

# MAINE

## ZERO-EMISSION STANDARDS FOR HVACS AND WATER HEATERS

**More than 80% of homes** in Maine burn fossil fuels including fossil gas, heating oil, and propane for space and water heating. Furnaces and water heaters are a leading source of the state's health-harming nitrogen oxide (NOx) pollution. Fossil fuels from homes and businesses release about **21% of the state's NOx pollution** each year – **more than 14 times as much** as Maine's power plants and **more than all of the state's heavy-duty vehicles**.<sup>1</sup>



### Burning fossil fuels to heat buildings kills Mainers every year

NOx **harms health directly** and also contributes to the formation of deadly **fine particulate matter** (PM2.5) and **ozone**, which are associated with respiratory, cardiovascular, cognitive, reproductive, and developmental harms; cancer; and early death. While the state is in attainment with federal air quality standards for ozone and PM2.5, pollution levels below those federal limits can still harm Mainers' **health**.

Outdoor pollution from fossil fuel use in buildings caused an estimated **21 premature deaths** in Maine in 2017.<sup>2</sup> Further analysis using EPA's Co-Benefits Risk Assessment tool indicates that this pollution causes about **150 cases of respiratory symptoms** and **300 work loss days** per year, with total health impacts valued at nearly **\$75 million annually**.<sup>3</sup> And this pollution disproportionately harms people of color. In Maine, **People of Color are exposed to 30% more PM2.5** pollution from household gas combustion than White residents, and Black residents' exposure is 70% higher than White residents.<sup>4</sup>

### Fossil fuel-powered heating and water heating worsens climate change

Fossil fuel use in buildings is also a **significant contributor to climate pollution**. Combustion in residential and commercial buildings emits **nearly 20% of the state's greenhouse gas (GHG) emissions**, which is more than the climate emissions from the state's power sector or industrial sector. The total annual health and climate impacts of building pollution in Maine are estimated to be **at least \$430 million** and would be even higher using EPA's latest proposed value for the social cost of carbon.<sup>5</sup>

<sup>1</sup> Emissions data from [EPA, 2020 National Emissions Inventory](#). Equipment estimates include residential & commercial emissions for the gas, oil, & other fuel categories, with commercial emissions adjusted to exclude certain non-appliance sources like pipeline compressor stations.

<sup>2</sup> Based on RMI analysis using median estimates from the results of 3 reduced complexity models used in: Jonathan J. Buonocore et al., *A Decade of The U.S. Energy Mix Transitioning Away from Coal: Historical Reconstruction of the Reductions in the Public Health Burden of Energy*, 2021 Environ. Res. Lett. 16 054030, <https://doi.org/10.1088/1748-9326/abe74c>, as well as additional analysis from the study's lead author.

<sup>3</sup> Analysis using [EPA, CO-Benefits Risk Assessment Health Impacts Screening and Mapping Tool \(COBRA\)](#) with selected subsectors: commercial coal, commercial gas, commercial oil, and residential other.

<sup>4</sup> Christopher W. Tessum et al., *PM<sub>2.5</sub> Polluters Disproportionately and Systemically Affect People of Color in the United States*, *Sci. Adv.* 7:18, supplementary data file S2 (2021), <https://advances.sciencemag.org/content/suppl/2021/04/26/7.18.eabf4491.DC1>.

<sup>5</sup> Based on estimates of premature death and emissions cited in this fact sheet, & using EPA [Value of Statistical Life](#) & Interagency Working Group [Social Cost of Carbon](#) (3% discount rate).

## **DEP Can End This Pollution With Healthy Air Standards for Space and Water Heating**

Clean, efficient appliances like electric heat pumps can eliminate direct building emissions and their harmful impacts, and air quality authorities like the Maine Department of Environmental Protection (DEP) can accelerate this transition by enacting **zero-emission standards for space heaters and water heaters**. These standards work by ensuring that some or all new furnaces and water heaters are pollution-free after a given date, and that the standards take effect when existing equipment is replaced at the end of its life and newly installed, which is the most cost-effective time to electrify. Because only about 5% of equipment needs replacement each year, this policy enables a gradual transition, putting minimal strain on the electric grid.

Maine can adopt [zero-emission standards](#) that take effect at a future date to allow the market ample time to prepare for the transition. If passed with adequate lead time, the standards will **serve as a market signal** for manufacturers to ramp up supply of pollution-free equipment like heat pumps to meet future demand.

Zero-emission standards for HVAC and water heating would help the state achieve its **strong climate, air quality, and health targets**. Maine must reduce building pollution to meet its [GHG reduction commitments](#) – 45% reduction from 1990 levels by 2030, 80% by 2050, and carbon neutrality by 2045. According to the [Maine Climate Action Plan](#), reducing the state’s building pollution “will make Maine’s homes and businesses safer, healthier, more comfortable, and more affordable.”

Governor Mills and 24 other governors committed to collectively **reach 20 million heat pump installations by 2030**, with at least 40% of the benefits flowing to disadvantaged communities. Zero-emission equipment standards can help Maine fulfill this commitment, while also building on Maine’s [existing success surpassing its 2025 heat pump target](#) two years early. Though space and water heater standards are technology- and fuel-agnostic, they signal a move toward pollution-free equipment that will help increase heat pump adoption and support the state in fulfilling its portion of the collective heat pump target.

Notably, Maine is **already thinking about zero-emission standards**. In June 2023, the Ozone Transport Commission – an association of 12 states and DC, including Maine – released a [Resolution](#) on reducing emissions of NOx from buildings that considers establishing NOx emissions limits for building equipment. Maine also participates in a [building electrification initiative task force](#) led by Northeast States for Coordinated Air Use Management (NESCAUM) that is exchanging information on zero-emission building equipment, including model rules to address pollution from water and space heating. Maine can be a leader in the regional movement by swiftly adopting zero-emission equipment standards.

Designed properly, standards will serve as a **catalyst and market signal** to drive the action and investments needed for an equitable, affordable transition to pollution-free HVACs and water heaters. The standards could set **sales requirements that ramp up to 100% over time** to drive gradual market adoption and lock in emissions reductions earlier to help achieve near-term goals. Before the standards take effect, the state should prioritize equity-focused complementary policies and investments to support the transition, such as addressing barriers to clean energy improvements in rental housing, particularly in rural and low-income communities, and reaching low-income households with targeted outreach and education. When paired with equity measures, standards can support a statewide movement to clean and healthy homes.

**Addressing building pollution is essential to cleaning the air, saving lives, reducing illness, and meeting state climate targets. Zero-emission standards for HVAC and water heating can ensure clean, healthy homes and businesses for all of Maine.**

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