Building Electrification Policies: An Opportunity for Local and State Governments to Curb Harmful Emissions While Promoting Environmental Justice

Methane gas is a major source of climate pollution in the United States, and as a result, a shift from using fossil fuels to electricity for heating and cooking has become necessary to avoid the worst consequences of climate change.[1] The energy usage of buildings is a prime target for curbing emissions, as gas combustion in buildings produces at least 10 percent of the United States' greenhouse gas pollution.[2] The shift away from gas-fueled heaters, boilers, and stoves -- to all-electric heating and appliances powered by solar, wind, and other sources of zero-carbon electricity -- assists in mitigating the climate crisis by protecting the health and safety of the public and promoting equity.[3] So far, 90 cities and counties located in 12 states and Washington, D.C. have adopted policies requiring or encouraging electrification in buildings.[4]

Heat pumps are one electrification measure that efficiently heat and cool buildings. Access to air conditioning is increasingly imperative to health and safety as the occurrences of dangerous heat waves increase.[5] Many Americans, primarily BIPOC (Black, Indigenous, and people of color) individuals and low-income households, do not have air conditioning or cannot afford to run it.[6] As for heating, almost half of all homes in the United States primarily rely on natural gas.[7] Electricity-powered heat pumps can be "two to four times more energy-efficient than typical gas heating equipment, and they don't directly emit methane."[8] Although the name 'heat pump' can be misleading, heat pumps heat houses during extremely low temperatures while also cooling houses during times of high temperatures. Heat pumps use a condensing liquid that absorbs excess heat indoors and transfers it outside to cool rooms.[9] The heat pump works in reverse by pulling outside air inside and transferring heat in the process to warm rooms.[10] Heat pump water heaters can also effectively replace gas-powered water heaters.[11] Electric heat pumps aid in resiliency during heat waves and in the effort to decrease methane emissions and promote equity.

Electric ranges and induction cooktops are other electrification measures that can replace gas-powered ovens and burners.[12] Gas powered appliances harm the public health by polluting the air.[13] For example, "gas appliances emit more than twice as much NO_x (nitrogen oxides) as

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[1] Leah Louis-Prescott & Rachel Golden, *How Local Governments and Communities Are Taking Action to Get Fossil Fuels out of Buildings*, ROCKY MOUNTAIN INST. (Aug. 9, 2022), https://rmi.org/taking-action-to-get-fossil-fuels-out-of-buildings/?__hstc=213470795.f8cd01394573876a8ad21c36ac18463e.1668347338645.1668347338645.1668347338645.1&__hssc=213470795.2.1668347338645&__hsfp=428098088.
[2] *Id*.
[3] *Id*.
[4] *Id*.
[5] *Id*.
[6] *Id*.
[7] Justin Gerdes, *So, What Exactly is Building Electrification?*, GREENTECH MEDIA (June 5, 2020), https://www.greentechmedia.com/articles/read/so-what-exactly-is-building-electrification.
[8] Maria Gallucci, *Heat Pumps Now Required for New Homes in Washington State*, CANARY MEDIA (Nov. 8, 2022), https://www.canarymedia.com/articles/heat-pumps/heat-pumps-now-required-for-new-homes-in-washington-state.
[9] *Id*.
[10] *Id*.
[11] Gerdes, *supra* note 7.
[12] *Id*.
[13] Louis-Prescott, *supra* note 1.

gas power plants in the United States, despite consuming less gas."[14] Children in a home with gas stoves have a "42 percent increased risk of having asthma."[15] BIPOC and low-income communities are disproportionately impacted by this, as these communities have higher rates of illnesses like asthma.[16] "BIPOC communities are exposed to nearly twice as much fine particulate ($PM_{2.5}$) pollution from household gas appliances as white communities."[17] A shift to electric ranges and induction cooktops helps protect the public health and safety.

To implement electrification including heat pumps, electric ranges, and induction cooktops, local governments use the policy tools of buildings code amendments and building performance standards ("BPS").[18] Local building codes lay out requirements for design, construction, and modification of buildings. These codes can be amended or changed through ordinances or laws which include incentives or requirements for new electric appliances rather than gas appliances. On the other hand, building performance standards require that building owners improve their buildings over time to meet a set performance target. This could be an emissions target in which a building owner must reduce the building's total pollution below a certain threshold by a specific date.[19] The BPS can include incentives and financing to help achieve these targets.

New York City recently amended their building code through Local Law 154, which requires all new construction buildings to be all-electric.[20] New low-rise buildings must meet this requirement starting in 2024 while taller buildings have until 2027.[21] Boston took the route of BPS by passing the Building Emission Reduction and Disclosure Ordinance that "limits carbon emissions from large, existing commercial and multifamily buildings with varying compliance dates based on building size."[22] Those who fail to comply with the BPS must pay a fee to an environmental justice fund that invests in populations most impacted by climate pollution.[23] Denver also limits energy consumption "in existing commercial and multifamily buildings over 25,000 square feet and requires heat pumps for space and water heating once current appliances meet their end of life" through BPS.[24] On top of this, voters approved a sales tax that raises $40 million a year for a climate protection fund in which half of the fund benefits BIPOC and low-income communities.[25]

At a state level, the amending and updating of building codes are also a tool to promote electrification. In Washington, the Washington State Building Code Council ("SBCC") is tasked with updating buildings codes to meet Washington's climate targets.[26] The governor of Washington appoints members to the SBCC.[27] Recently, the SBCC mandated installation of heat pumps for space and water heating in all new-home construction starting in July 2023.[28] Early

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[14] *Id*.
[15] Gerdes, *supra* note 7.
[16] Louis-Prescott, *supra* note 1.
[17] *Id*.
[18] *Id*.
[19] *Id*.
[20] *Id*.
[21] *Id*.
[22] *Id*.
[23] *Id*.
[24] *Id*.
[25] *Id*.
[26] Gallucci, *supra* note 8.
[27] *Id*.
[28] *Id*.

this year, this state body also voted to "restrict the use of gas-fired systems in new office complexes and other large building" effective next year.[29]

All these policy decisions by local and state governments coincide with the recently passed Inflation Reduction Act ("IRA"). The IRA offers "tens of billions of dollars in tax credits, federal rebates, grants, and lending capacity for heat pumps, electric appliances, efficiency retrofits, rooftop solar, and various other building improvements."[30] The White House announced that an additional $4.5 billion will be provided help lower energy costs for low- and moderate-income families.[31] All-electric single-family homes are less costly to build than those that require fossil fuel infrastructure, as costly gas pipelines are no longer necessary.[32] These incentives combined with local and state government building electrification policies and the economics of all-electric buildings prompt a meaningful shift away from gas-fueled stoves, heaters, and boilers. As stated by Rachel Koller, the Shift Zero Managing Director, in response to the SBCC's heat pump mandate, "[f]rom an economic, equity and sustainability perspective, it makes sense to build efficient, electric homes right from the start."[33]

[29] *Id.*
[30] *Id.*
[31] *Id.*
[32] Louis-Prescott, *supra* note 1.
[33] Gallucci, *supra* note 8.