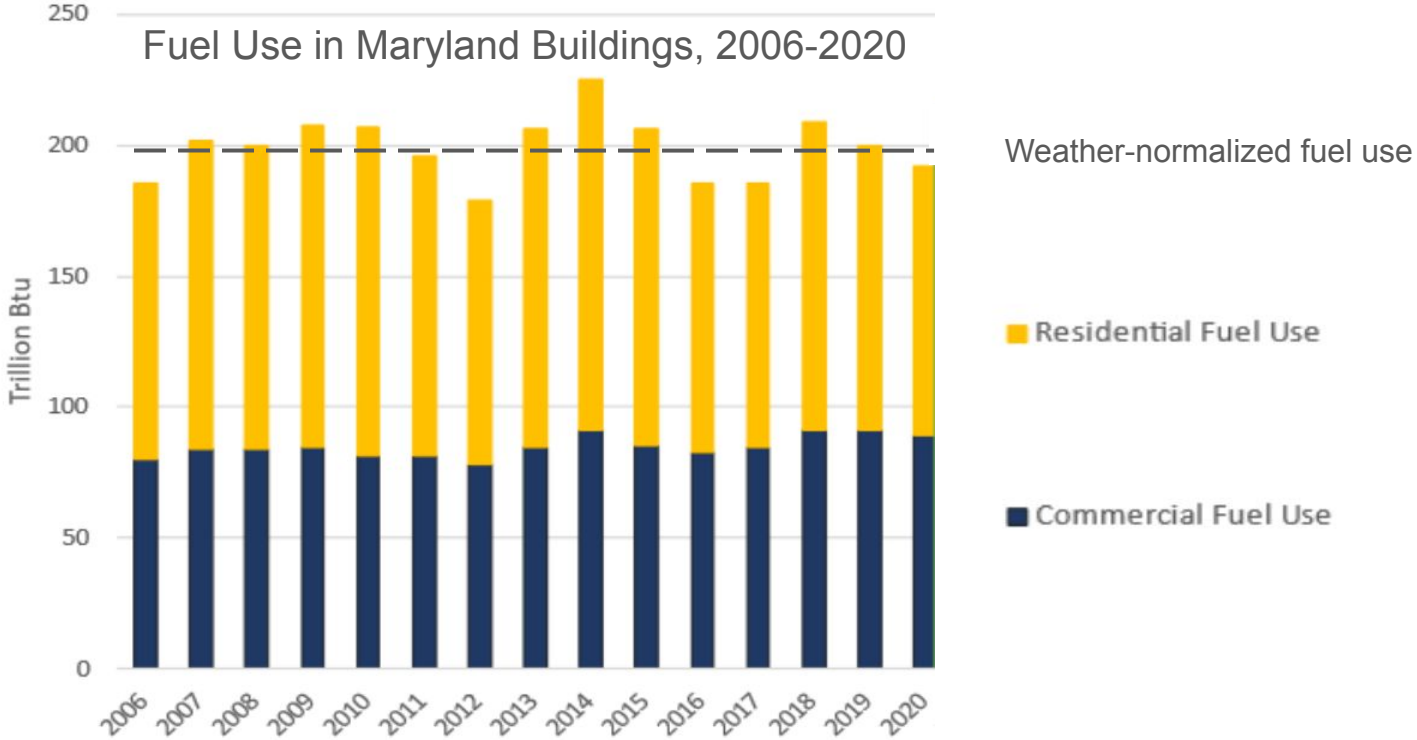
Reducing fuel use in buildings is a critical part of Maryland's plan to achieve its GHG emissions reduction requirements



Fuel use in buildings

Maryland is required to reduce GHG emissions 60% from 2006 levels by 2031 and achieve net-zero GHG emissions by 2045

Unfortunately, current policies have not so far reduced total fuel use in Maryland's building sector



The Solution

Ultra low-NOx and zero-emission heating equipment reduce or eliminate direct emissions and provide low energy costs

Zero-emission equipment like electric water heaters and heat pumps are already the best selling heating systems in Maryland

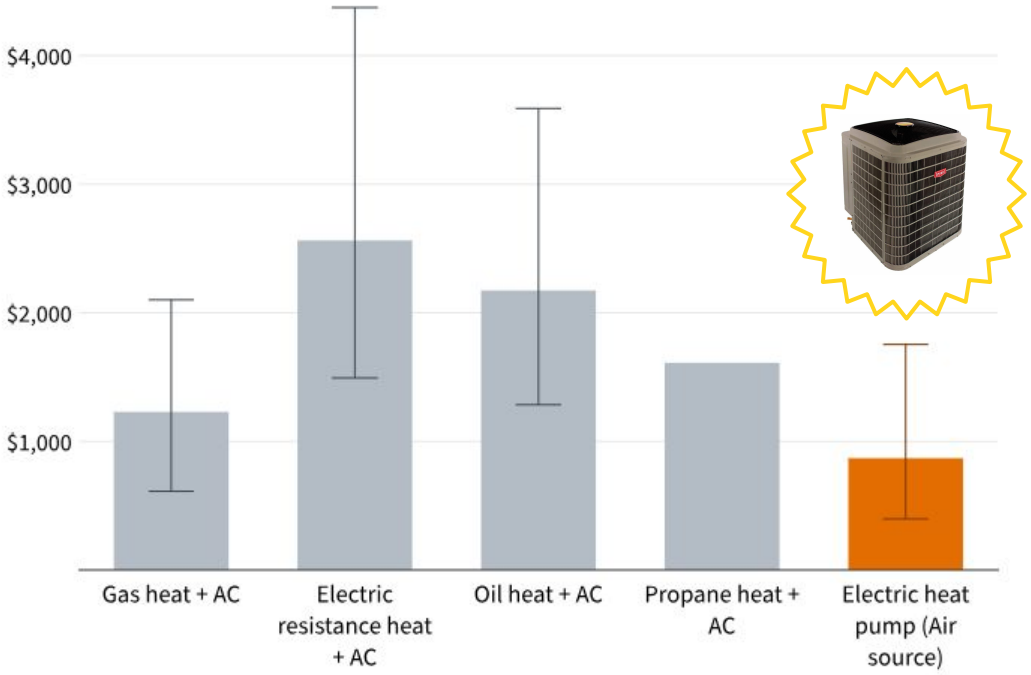
Electric/Heat Pump Water Heater

Heat Pumps for Heating and Cooling

Benefits of Heat Pumps

- **One device for heating and cooling** - A heat pump (HP) serves as both an air conditioner (AC) and a heating system, eliminating the cost of buying and maintaining separate systems
- **More efficient than AC** - HPs reduce cooling costs by around 18%
- **More efficient than other heaters** - Savings can be greater than $1,000 per year
- **No gas explosion risk** - Marylanders have died in recent years from explosions caused by gas leaks inside of buildings. Electric heating equipment can eliminate the need for gas service.
- **Improved air quality** - Zero emissions from direct combustion inside or outside the building
- **Improved occupant comfort** - HPs provide excellent temperature and humidity control
- **Federally subsidized** - The federal government is providing a 30% tax credit on heat pumps, rebates for limited-income households, and millions of dollars for heat pump manufacturing

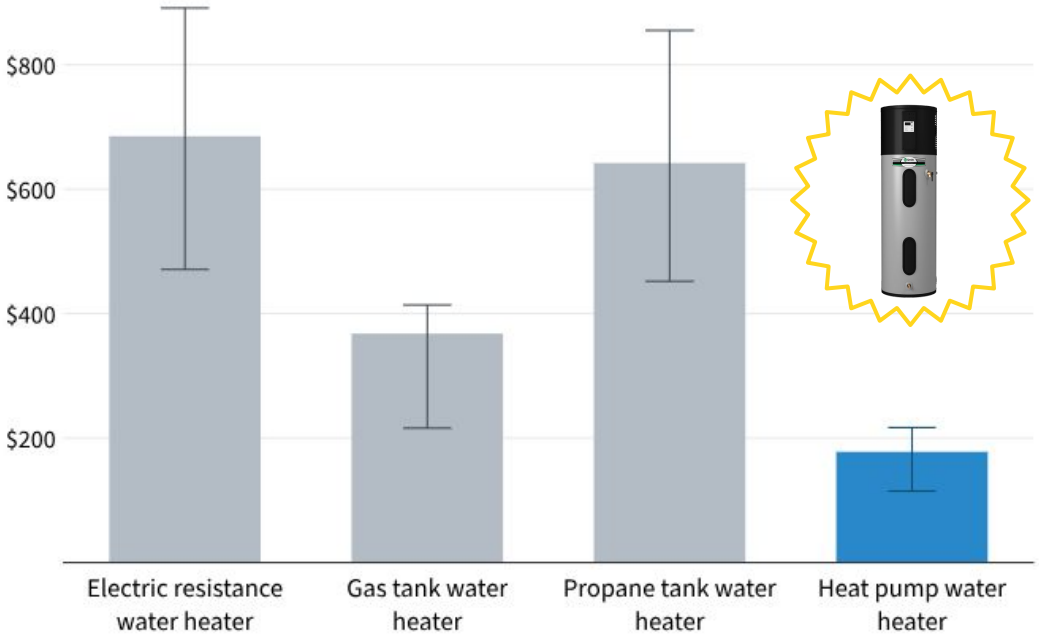
Heat pumps provide lower heating and cooling costs than other heating/cooling systems



Marylanders who use a heat pump for space heating and cooling **save $705 per year on average**, ranging from $360 compared with gas customers to $1,670 compared with electric resistance customers

Source: https://rmi.org/heat-pumps-can-lower-energy-bills-in-maryland-today/

Heat pumps water heaters cost less to operate than other water heating systems



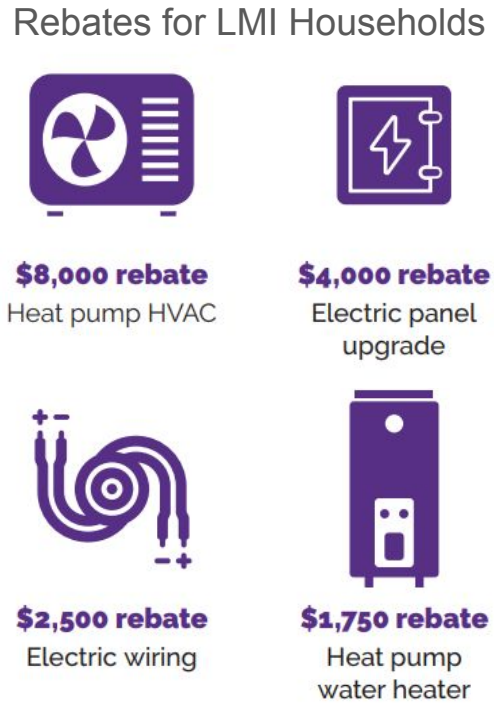
Marylanders who use a heat pump water heater **save $350 per year on average**, ranging from $150 for gas customers to $510 for electric resistance customers.

Upgrading to a heat pump water heater **pays back within 2 years** for the majority of Maryland homes.

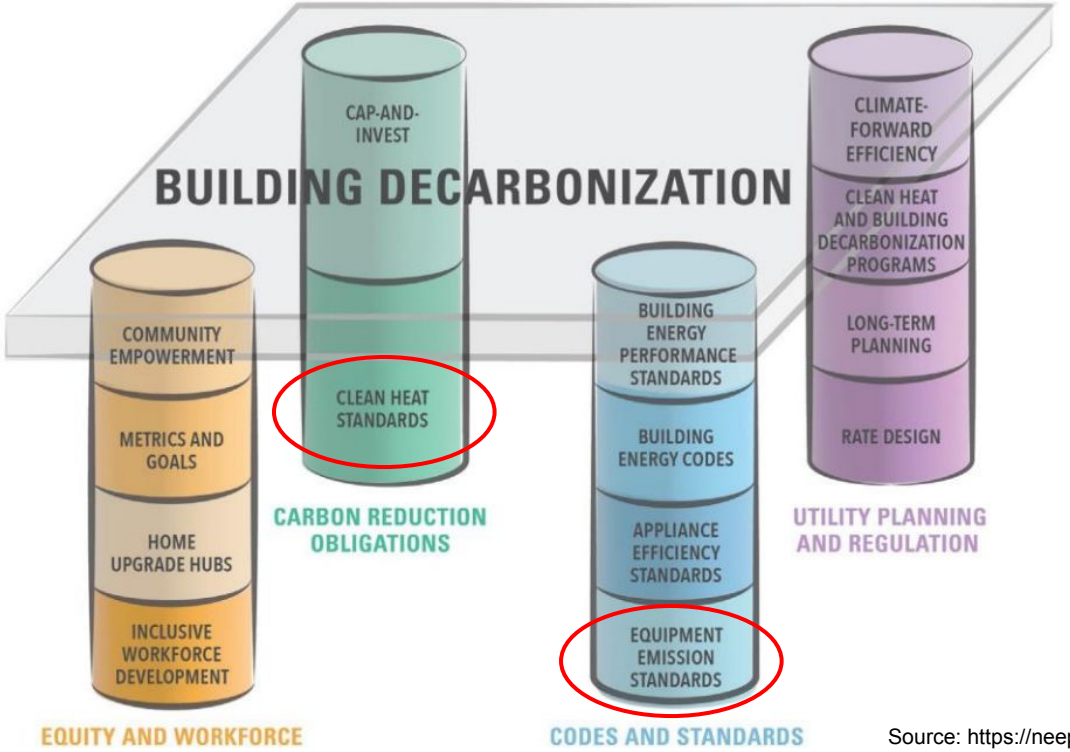
Source: https://rmi.org/heat-pumps-can-lower-energy-bills-in-maryland-today/

Federal, State, and EmPOWER incentives reduce the upfront cost of replacing fuel-burning equipment with heat pumps

- Federal
  - **30% tax credit** up to $2,000 for all consumers
  - Up to **$14,000 in electrification rebates** for low-, moderate-, and middle-income (LMI) households
- State
  - Up to **100% of the cost** for low-income households
  - **0% financing** for 24 months
- EmPOWER
  - **$1,600 rebate** on a heat pump water heater (example offering from Pepco)



Complementary policies can accelerate the adoption of zero-emission technologies and reduce building sector emissions



Source: https://neep.org/setting-table-building-decarbonization

The Zero-Emission Heating Equipment Standard (ZEHES) and Clean Heat Standard (CHS) address critical policy gaps

- Clean power policies reduce emissions from the electricity supply but do not reduce direct emissions from buildings
- EmPOWER reduces direct and indirect emissions from buildings but not fast enough to meet the state's climate goals
- Building Energy Performance Standards (BEPS) only apply to large buildings responsible for around 10% of residential and commercial building emissions
- No existing policy focuses on small fuel-burning equipment, as ZEHES will do
- No existing policy requires emissions to reduce fast enough to achieve the state's climate goals, as CHS will do
- CHS provides additional incentives to help people achieve BEPS and ZEHES

Governor Moore issued Executive Order 01.01.2024.19 requiring MDE to propose ZEHES and CHS

The Maryland Department of the Environment shall:

a. Propose a zero-emission heating equipment standard regulation that will phase-in zero-emissions standards for heating equipment to reduce carbon pollution and improve air quality inside homes and the ambient air;

b. Propose a clean heat standard regulation to expand Maryland's Renewable Portfolio Standard to the thermal energy system, mobilizing investment in clean heat solutions for homes and businesses

Zero-Emission Heating Equipment Standard (ZEHES)

Establishing NOx and GHG limits for space heating and water heating equipment

Maryland
Department of the Environment

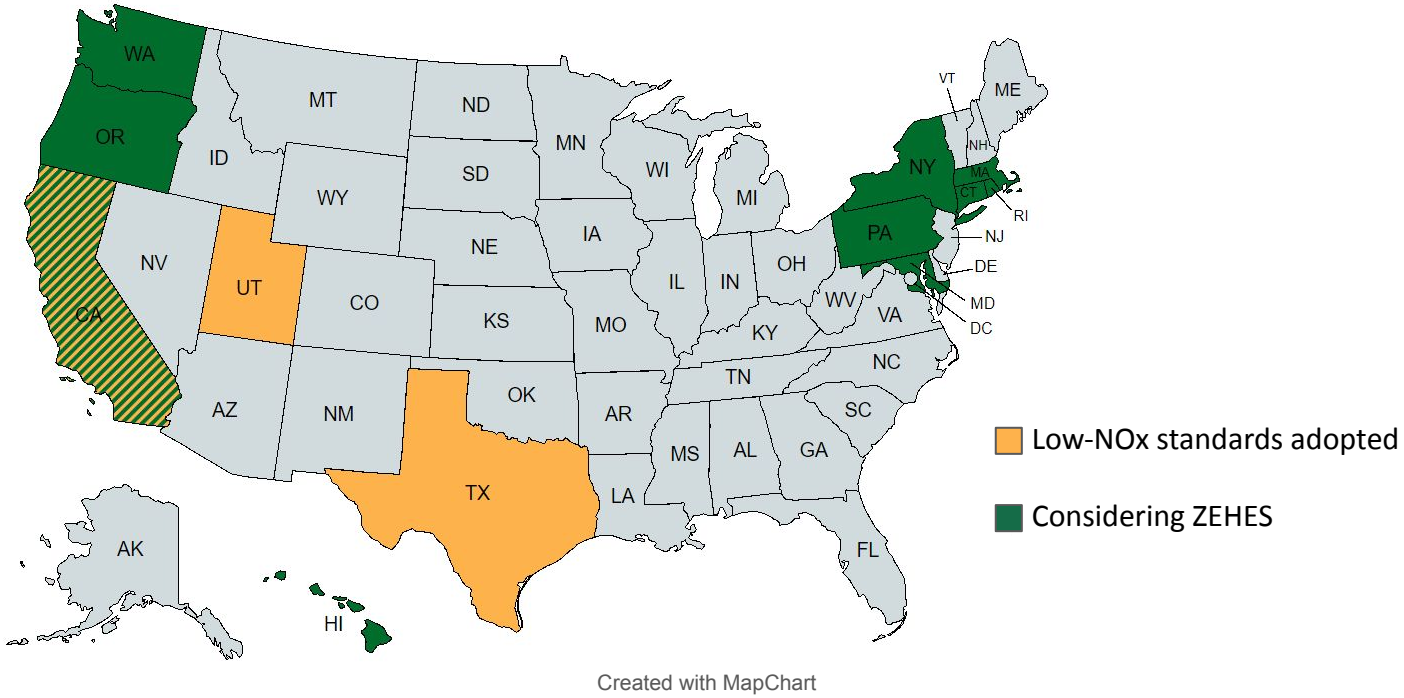
Similar to emission standards for cars and trucks, ZEHES sets emission standards for furnaces, boilers, and water heaters

Furnace

Boiler

Water Heater

Three states have adopted low-NOx standards for water heaters and at least ten states are considering ZEHES



California agencies are pursuing zero-emission standards for water heaters and furnaces

Bay Area Air Quality Management District (BAAQMD) adopted the nation's first zero-emission standards for water heaters and furnaces in 2023

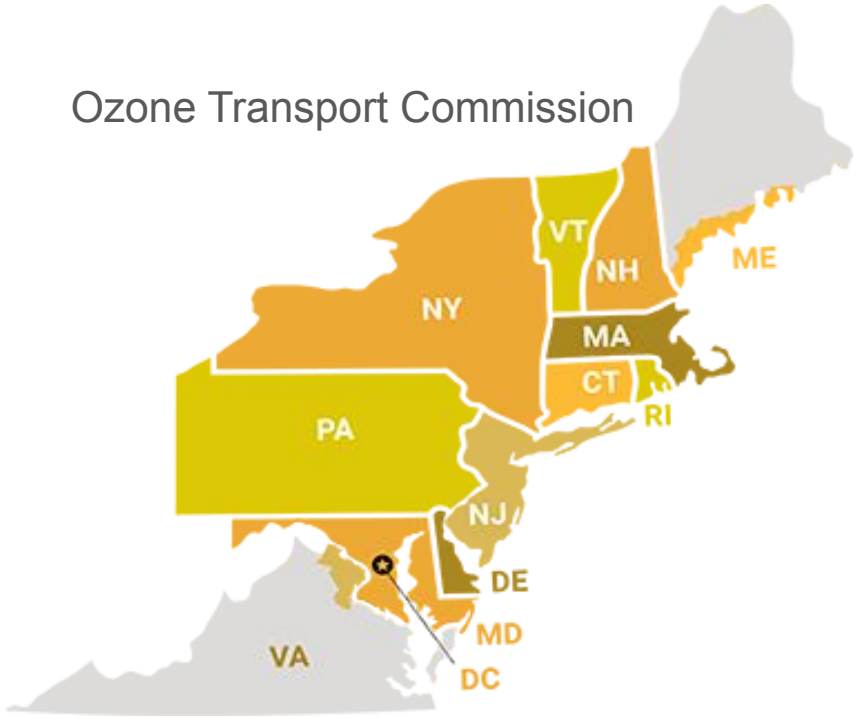
South Coast Air Quality Management District (SCAQMD) adopted zero-emission standards for commercial water heaters in June 2024, with other equipment types to follow

California Air Resources Board (CARB) committed to implement zero-emission standards by 2030 and is currently developing regulations for water heaters and furnaces

NESCAUM is developing a ZEHES Model Rule with input from state air regulators and heating equipment manufacturers

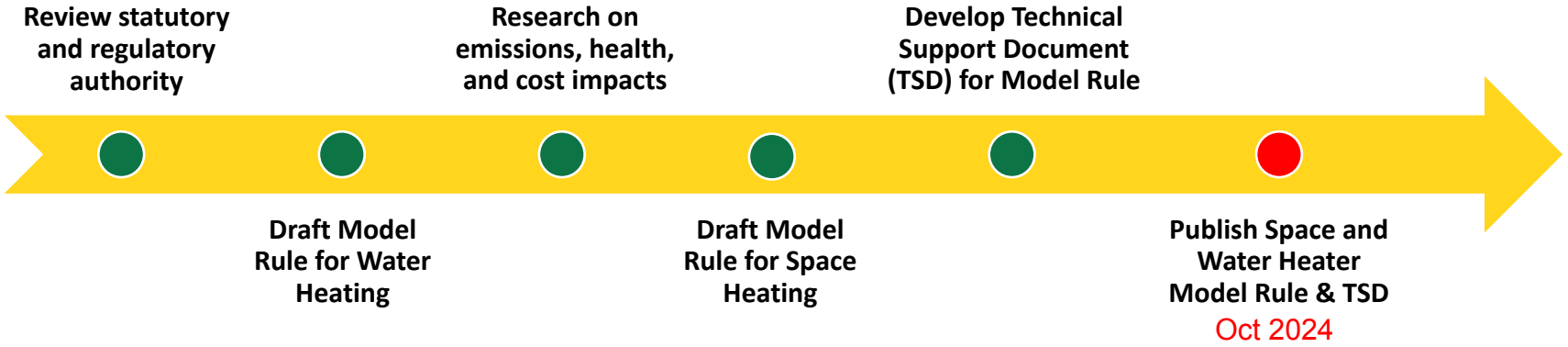
As the regional nonprofit association of state air quality and climate agencies in the Northeast, NESCAUM:

- Assists member states in meeting air quality, climate, and environmental justice goals
- Provides scientific, technical, analytical and policy support to states
- Collaborates with states outside the region to advance zero-emission buildings and vehicles
- Operates the Ozone Transport Commission (OTC), charged with developing and implementing regional solutions to ground-level ozone in the Northeast and Mid-Atlantic



NESCAUM plans to publish its ZEHES Model Rule this October

- NESCAUM is working with states, technical consultants, and manufacturers to develop model rules for zero-emission space and water heating
- States that use the model rule still need to go through a full rulemaking and stakeholder process
- States can adapt the model rule as they see fit



Inputs to the ZEHES Model Rule

- *NOx Standards for Water Heaters* published by the Regulatory Assistance Project (RAP) in 2023
- Scoping proposals and decisions for zero-emission equipment standards by BAAQMD (final), SCAQMD (in progress), and CARB (in progress)
- Assessment of the cost and market feasibility for installing air-source heat pumps and heat pump water heaters
- Assessment of emissions and health impacts of residential electrification
- Recommendations from NESCAUM technical consultant on factors such as market prevalence of fuel and equipment types, equipment definitions, and market readiness
- Input from stakeholders, including manufacturers and members of NESCAUM's Environmental Justice Advisory Group

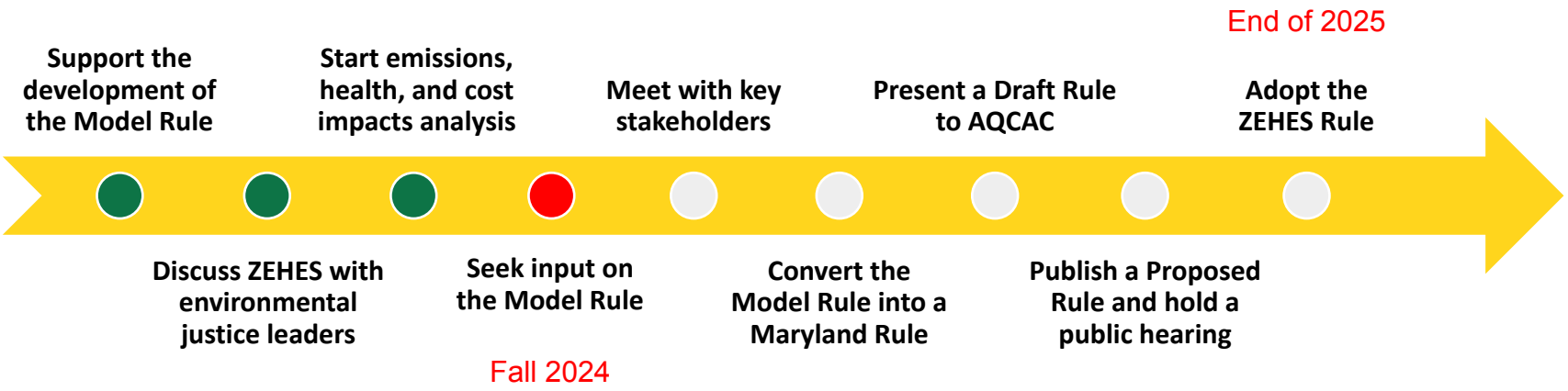
ZEHES Model Rule Overview

- **Pollutants covered:** NOx and combustion GHG (carbon dioxide, methane, and nitrous oxide)
- **Equipment types covered:** furnaces, boilers, and water heaters
- **Fuel types covered:** pipeline gas (natural gas), heating oil, and propane
- **Requires a low-NOx or zero-emission option when installing new equipment in both new and existing buildings after specific compliance dates**
  - Does not require changing out existing functional equipment
  - Allows existing equipment to be serviced and maintained
  - Allows for the temporary installation of non-compliant equipment

Allows for temporary installation of non-compliant equipment

- The Model Rule will contain a provision allowing for temporary installation of non-compliant equipment “to provide sufficient time to complete modifications to the building that are necessary for installation of a water heater, boiler, or furnace.”
- SCAQMD is proposing an alternative compliance option that would allow a supplier to install non-compliance equipment for up to six months to allow for permitting, electrical upgrades, etc.

MDE intends to get stakeholder input on the Model Rule in 2024 and adopt a final ZEHES rule by the end of 2025



Clean Heat Standard (CHS)

Requiring building sector emissions to reduce at the pace required to meet Maryland's clean air and climate change goals

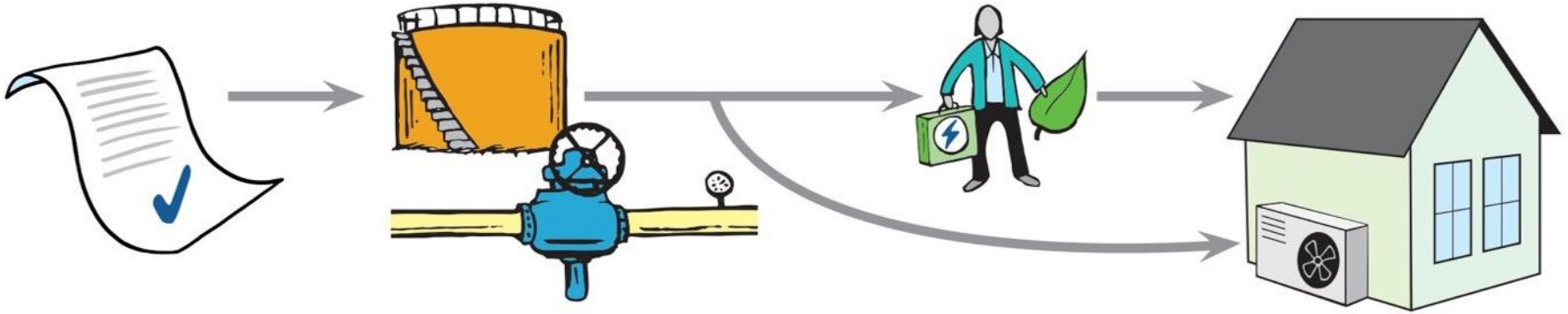
What is the Clean Heat Standard (CHS)?

CHS is a performance standard, requiring fossil heat providers to deliver a gradually-increasing percentage of clean heat services to customers

CHS encourages fossil heat providers to become clean heat providers

- Similar to the Renewable Portfolio Standard for the electricity sector
- Clean heat schedule matches the state's GHG reduction schedule
- Clean heat choices: weatherization, electric heat pumps, alternative fuels
- Obligated parties can deliver help customers convert to zero-emission heating systems, deliver alternative fuels, or purchase credits from others
- Eligible actions can earn Clean Heat Credits even if "caused" by other programs – e.g., federal rebates and tax credits, WAP, EmPOWER, private HVAC contractors, etc.

Elements of the CHS



A state-specific rule

Placing a quantitative obligation on fossil heating companies,

To create clean heat credits by delivering clean heat services directly or through a third party. Examples:

- Building insulation
- Heat pumps for space and water heating
- Low-emissions fuels
- Other measures in residential and commercial buildings

Who is an obligated party?

- Obligated parties are pipeline gas utilities and companies that deliver heating fuels including fuel oil and propane
- Third parties (HVAC contractors, housing providers, etc.) are not obligated, but can earn Clean Heat Credits and sell them to obligated parties
- Building owners and residents are not obligated, but benefit from the investments others make in generating Clean Heat Credits

What is the obligation?

- Obligated parties must reduce GHG emissions by ensuring delivery of clean heat services to Marylanders
- The obligation is in proportion to each company's fossil heat sales
- Clean Heat Credits are earned by actions at customer locations in Maryland that reduce emissions, measured in tons of CO2e
- Credits must be retired each year
- Obligated parties have the option to outsource their obligation to the state's designated delivery agent

What actions earn Clean Heat Credits?

- Weatherization
- Zero-Emission Heating Equipment
  - Electric heat pumps
  - Heat pump water heaters
  - Solar thermal
- Alternative Fuels*
  - Biofuels
  - Hydrogen

*Alternative fuels will be evaluated on a net lifecycle emissions basis

What are the environmental guardrails?

- Credits earned on a net lifecycle emissions basis, using the EPA and Argonne National Lab's GREET analysis
- No credits for fossil-to-fossil fuel switching
- Sustainability requirements for biodiesel, biomethane, and biomass:
  - Biomethane must be deliverable to Maryland; no credits for avoidable methane;
  - Carbon intensity limits become stricter over time

How is equity addressed in CHS?

- Energy justice is a core goal of the CHS
- Progressive inclusion mandate requires delivery of clean heat services to low- and moderate-income households
- Supports weatherization and heat pumps that reduce household energy costs

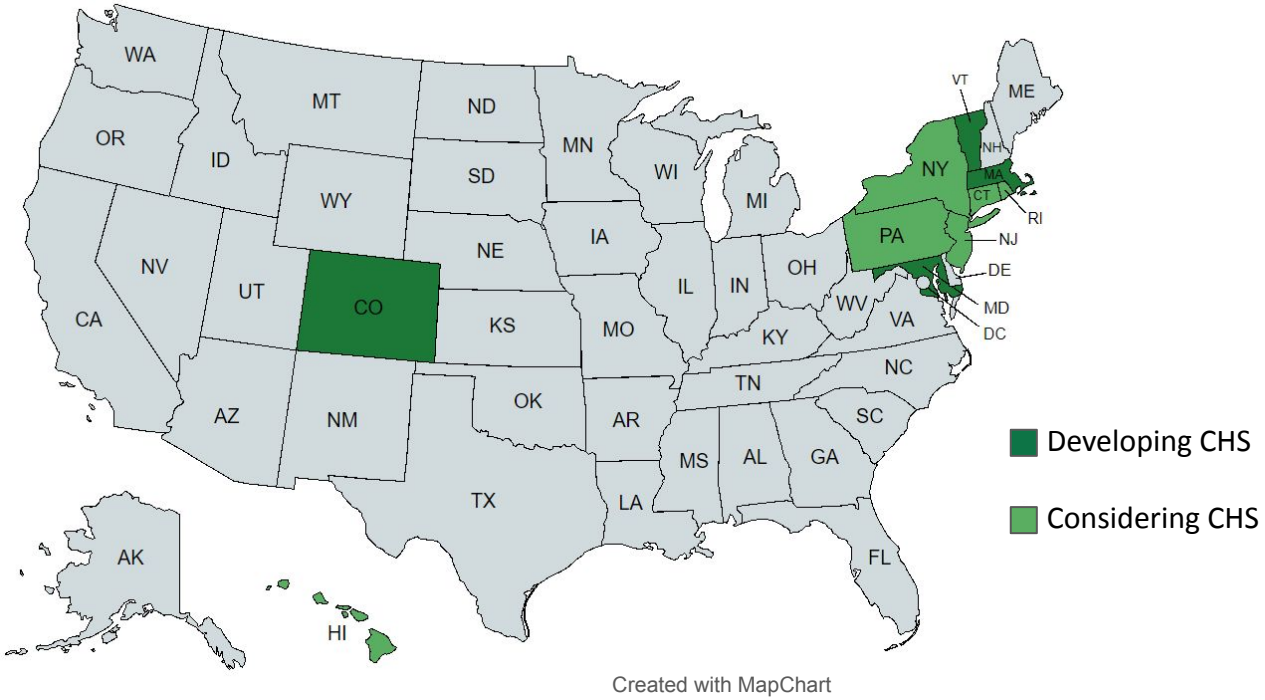
When would the CHS program begin?

- 2026:
  - Obligated parties begin reporting data to MDE
  - Obligated parties can earn Early Action Credits
- 2027:
  - Obligated parties begin registering – directly or through a contractor – enough Clean Heat Credits to meet their annual obligation
  - Consumers begin receiving additional information about and incentives for clean heat services

CHS Benefits

- Sets a clear, predictable, long-range schedule for Maryland to transition from fossil heat to clean heat
- Obligated parties are motivated to promote the lowest-cost options for deploying clean heat measures, such as promoting existing incentives
- Supports other policies and provides incentives to help building owners pay for ZEHES and Building Energy Performance Standards (BEPS)
- Assures benefits to low- and moderate-income families
- Allows diverse clean heat resources and customer choice
- Supports heat pumps with credits, and promotes replacement before failure
- Polluters pay; no electric rate impacts

At least ten states including a cluster of states in the Mid-Atlantic and Northeast are developing or considering CHS



MDE intends to adopt a CHS Reporting Rule in 2025 and add Performance Standards in 2026

Secure technical assistance from the Regulatory Assistance Project (RAP)

Publish a Paper on how CHS would work in MD

Begin drafting the CHS Rule

Start emissions, health, and cost impacts analysis

Fall 2024

Seek input from stakeholders

Present a Draft Reporting Rule to AQCAC

Publish a Proposed Reporting Rule and hold a public hearing

Adopt the Reporting Rule

End of 2025

Present a Draft Performance Standards Rule to AQCAC

Publish a Proposed Performance Standards Rule and hold a public hearing

End of 2026

Adopt the Performance Standards Rule

RAP's paper, *Meeting the Thermal Challenge: A Clean Heat Standard for Maryland*, is available online: https://www.raponline.org/knowledge-center/meeting-thermal-challenge-clean-heat-standard-maryland

Seeking Stakeholder Input

Preview of the Fall 2024 outreach schedule to collect stakeholder input on ZEHES and CHS program design

Maryland
Department of
the Environment

Fall 2024 Outreach Schedule

- September:
  - Preview ZEHES and CHS for AQCAC
- October:
  - NESCAUM webinar on the ZEHES Model Rule
- November:
  - MDE webinar on ZEHES and CHS
  - Launch process for collecting stakeholder input
  - Meet with obligated parties and other stakeholders
- December:
  - Additional meetings with obligated parties and other stakeholders

Contact Us

Website

mde.maryland.gov

Email

camryn.arnstein@maryland.gov

Social Media

@md_environment