

# Local Pathways and Barriers to Equitable Building Electrification in the Midwest

**An internal research memo to educate and increase capacity for electrification champions in the midwest.**

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Led by The RE-AMP Network and the SAFE Cities project at Stand.earth along with network partners.



## SAFE CITIES

A project from Stand.earth

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# Table of Contents

Acknowledgements.....	3
Executive Summary.....	4
Electrification Pathways “Stoplight” Chart.....	5
Introduction.....	8
Scope & Methodology.....	16
Energy and Housing (In)Equity.....	18
Clean Energy Requirements.....	26
Energy Efficiency and Weatherization.....	28
Fuel Switching.....	33
Local Fossil Fuel Restrictions and State Preemptions.....	39
Discussion.....	42
Glossary.....	44
Appendices.....	46

# Acknowledgements

## Our Project

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# Executive Summary

**This project seeks to understand the legal and policy constraints and opportunities for local governments in four Midwest states—Iowa, Michigan, Minnesota, and Ohio—to advance electrification, and to examine the equity implications for various electrification strategies across the region.** This project is a *snapshot in time*. We name and analyze legislation and standards that are currently in development or otherwise subject to change. While this memo only covers four states, the lessons here have relevance across the Midwest.

**The Midwest has a complex political and policy landscape for local-level transitions away from fossil fuels (primarily methane gas) to heat homes and power appliances.** This landscape includes state preemption of local building electrification mandates in multiple states. Policymakers, advocates, and technical assistance providers face a quickly changing, hard-to-navigate landscape of legislative limitations or directives, legal challenges, and funding opportunities. These differences could easily chill and isolate electrification efforts across states and hide existing opportunities at the local level. This memo is an attempt to provide clarity and amplify what is possible.

**We find that there are open pathways in both the preemption and non-preemption states we examined.** There is no single policy lever that is a best fit as each has its own barriers and equity trade-offs. With that in mind, **this memo also examines many of the equity considerations of our energy and housing economy.** We highlight how each pathway may impact different people in a community because of factors including race, housing status, financial status. Pathways can and should be implemented together to reduce disparities and ensure health and economic benefits reach everyone, especially those disproportionately impacted by air pollution and energy burden.

**To aid readers, we've summarized our findings on policy pathways using a "stoplight" framework.** We show what pathways are **"open"** (legal at the local level), **"closed"** (preempted or illegal at the local level), or **"limited"** (unclear or more nuanced on what is allowed). The associated sections that address these policies are noted in the left hand column.

## Electrification Pathways “Stoplight” Chart

	Iowa	Ohio	Minnesota	Michigan
<b>Residential methane gas use</b> <a href="#">See Energy and Housing (In)Equity, Fossil Fuel Use</a>	21st in the U.S. 60.3% of homes	5th in the U.S. 63.8% of homes	12th in the U.S. 64.7% of homes	4th in the U.S. 74.8% of homes
<b>Commercial methane gas use</b> <a href="#">See Energy and Housing (In)Equity, Fossil Fuel Use</a>	24th in the U.S.	5th in the U.S.	10th in the U.S.	6th in the U.S.
<b>Residential propane use</b> <a href="#">See Energy and Housing (In)Equity, Fossil Fuel Use</a>	7th in the U.S. 12.7% of homes	8th in the U.S. 5.7% of homes	4th in the U.S. 11.1% of homes	1st in the U.S. 8.7% of homes
<b>Average energy burden overall as a percentage of income</b> <a href="#">See Energy and Housing (In)Equity, Energy Burden</a>	3%	2%	2%	3%
<b>Energy burden for low- and very low-income people</b> <a href="#">See Energy and Housing (In)Equity, Energy Burden</a>	6% for low income 15% for very low income	6% for low income 15% for very low income	5% for low income 12% for very low income	7% for low income 18% for very low income
<b>State GHG reduction goals (Year set)</b> <a href="#">See Statewide Clean Energy Policy and GHG Reduction Targets</a>	No reduction target, reporting required. (2007 legislative mandate)	No reduction target.	50% reduction by 2030, net zero by 2050. (2023 <a href="#">legislative mandate</a> )	Carbon neutrality by 2050. (2020 executive order)
<b>Latest building code adoption</b> <a href="#">See Energy Efficiency and Weatherization, Statewide Policies and Programs</a>	Residential and commercial are based on 2012 International Energy Conservation Code (IECC) standards.	Residential based on 2018 International Residential Code (IRC)/IECC. Commercial based on 2012 IECC.	Residential currently based on 2012 IECC. An update is in process. Commercial currently based on 2018 IECC. A recently passed bill requires improvement in the code until achieving 85% efficiency by 2036.	Residential and commercial are weaker versions of IECC 2015. Update to 2021 standard expected for both soon.

	Iowa	Ohio	Minnesota	Michigan
<b>Efficiency target for utilities</b> <a href="#">See Energy Efficiency and Weatherization, Statewide Policies and Programs</a>	Require efficiency work by utilities: <b>YES, with restrictions</b>	Require efficiency work by utilities: <b>NO. Earlier requirement was deleted</b>	Require efficiency work by utilities: <b>YES</b>	Require efficiency work by utilities: <b>YES</b>
<b>Benchmarking</b> <a href="#">See Energy Efficiency and Weatherization, Statewide Policies and Programs</a>	Voluntary programs for public buildings. Recent “Benchmarking” bill preempts local requirements for mandatory reductions, <b>but allows for tracking and reporting.</b>	Required for public buildings, with mandatory reductions. <b>Local policies for private buildings allowed.</b>	<b>Required in some cities for private buildings.</b> Required for all public buildings yearly, public schools monthly.	Required for public buildings. <b>Local policies for private buildings allowed.</b>
<b>Building Performance Standards</b> <a href="#">See Energy Efficiency and Weatherization, Statewide Policies and Programs</a>	Local governments not allowed to require energy reductions	A 2007 Executive Order required energy reductions in state buildings	Buildings that receive state funding must meet the state’s high-performance, energy efficient standard – B3 (“Buildings, Benchmarks, and Beyond”).	Allowed, but not yet required
<b>Promotes Fuel Switching to Electric</b> <a href="#">See Fuel Switching, Statewide Policy</a>	NO	NO	YES	Wood and propane to electric or gas is incentivized.  Gas to electric is effectively prohibited by state energy efficiency law.
<b>Allows local fossil fuel restrictions</b> <a href="#">See Local Fossil Fuel Restrictions and State Preemptions</a>	NO	NO	YES	<b>Yes</b> <b>However,</b> there is concern that one existing law could be interpreted as a preemption.

	Iowa	Ohio	Minnesota	Michigan
<b>Local governments can negotiate franchise agreements, including decarbonization commitments</b> <a href="#">See Franchise Agreements</a>	YES	YES	YES	Partially. The 1905 Foote Act limits municipalities' negotiating power because it grants use of public property to utilities in perpetuity without the need for a franchise agreement.
<b>Tax increment financing</b>	YES	YES	YES	YES
<b>Tax abatements and exemptions</b>	YES	YES	YES	YES
<b>Building industry workforce education</b>	YES	YES	YES	YES

# Introduction

This research is part of a two phase project to overcome barriers to advancing electrification efforts in the Midwest. Phase I seeks to better understand the pathways and barriers to equitable electrification in the Midwest by investigating three questions.

1. What are the **jurisdictional authorities and constraints** in each state related to local government's direct ability to pass policies that limit or fully restrict new fossil fuel infrastructure or incentivize electrification?
2. Within each state, but particularly ones where state legislation has prohibited local policies that mandate all-electric construction or otherwise prevent fossil fuel infrastructure in buildings, are there **novel examples of how the local government** has successfully expanded its jurisdictional authority over electrification and fuel source selection?
3. +++++What are the **related conditions** (laws, policies, economic factors, etc.) **that affect equitable implementation** and inform strategies for minimizing unintended consequences and maximizing community benefits?

Phase I primarily focuses on questions 1 & 3 and sets up a more in-depth local case study analysis in Phase 2.

## What We Mean When We Talk About “Beneficial Electrification”

Electrification is a necessary component of decarbonization for its global emission reduction contributions, public health benefits, and increased affordability potential. For this memo, we use electrification to refer to *replacing fossil-fuel powered appliances and space and water heating with efficient electric options in the buildings where we live, work, pray, and play.*

The relationship between efficiency and electrification, as we'll explore, is not always straightforward. Energy efficiency is familiar – both from a personal and policy perspective – and critical. It measures only the intensity of how much energy is used to perform a certain function. Electric options can be more energy intensive but not necessarily more cost-efficient than their fossil-fueled counterparts – which is part of what makes not all electrification beneficial. Electric resistance heating, which used to be the standard electric heating, is often [more expensive](#) than methane gas.<sup>1</sup>

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<sup>1</sup><https://www.energy.gov/energysaver/electric-resistance-heating#:~:text=Electric%20resistance%20heating%20is%20100,the%20fuel's%20energy%20into%20electricity.https://www.energy.gov>



While all electrification is cleaner within the building itself, and has the potential to be powered by clean energy at the source, equitable beneficial electrification relies on technologies like heat pumps—which provide heating *and* cooling—for their greater efficiency and relative affordability.

Electrifying buildings will be a huge undertaking – but a necessary one, and if implemented properly, a positive one. However, a common concern is that the electric grid will be unable to accommodate the increase in load. While electrifying buildings entirely *will* require [a moderate increase in electricity consumption](#), the majority of load increase, and where grid buildout becomes a problem in a high-electrification setting, comes from transportation.<sup>2</sup> In some cases electrifying buildings will require increased service and grid improvements, because buildings will demand electricity [beyond what local substations](#) can provide.<sup>3</sup> However, the technology is available to efficiently electrify our building stock. The question which this report attempts to help begin to answer remains: politically, practically, equitably – how?

## Why Electrification?

### *Climate*

Climate change poses a threat not only to global, far-off locations, but also to the health and safety of our region. Compared to other American regions, the Midwest is projected to have the [largest increase in extreme temperature-related premature deaths](#) under a high emissions scenario.<sup>4</sup> Climate change also will cause worsened air quality, and create increases in vector-borne diseases and water-related illnesses. Climate change also increases the frequency of extreme weather events which can lead to injury and death directly, or through contamination, damage to buildings, or outages. As stated in the [Michigan Climate Healthy Plan](#), “reducing our GHG emissions as rapidly as possible will help Michigan [and the Midwest] avoid costly and devastating health outcomes to the greatest extent possible.”<sup>5</sup>

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gov/energysaver/electric-resistance-heating#:~:text=Electric%20resistance%20heating%20is%20100,the%20fuel's%20energy%20into%20electricity.

<sup>2</sup>[https://docs.google.com/presentation/d/1R0t2iGRV0b\\_dbr3Y1EjCBW-klbpCQZYg31-hx2aLHhs/edit#slide=id.g1539028024b\\_0\\_5](https://docs.google.com/presentation/d/1R0t2iGRV0b_dbr3Y1EjCBW-klbpCQZYg31-hx2aLHhs/edit#slide=id.g1539028024b_0_5). For a more extensive discussion of transportation electrification, you can refer to RE-AMP's [Transportation Planning for People & Climate](#).

<sup>3</sup><https://www.michigandaily.com/news/ann-arbor/ann-arbor-wants-more-green-buildings-how-quickly-could-developers-adjust/>

<sup>4</sup><https://www.cdc.gov/climateandhealth/effects/midwest.htm#:~:text=Increased%20daytime%20and%20nighttime%20temperatures,to%20care%20is%20a%20concern.>

<sup>5</sup><https://www.michigan.gov/egle/-/media/Project/Websites/egle/Documents/Offices/OCE/MI-Healthy-Climate-Plan.pdf?rev=d13f4adc2b1d45909bd708cafccbffa&hash=99437BF2709B9B3471D16FC1EC692588>

Energy use in buildings, particularly in the Midwest, stands out as a portion of the problem – and an important part of any solution. EPA estimates that [10% of America's Greenhouse Gas \(GHG\) emissions](#) come from methane gas consumption in residential and commercial buildings.<sup>6</sup> According to the research firm Rhodium (Figure 1), direct fuel use in buildings for space and water heating accounts for about 14% of the RE-AMP region's total greenhouse gas emissions, and more than 30% of emissions within cities (see "Scope and Methodology" for RE-AMP Map).<sup>7</sup> This is mostly methane gas but a small percentage is wood, propane, and fuel oil. According to the Rocky Mountain Institute (RMI), [10 states are responsible for 56% of direct building emissions nationally](#). Four out of those ten are RE-AMP states: Illinois, Michigan, Ohio, and Minnesota.<sup>8</sup>

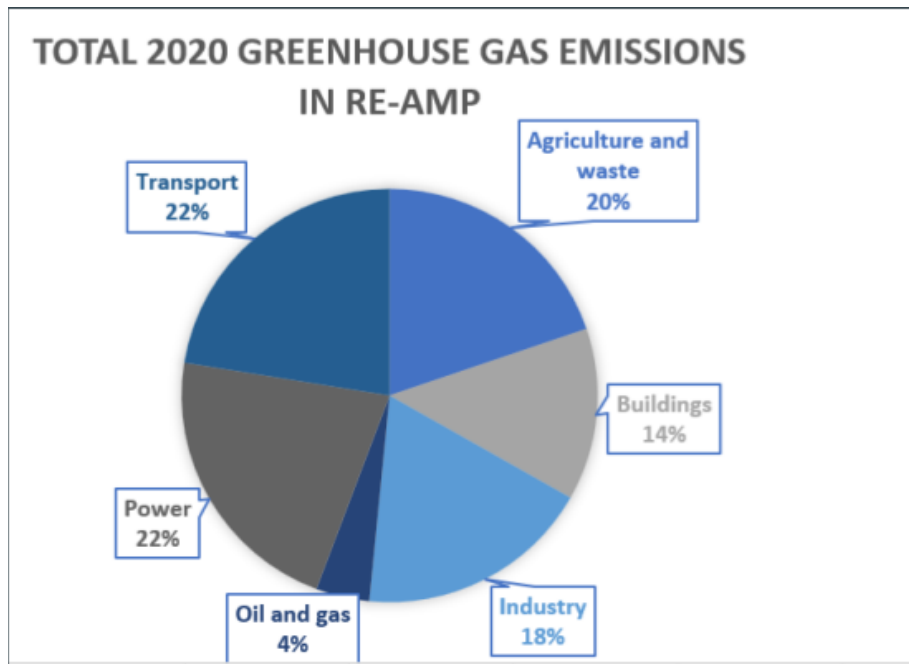


Figure 1: Greenhouse Gas Emissions by Sector in RE-AMP's 9-State Footprint. Source: Rhodium.

From a climate perspective, there is a special need and opportunity to reduce fossil fuel use in buildings across the Midwest. An Environment America report on building electrification scenarios included Illinois, Ohio and Michigan in the [Top 10 States with the most Emission Reductions](#) potential from fuel use through 2050.<sup>9</sup> [New research](#)

<sup>6</sup><https://www.epa.gov/ghgemissions/sources-greenhouse-gas-emissions#commercial-and-residential>

<sup>7</sup>[https://docs.google.com/presentation/d/1R0t2iGRV0b\\_dbr3Y1EjCBW-klbpCQZYg31-hx2aLHhs/edit#slide=id.g14835b636f9\\_0\\_72](https://docs.google.com/presentation/d/1R0t2iGRV0b_dbr3Y1EjCBW-klbpCQZYg31-hx2aLHhs/edit#slide=id.g14835b636f9_0_72)

<sup>8</sup> <https://rmi.org/insight/the-impact-of-fossil-fuels-in-buildings/>

<sup>9</sup><https://environmentamerica.org/wp-content/uploads/2022/07/National-Electric-Buildings-Web-1.pdf>

[from SAFE Cities and partners shows](#)<sup>10</sup> that four RE-AMP states– Minnesota, Ohio, Michigan, and Wisconsin – are all in the top half of states for projected emissions between 2023 and 2030 in new residential buildings. This also means building electrification of new residential buildings would mean a significant drop in estimated greenhouse gas emissions for those states.

Fuel-choice also has climate implications beyond the direct emissions from fossil fuel use in buildings. Methane gas use in homes relies on [pipelines that have been shown to leak methane](#), further polluting our environment and driving climate change.<sup>11</sup> If methane gas use continues to grow, or even to stay steady, the result would be an investment in fossil fuel infrastructure that could lock in emissions for decades.

### *Equity*

While we can make the argument for building electrification from a top-down climate and emissions perspective, what is more important is how it will impact individuals' lives and wellbeing. Speaking about fuel-choice is quite personal: these are people's businesses and homes, this is how they stay warm in winter and cook dinner every night. We recognize that for many, methane gas is a necessity. At the same time, we believe it *should not have to* be a necessity for anyone, when cleaner options are available. Equitable, beneficial electrification is motivated by the principle that everyone deserves equal access to healthy, affordable, reliable energy.

Recent [debate around gas stove regulation](#) has elevated the issue of gas-related health impacts in the home.<sup>12</sup> Studies show that due to exposure to nitric dioxide, children living with a gas stove are [42% more likely to have asthma](#), and that exposure to gas stoves may be responsible for [12.7% of childhood asthma cases](#).<sup>13</sup> Gas stoves also [leak pollutants, including benzene](#) – a known carcinogen.<sup>14</sup>

Though unsafe for everyone, it is important to note that there are specific racial inequities. According a 2021 air pollution study, people of color are [disproportionately](#)

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<sup>10</sup>

<https://www.safecities.earth/wp-content/uploads/2023/09/SAFE-Lead-Locally-Electrification-Report-Digital.pdf>

<sup>11</sup><https://www.npr.org/2022/02/03/1077392791/a-satellite-finds-massive-methane-leaks-from-gas-pipelines#:~:text=natural%20gas%20plant.,Methane%2C%20the%20main%20ingredient%20in%20natural%20gas%2C%20can%20leak%20from,natural%20gas%20plants%20and%20pipelines.&text=There's%20new%20evidence%2C%20collected%20from,in%20natural%20gas%2C%20the%20fuel.>

<sup>12</sup><https://www.npr.org/2023/02/04/1149736969/gas-stove-makers-have-a-pollution-solution-the-ye-just-not-using-it>

<sup>13</sup> <https://academic.oup.com/ije/article/42/6/1724/737113?login=false>;  
<https://www.mdpi.com/1660-4601/20/1/75>

<sup>14</sup> <https://pubs.acs.org/doi/10.1021/acs.est.2c02581>

[exposed to fine particulate air pollution](#), across all income levels, nearly all regions, and all emission sources.<sup>15</sup> Of the sources evaluated in the study, including industry, agriculture and light and heavy duty vehicles, “Residential gas combustion and commercial cooking are among the largest sources of relative disparities.”<sup>16</sup>

These inequities, and the threats to lives and livelihoods they produce, are cumulative and rooted in the legacy of racist housing policy in the United States. Red-lining – the systematic denial of mortgages, insurance loans, and other financial services to residents of certain areas based on their race or ethnicity – was a tool used in the 20th century to reinforce segregation and prevent people of color from building wealth, living in healthy homes, and achieving economic and social mobility. Historically red-lined neighborhoods (classified as Grade D or “hazardous”) across the country [have a higher likelihood](#) of being the site of fossil fuel power plants. They have higher average present-day emissions of nitrous oxides (82%), sulfur dioxide (38%) and fine particulate matter (63%) even compared with ‘declining’ (C-graded) neighborhoods.<sup>17</sup>

Inequities are not limited to air and health.. Many households are already, and disproportionately, burdened by energy costs. According to a nationally representative survey of low-income households, “[more than 28% of respondents](#) reported being unable to pay their energy bill, nearly 20% received a disconnection notice, and 13.5% had their energy service (e.g., electricity, methane gas) disconnected by their utility provider.”<sup>18</sup> Among low-income households, Black and Hispanic households experienced energy insecurity at even higher rates – from November 2021 to January 2022, almost 40% of Hispanic respondents, and more than 26% of Black respondents reported being unable to pay an energy bill (as opposed to 24% of White respondents).

High energy burden is itself tied to worsened health outcomes. As the American Council for an Energy-Efficient Economy (ACEEE) [reports](#), “High energy burdens are correlated with greater risk for respiratory diseases, increased stress and economic hardship, and difficulty in moving out of poverty.”<sup>19</sup>

Though there are many explanations for the correlation, the direct impacts of high energy burden cannot be ignored: in order to pay energy bills, people are forced to

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<sup>15</sup><https://www.epa.gov/sciencematters/study-finds-exposure-air-pollution-higher-people-color-regardless-region-or-income>

<sup>16</sup> See above.

<sup>17</sup> <https://www.nature.com/articles/s41560-022-01162-y>

<sup>18</sup> <https://energyjustice.indiana.edu/doc/ejl-energy-insecurity-report-winter-2022.pdf>

<sup>19</sup><https://www.aceee.org/energy-burden#:~:text=Energy%20Burden%20Report&text=High%20energy%20burdens%20are%20correlated,in%20moving%20out%20of%20poverty.>

forego other necessities. A national [survey on weatherization reported](#) that, “Before weatherization, 33.2% of respondents reported not buying food in order to pay energy bills, and 27.5% of respondents reported they had to forego necessary prescriptions.”<sup>20</sup>

Discussions of electrification have the opportunity and obligation to rethink and change how energy burden is distributed. The same weatherization survey reported that the frequency of respondents reporting forgoing food and prescriptions decreased by 10.1% and 9.0%, respectively, following weatherization.<sup>21</sup> However, there are major challenges to implementing equitable beneficial electrification given the programs currently in place which we will explore throughout this report.

- (1) **Affordability:** Not only does the affordability of energy itself pose a challenge, but also the affordability of the solutions we present.

The federally-funded, state-implemented Low-Income Home Energy Assistance Program (LIHEAP) and Weatherization Assistance Programs (WAP) are the primary support programs for low-income efficiency upgrades. They are also drastically underfunded. In 2019, ACEEE estimated that the federally-funded WAP [only served .2% of eligible low-income households](#).<sup>22</sup> LIHEAP historically has served [under 20% of eligible households](#).<sup>23</sup> State contributions are critical to how the program is funded, and insufficient to bridge the funding gap. According to a 2021 RMI estimate, in each of the four states we will focus on in this research, [LIHEAP served about 20%](#) of households eligible– ranging from a low of 16.8% in Ohio to a high of 22.6% in Michigan.<sup>24</sup>

There is an infusion of funds [coming from the 2021 Infrastructure Investment and Jobs Act \(IIJA\)](#) – \$3.5 billion for WAP – and additional billions of potentially available funds for low-cost energy efficiency upgrades for low income households in other funding buckets of the IIJA and the 2022 Inflation Reduction Act (IRA).<sup>25</sup> However, the infusion of cash alone is not enough to bridge the gap. Thoughtful implementation such as addressing pre-weatherization and deferral concerns, and designing focused programs

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<sup>20</sup> [https://weatherization.ornl.gov/wp-content/uploads/2021/01/ORNL\\_TM-2020\\_1566.pdf](https://weatherization.ornl.gov/wp-content/uploads/2021/01/ORNL_TM-2020_1566.pdf)

<sup>21</sup> [https://weatherization.ornl.gov/wp-content/uploads/2021/01/ORNL\\_TM-2020\\_1566.pdf](https://weatherization.ornl.gov/wp-content/uploads/2021/01/ORNL_TM-2020_1566.pdf)

<sup>22</sup> <https://www.aceee.org/blog-post/2020/07/weatherization-cuts-bills-and-creates-jobs-serves-only-tiny-share-low-income>

<sup>23</sup> <https://www.eenews.net/articles/heat-kills-this-underfunded-program-could-help/>

<sup>24</sup> [https://chart-studio.plotly.com/~mcastillo/5/?share\\_key=3TOrdDaayhVxKgU4SMGaPf#/](https://chart-studio.plotly.com/~mcastillo/5/?share_key=3TOrdDaayhVxKgU4SMGaPf#/)

<sup>25</sup> [https://www.mwalliance.org/sites/default/files/meea-research/slicing\\_the\\_pie\\_of\\_ee\\_funding\\_in\\_iija\\_and\\_ira\\_-\\_2023-04-18.pdf](https://www.mwalliance.org/sites/default/files/meea-research/slicing_the_pie_of_ee_funding_in_iija_and_ira_-_2023-04-18.pdf)

and guidelines to flex funds towards low-income households are [critical in realizing](#) the full benefits of the increased funding.<sup>26</sup>

Outside of LIHEAP and WAP, when implementing alternative financing options, it is important to consider concerns about accurately estimating energy and cost savings. There *must* be systems in place to make sure participants have the ability to pay for loans and upgrades they commit to.

- (2) **Accessibility:** Program eligibility requirements and design can often fail to address vulnerable populations. The great majority of programs apply only to homeowners. Financing options are often lacking for moderate income individuals who are not able to afford upgrades, and not eligible for low-income programs. Government incentives are often only accessible for US citizens and some qualified immigrants – and states or utilities that do have more inclusive eligibility do not always clearly communicate that. In general, inconsistent funding and lack of coordination can also create confusion around the availability of programs, particularly for disadvantaged communities. In some cases, [a person's social network can provide more valuable information](#) than agencies that actually provide programs.<sup>27</sup> Outreach is [not always considered as cost-effective](#) because it invests money into individuals who might not actually use a program, and getting help can be a complicated or intrusive process.<sup>28</sup> This makes clear and congenial pathways of information all the more important.

Even for those who are demographically eligible, program design needs to account for the full range of housing stock. Project selection depends on the [costs and benefits](#) of paying for non-energy repairs like pre-weatherization. Houses in poor condition needing more repairs before weatherization or efficiency upgrades are more likely to fail financial feasibility requirements. By not uniformly including pre-weatherization, the programs reinforce another barrier to accessibility.<sup>29</sup>

- (3) **Unintended consequences:** Policies *need* to be designed in ways that account for their impacts on disadvantaged communities, and to minimize any potential unintended consequences. For beneficial electrification, this includes concerns about the comparative cost and reliability of electricity; program implementation in multi-family, older, and affordable housing; gas

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<sup>26</sup><https://www.npr.org/2022/05/13/1096114029/low-income-energy-efficient-weatherization-program-3-5b-need>

<sup>27</sup> <https://operationfuel.org/wp-content/uploads/2022/07/ENERGY-JUSTICE-HEALTH-CT.pdf>

<sup>28</sup> <https://www.energy.gov/sites/default/files/2021-07/ee-financing-lmi.pdf>

<sup>29</sup> <https://www.energy.gov/sites/default/files/2021-07/ee-financing-lmi.pdf>

rates rising for lower-income individuals as those with the ability to switch electrify; and potential displacement related to efficiency upgrades or electrification.

### *Economic Benefits*

While keeping equity and affordability in mind, it is worth noting the potential economic benefits of electrification. Particularly in states and localities where using climate framing is more a hindrance than a motivator, cost and profit remain the bottom line for buy-in.

We are not economists, and state-by-state, city-by-city, even individual-by-individual, more analysis is needed. However, [RMI estimates show](#) that new all-electric homes are cost-competitive with homes that use mainly gas appliances, particularly in warmer climates, both for up-front costs and annual utility rates.<sup>30</sup> Increasing energy efficiency and electrification will also require an infusion of labor: it has the potential to create jobs for electricians, HVAC contractors, and plumbers. Right now, there is a shortage of contractors, and it can be particularly difficult to attract contractors to do often relatively small ([average WAP upgrades per dwelling in Michigan were around \\$8,000](#)) efficiency upgrades.<sup>31</sup> But already, energy efficiency is a huge basis for labor and economic activity: in a study of energy efficiency jobs nationwide, E4 The Future reports that 99.7% of counties in the US have energy efficiency workers – [more than 2 million people nationwide](#).<sup>32</sup> Clean Jobs Midwest reports that there are [over 350,000 people](#) working in energy efficiency within the RE-AMP states.<sup>33</sup>

## **The Need for Research on the Midwest**

Midwest energy fuel use and cold winter climate present a unique problem for building electrification. All nine of the states in the RE-AMP network are above the national average<sup>34</sup> for combined [methane gas and propane use](#)<sup>35</sup>. The role of methane gas in electricity generation is expanding, as Midwest states are replacing coal generation with gas. While annual consumption of methane gas is variable, in many RE-AMP states – Ohio most notably – it has been [increasing steadily](#)<sup>36</sup> across

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<sup>30</sup> [https://rmi.org/wp-content/uploads/dlm\\_uploads/2020/10/eeb\\_all\\_cities.pdf](https://rmi.org/wp-content/uploads/dlm_uploads/2020/10/eeb_all_cities.pdf)

<sup>31</sup> [https://www.michigan.gov/mdhhs/-/media/Project/Websites/mdhhs/Inside-MDHHS/Reports-and-Statistics---Human-Services/State-Plans-and-Federal-Regulations/DOE\\_WAP\\_State\\_Plan\\_s.pdf?rev=6f7d0b858d234f90a75b9fc2af32a291&hash=9D032132510FD2AF3FC98B2E7B8FA37F](https://www.michigan.gov/mdhhs/-/media/Project/Websites/mdhhs/Inside-MDHHS/Reports-and-Statistics---Human-Services/State-Plans-and-Federal-Regulations/DOE_WAP_State_Plan_s.pdf?rev=6f7d0b858d234f90a75b9fc2af32a291&hash=9D032132510FD2AF3FC98B2E7B8FA37F)

<sup>32</sup> [https://e4thefuture.org/wp-content/uploads/2022/12/EE-Jobs-in-America\\_All-States\\_2022.pdf](https://e4thefuture.org/wp-content/uploads/2022/12/EE-Jobs-in-America_All-States_2022.pdf)

<sup>33</sup> <https://www.cleanjobsmidwest.com/state/wisconsin>

<sup>34</sup> [https://data.census.gov/table?q=B25117:+TENURE+BY+HOUSE+HEATING+FUEL&g=010XX00U\\_S\\_040XX00US19,26,27,39&y=2021](https://data.census.gov/table?q=B25117:+TENURE+BY+HOUSE+HEATING+FUEL&g=010XX00U_S_040XX00US19,26,27,39&y=2021)

<sup>35</sup> <https://docs.google.com/spreadsheets/d/1AUQGTypMLjpD5EwMt4b62ckojC7cNct3weyJcQs0uuU/edit#gid=1312400733>

<sup>36</sup> [https://www.eia.gov/dnav/ng/ng\\_cons\\_sum\\_dcu\\_SWI\\_a.htm](https://www.eia.gov/dnav/ng/ng_cons_sum_dcu_SWI_a.htm)



sectors since 2017. This means that fossil fuels in Midwest buildings have outsized and growing health and safety effects – particularly for BIPOC, lower income, and other marginalized people—as well as outsized and growing climate impacts.

The legal landscape within each state and across the Midwest is also challenging and dynamic, with a growing number of states passing policies barring, or “preempting,” local governments from restricting or banning methane gas. In some cases, these preemption laws are [written in broad strokes](#) to potentially include any resolution, mandate, or ordinance that makes it harder to provide gas or propane.

Fortunately, there are many layers of state and local action on greenhouse gas emissions, energy efficiency, fuel-switching, and more. Being able to see all the layers and compare across states will help leaders navigate opportunities and challenges. This will grow the movement for electrification of buildings in the Midwest and lead to more key state and local policies.

## Scope & Methodology

To stay within a research scope that could be completed in the first half of this year, we chose four states to focus on: Iowa, Ohio, Michigan, and Minnesota. Each state is unique. However, these four represent a wide range of policy, political, and demographic landscapes across the Midwest. The issues, trends, and pathways discussed in this memo can still be used to explore the same

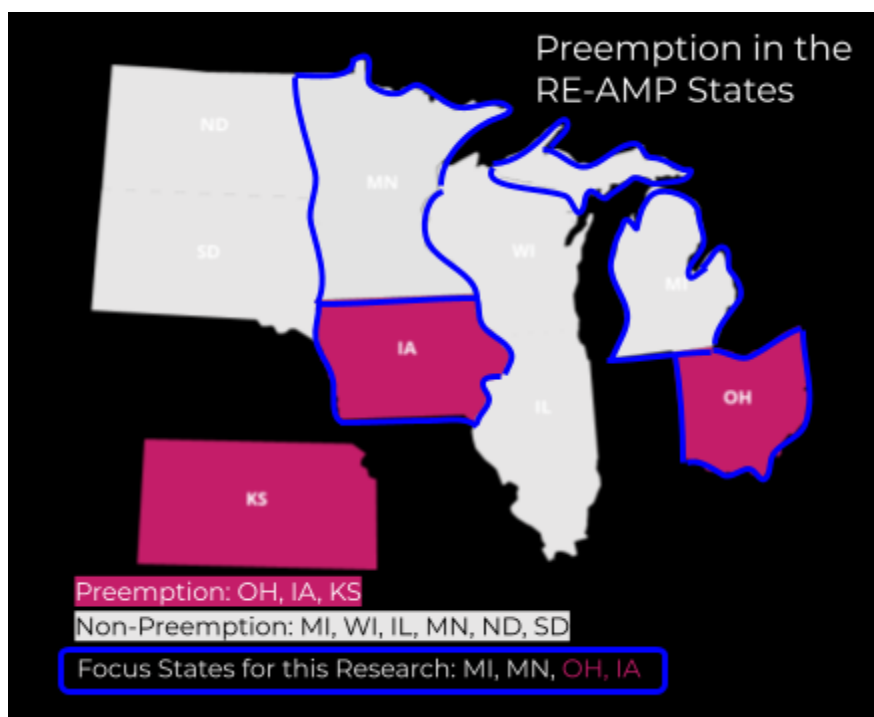


Figure 2. RE-AMP States by Preemption and Research Focus

in states not included. Where one goes the others might follow – for worse and better. One of the key criteria was selecting states with and without state preemption of local prohibitions on methane gas in buildings. Iowa and Ohio are two of the states in the Midwest with state preemption and Michigan and Minnesota are two of the states currently without state preemption. All four states are in the [top](#)



[half of gas use by state](#),<sup>37</sup> with Ohio and Michigan in the top 10. The Midwest also has the highest share of [homes heated by propane](#),<sup>38</sup> with particularly high use in [all four states in the top 10 for residential propane use](#).<sup>39, 40</sup>

There are five topics the research covers for each state to provide context on the conditions under which electrification is happening.

1. Energy and Housing (In)Equity
2. Clean Energy Requirements
3. Energy Efficiency and Weatherization
4. Fuel switching
5. Local Restrictions on Fossil Fuels in Buildings and State Preemptions

We look at both statewide and local programs and policies as well as utility clean energy plans and energy efficiency or electrification programs to glean how these efforts (or lack thereof) may interact with local efforts to advance electrification. High-level takeaways and information is included in the main body of the report, but additional information behind specific state, local, or utility programs and policies is included in the appendices. For our exploration into utilities, we follow the same Investor Owned Utility (IOU) in each state (Xcel, Mid-American, AEP Ohio, DTE), one Rural Electric Cooperative (REC) located in Michigan (Cherryland Electric), and one municipal utility (Cedar Falls, Iowa). These utilities are not necessarily all the biggest providers in each state, the most progressive or the least progressive, but they are particularly helpful for understanding incentive programs for fuel switching and energy efficiency and the role they play in local electrification.

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<sup>37</sup>

<https://www.spglobal.com/marketintelligence/en/news-insights/latest-news-headlines/states-that-outlaw-gas-bans-account-for-31-of-us-residential-commercial-gas-use-70749584>

<sup>38</sup>

<https://www.eia.gov/todayinenergy/detail.php?id=49296#:~:text=The%20Midwest%20has%20the%20highest,where%20heating%20demand%20is%20greatest.>

<sup>39</sup> [https://www.eia.gov/state/seds/sep\\_sum/html/pdf/sum\\_btu\\_res.pdf](https://www.eia.gov/state/seds/sep_sum/html/pdf/sum_btu_res.pdf)

<sup>40</sup>

<https://www.eia.gov/todayinenergy/detail.php?id=49296#:~:text=The%20Midwest%20has%20the%20highest,where%20heating%20demand%20is%20greatest.>

# Energy and Housing (In)Equity

Understanding the distribution of fossil fuel impacts, energy burden, and housing demographics in our focus states – as well as what protections are (and are not) in place for energy consumers – is critical to anticipating how changes to energy policy might affect disadvantaged populations. While these topics are vast, and worthy of reports of their own, we provide a starting point for understanding the intersection of electrification, housing, and equity.

## Energy Burden

According [to the Department of Energy \(DOE\)](#), Michigan and Iowa have average energy burdens of about 3% of income, and Ohio and Minnesota have median energy burdens of 2%.<sup>41</sup> But for low income households, the energy burden is much higher. For those with 30-60% of the area median income in our states, average energy burden ranges from 5% of income in Minnesota to 7% in Michigan. For those with 0-30% of the area median income, it ranges from 12% in Minnesota to 18% in Michigan (Figure 3). When broken down by home heating fuel source, it is clear that of the major heating sources, households using propane face the higher energy burdens for all states, for all income brackets. It is also notable that gas-heated households tend to have higher average energy burdens than electric-heated households. This is most pronounced for very low-income (<30% area median income) individuals in Michigan: for gas-heated households, on average 18% of income goes towards energy, whereas for electric-heated households, it is 13%.

We know that the effects of pollution, heat exposure, low efficiency, and energy burden are cumulative. If we want to address the harms of fossil fuel use, it is also important to consider the current energy burdens, from both fossil fuels and electricity, that disadvantaged communities in our states face. In 2019, researchers from University of Michigan and the Michigan Environmental Justice Coalition [found that](#) “that high household energy burdens, low residential energy efficiency, and extreme heat exposure, are concentrated in the same census tracts which are more highly exposed to DTE air pollution, and more likely to be Black, People of Color, and low-to-moderate-income.”<sup>42</sup>

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<sup>41</sup> <https://www.energy.gov/scep/slsc/lead-tool>

<sup>42</sup> <https://ourpowermi.org/research/health-impact-assessment/>

### Energy Burden for Michigan, Iowa, Ohio, and Minnesota

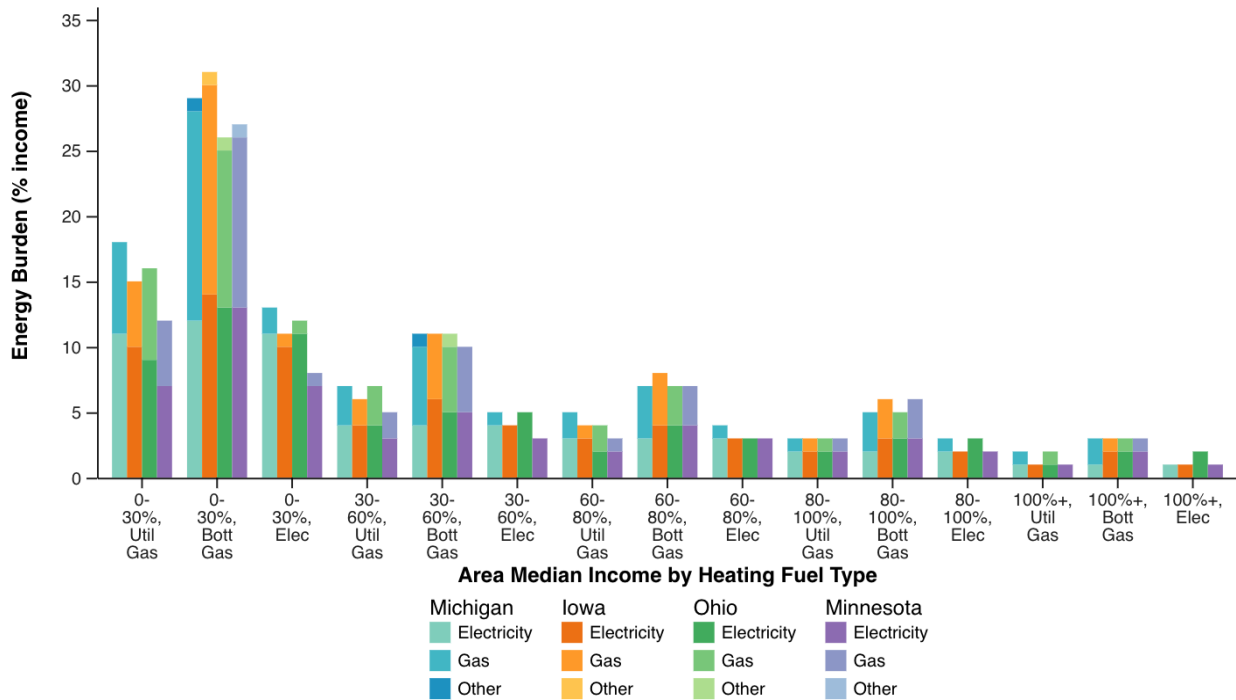


Figure 3: Energy Burden in Focus States, by Income Bracket and Home Heating Fuel. Source: DOE Low-Income Energy Affordability Data Tool.

Inequity is also built into the quality of energy infrastructure. As researchers at the University of Maryland have [found](#), zip codes with higher populations of people of color experienced significantly more outages, even after controlling for factors like income and population density. Even “a 1% increase in a zip code’s percentage of households with a black resident predicted over 7000 additional hours of outages per month in that zip code.”<sup>43</sup> With that in mind, the quality of the overall system is all the more important. But in 2022, CNN reported that outages in the past had increased by 64% compared to the prior decade – and that [Michigan had the second highest](#) number of weather-related outages in the country.<sup>44</sup>

In addition to outages, energy-burdened individuals have to worry about shutoffs when they cannot pay utility bills. [Michigan and Ohio](#) had the 4th and 5th most electricity disconnections, respectively – and by utility, DTE had the 3rd most, and AEP the 7th most of any utility parent companies in the country.<sup>45</sup> Between June

<sup>43</sup><https://research.umd.edu/articles/infrastructure-inequality-energy-injustice-lurks-our-power-grid>

<sup>44</sup><https://www.cnn.com/2022/09/14/us/power-outages-rising-extreme-weather-climate/index.html>

<sup>45</sup>[https://www.biologicaldiversity.org/programs/energy-justice/pdfs/Powerless-in-the-US\\_Report.pdf](https://www.biologicaldiversity.org/programs/energy-justice/pdfs/Powerless-in-the-US_Report.pdf)

2020 and May 2021, [AEP Ohio cut off power](#) to its customers on 124,157 occasions with their unpaid bills collectively totaling about \$60 million.<sup>46</sup> In terms of utility debt, The National Consumer Law Center rates [Michigan worse than all but four other states](#), giving it an F for failing to protect its residents in utility debt cases because it allows wide latitude for creditors to seize Michiganders' property and income.<sup>47</sup>

## Fossil Fuel Use

<u>Fossil Fuel Use by State</u>				
	Ohio	Iowa	Michigan	Minnesota
Homes heated with methane gas	63.8%	60.3%	74.8%	64.7%
Homes heated with Propane	5.7%	12.7%	8.7%	11.1%
Fossil Fuel Total for Heating	71.5%	73.4%	84.5%	77.1%

Figure 4. Fossil fuel use statistics for home residential space heating by state. Source: US Census Data.

The harms of using fossil fuels in our buildings are clear for our states. Though the true price cannot be reduced monetarily, researchers in 2021 estimated the cost of air pollution from burning fossil fuels in buildings in terms of loss of life and health impact costs. The price tag is [enormous](#): ranging from 125 deaths and \$1.404 billion for Iowa up to an estimated 865 early deaths and \$9.69 billion in health impact costs.<sup>48</sup> These impacts are concentrated in underserved communities.

Census data can provide an incomplete (only residential, not commercial or industrial), but useful picture of fuel use by state. A large majority of households use fossil fuels (including methane gas, propane, and heating oil) to [heat their homes](#):

<sup>46</sup><https://ohiocapitaljournal.com/2022/05/16/gas-electric-companies-cut-off-270000-ohioans-a-mid-pandemic-and-billions-in-profit/>

<sup>47</sup>[https://www.propublica.org/article/detroit-dte-utilities-lawsuits-debt-collection?utm\\_medium=email](https://www.propublica.org/article/detroit-dte-utilities-lawsuits-debt-collection?utm_medium=email)

<sup>48</sup> <https://rmi.org/health-air-quality-impacts-of-buildings-emissions>

ranging from a low of 71.5% in Ohio to 84.5% in Michigan.<sup>49</sup> Most of this is driven by methane gas: from 60% in Iowa to almost 75% of homes in Michigan. However, propane also accounts for a significant percentage – 11% in Minnesota, and almost 13% in Iowa. Electric heating is much more common in rented units than owned units: ranging from a low of 25% in Michigan to 45% of units in Iowa. But note – this still leaves a majority of rented units in our states reliant on fossil fuels for heat.

The more common use of electric heating in rental units also correlates [racially](#). Given much higher rental rates among Black people (Figure 5), they also have higher percentages of electricity home heating in the four states – from a low of 18.1% Black-occupied housing units using electric heating in Michigan, to 47.3% in Iowa.<sup>50</sup> However, census data does not distinguish between electric heat pumps and electric resistance heating. Electric resistance heating is significantly more [common](#) than heat pumps, and usually the most [expensive](#) way to heat living space.<sup>51</sup> While there are positives to all forms of electric heating, the cost discrepancy can actually contribute to energy burden for renters.

Propane use, and its burdens, falls [disproportionately in rural areas](#). Propane is usually more expensive than methane natural gas.<sup>52</sup> It also has a higher carbon dioxide emission coefficient when burned.<sup>53</sup> The great majority of propane use in our states is rural: from 76% of propane use in Ohio, to 91.5% in Iowa. It is used to heat a significant percentage of rural households: while under 6% of households in Ohio use propane, more than 20% of rural Ohio households do (an additional 7% of rural households in Ohio use heating oil). More than 36% of rural Minnesotans use propane. Michigan uses more propane in residential buildings than any other state. And [18% of the population in Michigan's Upper Peninsula](#), one of the most rural pockets in the Midwest, uses propane as their primary heating fuel<sup>54</sup>. As a result of less accessible, affordable energy, these areas are [disproportionately energy-burdened](#).<sup>55</sup>

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<sup>49</sup><https://data.census.gov/table?q=home+heating&g=040XX00US19,26,27,39&tid=ACSDTIY2021.B25117&moe=false>

<sup>50</sup><https://data.census.gov/table?q=race&t=-00:001:Race+and+Ethnicity&g=040XX00US19,26,27,39&tid=ACSSPPIY2021.S0201&moe=false>

<sup>51</sup> <https://www.eia.gov/consumption/residential/data/2020/hc/pdf/HC%206.7.pdf>;  
<https://www.forbes.com/home-improvement/hvac/gas-heater-vs-electric-heater/>

<sup>52</sup>

<https://extension.okstate.edu/fact-sheets/true-cost-of-energy-comparisons-apples-to-apples.html>

<sup>53</sup> [https://www.eia.gov/environment/emissions/co2\\_vol\\_mass.php](https://www.eia.gov/environment/emissions/co2_vol_mass.php)

<sup>54</sup>

<https://www.michigan.gov/mpsc/commission/news-releases/2022/07/25/mpsc-urges-propane-customers-to-shop-now#:~:text=Michigan%20uses%20more%20propane%20in,%2C%20and%208%25%20overall%20statewide>

<sup>55</sup> <https://www.aceee.org/sites/default/files/publications/researchreports/u1806.pdf>

## Housing Demographics

Since so much of a focus of efficiency and electrification work is at the residential level, a picture of who lives in what housing is highly relevant. By looking at trends in rentership vs. ownership, housing turnover, and who lives in newer and older buildings, local officials and advocates can better tailor and implement programs to meet communities where they are at.

State	Total Population	White	Black	Indigenous	Asian	Hispanic/Latino (any race)
Ohio	67.2%	73.3%	36%	52.1%	58.4%	45.8%
Iowa	71.9%	74.6%	30.8%	not available	60.6%	56.6%
Michigan	73.2%	79.1%	44.6%	64.8%	64%	62.6%
Minnesota	73%	77.5%	30.5%	52.7%	66.1%	56.6%

*Figure 5. Percent of owner occupied housing units by demographic group. Source: US Census Data*

Across the four states in 2021, around 70% of occupied residential units are [owner-occupied](#), and 30% are renter occupied.<sup>56</sup> Rates of homeownership among the BIPOC (Black, Indigenous & People of Color) populations of these states, however, are drastically lower compared to rates of ownership among white people (Figure 5) .

Of the four states researched, Minnesota and Iowa have the highest inequality between the White and Black owner-occupancy rates. Even in Michigan, with the highest homeownership rates and the lowest discrepancy between racial groups among the four states, there are still pronounced disparities.

<sup>56</sup><https://data.census.gov/table?q=race&t=-00:001:Race+and+Ethnicity&g=040XX00US19,26,27,39&tid=ACSSPPIY2021.S0201&moe=false>

It is also worth noting how much more the BIPOC population [had moved houses in the past year](#) (2020-2021) than the percentage of the population as a whole (Figure 6). It is most pronounced in Iowa, where Black Iowans have changed houses in the past year more than any other racial group in each of the four states.

Percentage of People Living in Same Residence as Previous Year (2020-2021)						
State	Total Population	White	Black	Indigenous	Asian	Hispanic /Latino (any race)
Ohio	87.6%	88.9%	83.1%	85.7%	81.5%	81.5%
Iowa	86.3%	87.4%	75.7%	not available	82.3%	81.5%
Michigan	88.7%	89.3%	88.1%	87.7%	83.8%	85.5%
Minnesota	87.3%	88.2%	83.4%	81.1%	85.4%	83.9%

Figure 6. Percentage of people living in the same residence as previous year. (Source: US Census Data)

While different demographic groups face different levels of same-house residence across states, and even within local jurisdictions, overall people of color experience higher rates of rentership and housing turnover which makes it harder to access, install, advocate for, or benefit from electrification upgrades.

Type of housing also intersects with housing security and how electrification may or may not benefit low-income and BIPOC individuals and families. Over [half a million households in the four states included in this research live in federally subsidized housing](#), but it varies widely across the four states: 147,000 in Michigan, 43,000 in Iowa, 99,000 in Minnesota and 230,000 in Ohio.<sup>57</sup> The design and impact of policies that focus on federally subsidized housing will naturally look different in Ohio than in Iowa.

The [median year housing structures](#) were built is 1970 for Ohio, 1971 for Iowa, 1972 for Michigan, and 1978 for Minnesota.<sup>58</sup> Houses across these states consistently have

<sup>57</sup> <https://www.cbpp.org/research/housing/national-and-state-housing-fact-sheets-data#map>

<sup>58</sup> <https://data.census.gov/table?q=+year+structure+built+ethnicity&t=Year+Structure+Built&g=040XX00US19,26,27,39&tid=ACSDT1Y2021.B25035&moe=false>

[lower values the older they are](#), except that houses built before 1939 have higher median values than those built from 1940-49 in Iowa, Michigan and Ohio.<sup>59</sup> Rents also [tend to be lower](#) in older structures, although less linearly – with the lowest median gross rents across the 4 states occurring in structures built 1970 to 1979.<sup>60</sup>

In Ohio and Michigan, higher rates of black residents live in [older structures](#) (built in 1959 or earlier) compared to white people or the total population. However, In Minnesota there are no immediately obvious racial trends in terms of housing age by race, but unlike Ohio and Michigan, Black people live somewhat more in very new housing (built after 2020), and significantly more in structures built 1960 to 1979, compared to the total population.

In Iowa, more Black and Asian people live in newer structures (14.4% and 18%, respectively, live in structures built 2010 or later) as opposed to White people or the total population. This could be related to mobility and displacement among Black Iowans, although more research is needed.

## Consumer Protections

Energy bills and utilities – and therefore potential changes from upgraded equipment or switching fuel sources, as well – can intersect with housing costs, and contribute to dangerous situations and displacement. There are a few ways that our governments, in addition to basic non-discrimination laws, have attempted to stabilize housing and energy costs for consumers and to protect them from unfair practices.

Rent control is a controversial policy lever that cities use in attempts to stabilize rent prices. Advocates claim that well-designed rent control policies increase the affordability of housing stock, and detractors hold that it can contribute to housing shortages, drive up costs, and benefit primarily high-income individuals. But in most places in the Midwest, it is not currently an option at all: eight of nine RE-AMP States have [some form of rent control preemption](#) in place.<sup>61</sup> Minnesota is the only state where local rent control can legally be implemented.

<sup>59</sup><https://data.census.gov/table?q=rent+by+year+structure+built&t=Year+Structure+Built&g=04OXX00US19,26,27,39&tid=ACSDT1Y2021.B25107&moe=false>

<sup>60</sup><https://data.census.gov/table?q=rent+by+year+structure+built&t=Year+Structure+Built&g=04OXX00US19,26,27,39&tid=ACSDT1Y2021.B25111&moe=false>

<sup>61</sup> <https://www.nmhc.org/research-insight/analysis-and-guidance/rent-control-laws-by-state/>



Most states have some form of energy assistance programs to help stabilize and alleviate the price of energy - Energy Assistance and Home Heating Credits, which use LIHEAP funds to help pay energy and heating bills for low-income households.<sup>62</sup> Percentage of Income Payment Programs (PIPP) are one such program, though somewhat rare among states. A PIPP can help make energy bills more predictable by capping bills based on income. Ohio's PIPP caps bills for program participants at no more than 5% of household income for an electric bill, and 5% for a heating bill, but the percentage can differ significantly by state.<sup>63</sup>

When individuals cannot pay energy bills, shutoff protections can be vital to avoiding the worst outcomes – states have different [protections from shutoff](#) by age, heat, income.<sup>64</sup> Iowa LIHEAP customers have complete protection from Nov. 1st through March 31, and can get a 30 day delay from shutoff if a physician certifies that shutoff would have a negative health impact. Minnesota provides protection between Oct. 1 - April 30, and during excessive heat. They also ban shutoffs if the customer who is unable to pay falls below 50% of the State Median Income, and agrees to a payment plan. Disconnects are also banned in Minnesota if customers have medical certification that their health would be adversely impacted.

Beginning in the first months of the pandemic, 34 states offered their residents full protection against utility shut-offs; [all had expired](#) by the end of 2021.<sup>65</sup> For a period of the pandemic, there was also a federal moratorium on evictions, significantly strengthening the safety net. The moratorium was put in place in September 2020, but [only lasted](#) through August 2021, with an extended moratorium in high-transmission counties through October 2021.<sup>66</sup> It's worth noting that even during periods where residents are protected from shutoffs, bills continue to accumulate, resulting in debts that can become crippling.

Housing status trends between the four states in terms of race track in some instances (rates of home ownership) and diverge in others (median structure age). These may also look different from city-to-city within each state and should be considered when exploring local options for electrification to aid officials in

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<sup>62</sup> See for instance Michigan's Home Heating Credit [option](#) for those at or below the FPL. <https://www.michigan.gov/taxes/questions/iit/accordion/heating/home-heating-credit-information-1>

<sup>63</sup><https://development.ohio.gov/individual/energy-assistance/2-percentage-of-income-payment-plan-plus>

<sup>64</sup> <https://liheapch.acf.hhs.gov/Disconnect/disconnect.htm>

<sup>65</sup>[https://grist.org/climate-energy/energy-equity-elusive-black-latino-indigenous-households/?utm\\_medium=email](https://grist.org/climate-energy/energy-equity-elusive-black-latino-indigenous-households/?utm_medium=email)

<sup>66</sup> <https://nlihc.org/sites/default/files/Overview-of-National-Eviction-Moratorium.pdf>

understanding who might be left out explicitly or unintentionally and who should be engaged in program design and implementation. Additionally, electrification efforts can be accompanied by energy bill assistance and shut off protections to make the transition cost affordable and feasible for energy burdened households.

## Clean Energy Requirements

Commitments to reducing GHG emissions, and clean energy mandates in particular, are important background to electrification efforts. First, overarching carbon neutrality or clean energy goals and plans can get the ball rolling on more sector-specific action, like building efficiency and electrification. Second, transitioning to renewable energy for electricity generation is necessary in order to amplify the benefit of building electrification. While some benefits can come from electrification itself, the majority of emissions reductions rely on renewable energy as the fuel source for electricity. That way, electrification will come with significant, true emissions reductions, not just a movement of emissions away from buildings.

## Statewide Clean Energy Policy and GHG Reduction Targets

<u>Clean Energy + GHG by State</u>				
	Ohio	Iowa	Michigan	Minnesota
GHG Reduction Target (Year Set)	N/A	Required reporting, no reduction target (2007)	Carbon neutrality by 2050 (2020)	50% GHG reduction by 2030, net-zero by 2050 (2022)
RPS for Renewable-Generated Electricity Sold by Utilities	8.5% by 2026 (2019)	Minimum 105 MW (1983)	35% by 2025 (2016)	55% by 2035 (2023)
Percentage of In-state Electricity Generated from Renewables*	4.7%	66.1%	12.9%	34.1%

\*Renewables here includes conventional hydroelectric, wind, solar, and other renewables.

Sources:  
 Ohio: <https://www.legislature.ohio.gov/legislation/133/hb6>  
 Iowa: <https://www.iowadnr.gov/environmental-protection/air-quality/greenhouse-gas-emissions>  
 Michigan: <https://www.michigan.gov/whitmer/news/state-orders-and-directives/2020/09/23/executive-directive-2020-10>  
 Minnesota: <https://www.pca.state.mn.us/climate-action-framework>

Figure 7. Statewide Clean Energy Targets, Requirements and Characteristics.

## Utility Clean Energy and GHG Goals

In addition to statewide targets and mandates, utilities often have individual clean energy targets and GHG reduction plans. See Appendix A for more on statewide Clean Energy Policy and GHG Reduction Targets.

<u>Investor-Owned Utility Clean Energy Targets</u>				
	AEP	Mid-American	DTE	Xcel
Clean Energy Target	50% renewable energy by 2030	100% Renewable Energy by 2050	Net-zero energy by 2050, 50% renewable by 2035	Carbon-free energy by 2050
GHG Reductions	80% Scope 1 Emissions Reduction from 2005 baseline by 2045	N/A	Reduce emissions 30% by 2030 and 90% by 2040	Reduce emissions 80% by 2030

Figure 8. Select IOU Clean Energy and GHG Reduction Targets (Leading from the Heartland, RE-AMP, 2021)

According to a RE-AMP report from 2021, [at least 32 out of 49](#) Investor Owned Utilities (IOUs) in the RE-AMP region have made some form of greenhouse gas reduction commitment.<sup>67</sup> See Appendix B for details on Utility Clean Energy and GHG Goals for Investor Owned Utilities and other utilities.

## Local Clean Energy Targets

To understand the full scope of clean energy targets in the US, we want to recognize that [over 200 cities and counties](#) in the US have set commitments to achieve 100%

<sup>67</sup> <https://www.reamp.org/wp-content/uploads/2021/11/Leading-from-the-Heartland.pdf>. This figure might not even include every IOU with a commitment to date

carbon neutrality, including many in the Midwest.<sup>68</sup> Local commitments can be set in various ways, most commonly through climate plans or city ordinances. There is also some range in the goals and language of local targets themselves – some are sector-wide, some just about electricity generation. They present a range of timelines, and there are also differences as to whether they commit to fully renewable energy, or net-zero or clean energy. Some examples are the 24/7 Clean Energy ordinances in Des Moines and Waterloo, IA, the 100% Renewable Energy goals in Minneapolis and Cincinnati, and the 100% Clean Energy goal in Cleveland. Local Case Studies (Appendix C) in the next phase of research will supplement our discussion of local action with more detail.

### Franchise Agreements

Franchise agreements can be a useful tool for local governments to push utilities to be more aligned with their values. A 2019 [dataset from the National Renewable Energy Laboratory](#) (NREL) showed that 775 (531 of which are in the 4 states focused on in this research) municipalities in RE-AMP states have negotiated franchise agreements with their utility.<sup>69</sup> 4 agreements reference 100% clean energy targets, 7 reference renewable energy more broadly, and 64 reference energy efficiency.

An exception in the Midwest is in Michigan where it is effectively impossible to negotiate a new franchise or change utility service provider. A 1905 law, known as the Foote Act, made permanent any electric utility franchise agreement that had been granted by a local government.<sup>70</sup> This means utilities are allowed to use whatever public property necessary without needing a franchise approved by the local municipality.<sup>71</sup> There are some exceptions, but many municipalities, including Ann Arbor, are unable to switch utility providers, thereby stripping them of significant franchise renegotiation leverage that might force the IOU to change policy and service practices. Franchise agreements still exist and municipalities may try to negotiate the terms of those agreements, but the Foote Act allows utilities to operate largely on their own terms. The only alternative for some municipalities is to “buy back the grid” and form a municipally owned utility which carries its own financial and procedural barriers.

<sup>68</sup><https://innovation.luskin.ucla.edu/wp-content/uploads/2019/11/100-Clean-Energy-Progress-Report-UCLA-2.pdf>

<sup>69</sup> <https://www.nrel.gov/solar/market-research-analysis/municipal-franchise-agreements.html>

<sup>70</sup>

[https://www.a2gov.org/departments/sustainability/Sustainability-Me/Documents/A2\\_Sustainable\\_Energy\\_Report\\_2021\\_v7.pdf](https://www.a2gov.org/departments/sustainability/Sustainability-Me/Documents/A2_Sustainable_Energy_Report_2021_v7.pdf)

<sup>71</sup>

<https://detroitmi.gov/sites/detroitmi.localhost/files/2021-04/Detroit%20Solar%20Policy%20Guide%20State%20Level%2003.09.19.pdf>

# **Energy Efficiency and Weatherization**

Using less energy to heat and cool our homes or make our meals, in addition to changing what fuel we use, is a necessary part of the energy transition as it reduces the load on a grid that will bear more electricity demand.

## **Statewide Policy and Programs**

Support for energy efficiency can come through multiple local, state, and federal channels including assistance programs, energy saving targets, and efficiency mandates (Figure 9). For more details on State Requirements and Programs on Energy Efficiency and Weatherization, see Appendix D. For more on Utility Programs for Energy Efficiency and Weatherization see Appendix E.

<u>Statewide Energy Efficiency</u>				
	Ohio	Iowa	Michigan	Minnesota
Energy Efficiency Resource Standards (Source, Year Set)	Deleted the annual energy savings requirement for electric utilities. (HB 6, 2019)	Utilities required to make energy efficiency plans (SF 2386, 2008)*	1% of annual sales for electric, 0.75% for gas (Public Act 342, 2016) **	1.75% annual sales for electric IOUs, 1.5% for Municipal and Co-ops, 1% for gas ( HF 164, 2021)
Benchmarking (Source)	Required (2006) for public buildings, with mandatory reductions over 4 years. (EO 2007).	Voluntary program for public buildings. Local benchmarking is preempted and voided. (ia.b3benchmarking.com)	N/A	Required (2001) for all public buildings for one year, Required (2019) monthly for public schools. (mn.b3benchmarking.com)
State Building Codes (Year Adopted) Source: ACEEE	Residential based on 2018 IRC/IECC, Commercial 2012 IECC (2019)	Res. and Comm. 2012 IECC	Res. and Comm. weakened 2015 IECC (2016) Both in process of update to 2021 IECC	Res. 2012, Comm. 2018 IECC (2020)
LIHEAP Annual Income Eligibility (For Household of 1) Source: Benefits.gov	175% FPL (\$23,782.5)	200% FPL (\$27,180)	150% FPL (\$21,870)	60% SMI (\$36,687)
WAP Eligibility (Dollars) Source: Benefits.gov	200% FPL (\$27,180)	200% FPL (\$27,180)	200% FPL (\$29,160)***	60% SMI (\$36,687)
<p><i>*In 2018, SF 2311 in Iowa set spending caps for utility energy efficiency and demand response programs at 2% of revenue for electric utilities and 1.5% for gas.</i></p> <p><i>** The Michigan Public Service Commission has the authority to approve plans with higher or lower energy savings than 1% of sales.</i></p> <p><i>*** Discrepancy in listed income for 200% of FPL is based on whether states have updated to list 2023 FPL, or currently use the 2022 FPL in calculating</i></p>				

Figure 9. Relevant Statewide Efficiency Programs and Policy

### Common Low-Interest Energy Efficiency Financing Mechanisms

[Property Assessed Clean Energy \(PACE\)](#)<sup>72</sup> “is a financing mechanism that enables low-cost, long-term funding for energy efficiency, renewable energy and water conservation projects.” PACE financing [needs to be enabled](#) by state legislatures,

<sup>72</sup> [https://www.pacenation.org/wp-content/uploads/2016/10/PACEBasics\\_2016\\_10\\_7.pdf](https://www.pacenation.org/wp-content/uploads/2016/10/PACEBasics_2016_10_7.pdf)

and requires further authorization by local governments.<sup>73</sup> California introduced the first statewide program in 2008, and since then many states have passed PACE legislation and have active programs. Ohio, Michigan, and Minnesota all offer C-PACE, or Commercial Property Assessed Clean Energy. PACE programs use non-governmental funds, cover 100% of upfront cost, and are repaid over 15-25 years. Cost recovery is through an increased property tax attached to the property, not the individual, and can be passed through to lease. The process for applying, including the [initial eligibility form](#)<sup>74</sup> is not extremely transparent, and is based on property, mortgage, and property tax history. [No audit is required.](#)<sup>75</sup> There are concerns that the program is [lacking in consumer protections.](#)<sup>76</sup>

Green banks offer private funding to fill financing gaps with lower-interest, longer-term options. [Michigan Saves](#)<sup>77</sup> was the “nation’s first non-profit green bank,” and over a decade of financing has provided [more than \\$300 million in investments.](#)<sup>78</sup> In 2020, Growth Opps, based in Cuyahoga County, Ohio, launched the [first Black-led Green Bank.](#)<sup>79</sup> In 2023 [Minnesota passed legislation to start a green bank known as the Minnesota Climate Innovation Finance Authority](#)<sup>80</sup> with \$45 million dollars. There is [\\$27 billion in the Inflation Reduction Act](#)<sup>81</sup> for the Environmental Protection Agency’s new Clean Energy Fund, with \$20 billion meant to leverage climate investments and launch green banks and \$7 billion meant to be targeted to low income communities. While green banks can be a useful tool, particularly for commercial financing, their impact to date has been limited, with [small market penetration for residential loans](#), and mostly for those with prime and beyond credit scores.<sup>82</sup>

## Equity in Efficiency and Weatherization

Energy efficiency must happen in tandem with electrification to reduce energy burden and ensure comfortable homes. Weatherization, which refers to a series of

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<sup>73</sup> [https://www.energy.gov/sites/default/files/2017/10/f39/FL1710\\_WIP\\_CPACEv2.PDF](https://www.energy.gov/sites/default/files/2017/10/f39/FL1710_WIP_CPACEv2.PDF)

<sup>74</sup> [https://ohpace.org/wp-content/uploads/2020/06/OHPACE\\_Initial\\_Eligibility\\_Form.pdf](https://ohpace.org/wp-content/uploads/2020/06/OHPACE_Initial_Eligibility_Form.pdf)

<sup>75</sup> [https://ohpace.org/wp-content/uploads/2020/06/OHPACE\\_Brochure.pdf](https://ohpace.org/wp-content/uploads/2020/06/OHPACE_Brochure.pdf)

<sup>76</sup> <https://www.dsireinsight.com/blog/2021/10/26/what-happened-to-pace-financing>

<sup>77</sup> <https://michigansaves.org/>

<sup>78</sup> <https://dcgreenbank.com/wp-content/uploads/2021/05/2021AnnualIndustryReportFinal.pdf>

<sup>79</sup> <https://www.growthopps.org/go-green/>

<sup>80</sup> [https://www.mprnews.org/story/2023/05/18/state-lawmakers-agree-to-historic-environment-and-climate-bill?utm\\_medium=email](https://www.mprnews.org/story/2023/05/18/state-lawmakers-agree-to-historic-environment-and-climate-bill?utm_medium=email)

<sup>81</sup> [https://news.bloomberglaw.com/environment-and-energy/green-banks-spring-up-in-states-spurred-by-27-billion-fund?utm\\_medium=email](https://news.bloomberglaw.com/environment-and-energy/green-banks-spring-up-in-states-spurred-by-27-billion-fund?utm_medium=email)

<sup>82</sup> <https://www.youtube.com/watch?v=k-QVUYzjdVo&t=546s>

home and building improvements that make heating and cooling more effective, is one key program that provides low-income households with needed retrofits. Interventions like air sealing, insulation, moisture control, and ventilation can reduce the energy burden of low-income households by about [25%](#).<sup>83</sup>

However, more urgent interventions and upgrades, such as removing asbestos, lead, vermiculite, and mold are required in buildings *before* energy efficient retrofits. These *pre-weatherization* [improvements](#) yield important health benefits – a core tenant of equitable deep decarbonization.<sup>84</sup> Policies must account for that.

Broadly, energy efficiency assistance is a huge need but there are too few programs, too little funding, and too few workers. Plus, eligibility requirements and deferrals, especially for weatherization, can leave out a large swath of the low-income residents these programs aim to serve. ACEEE states that for more than one in three households that rent, making improvements is difficult or prohibited.<sup>85</sup> Federal rules for WAP and LIHEAP exclude [“non-qualified”](#) immigrants in single dwelling units, but include anyone, regardless of immigration status, if they live in multi-family dwellings.<sup>86</sup> Some state programs, such as MN Energy Assistance, explicitly say that they are available to non-citizens, but this clarification or guidance is not easily found for other state programs.

Even if a household meets all income requirements for weatherization, if it needs pre-weatherization too then the household will be ruled ineligible until pre-weatherization is complete. In Minnesota, [50% of eligible weatherization](#) applicants are deferred because they need pre-weatherization. A study found that only [8 to 12% of eligible applicants](#)<sup>87</sup> end up benefiting from the program. These challenges point to gaps in inclusive program design and transparency in addition to other challenges such as state capital, agency capacity, and availability of labor. Access to these programs is even more difficult for renters and those changing residence more often, who, as demonstrated earlier, are disproportionately BIPOC.

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<sup>83</sup>

[https://www.michigan.gov/-/media/Project/Websites/mpsc/workgroups/eaac/aceee\\_energy\\_burden\\_report\\_2020.pdf?rev=24565d21283d4b70993a6050c80513d4](https://www.michigan.gov/-/media/Project/Websites/mpsc/workgroups/eaac/aceee_energy_burden_report_2020.pdf?rev=24565d21283d4b70993a6050c80513d4)

<sup>84</sup>

<https://www.health.state.mn.us/communities/environment/asbestos/homeowner/heffects.html#:~:text=If%20you%20breathe%20asbestos%20fibers,digestive%20system%2C%20including%20colon%20cancer.>

<sup>85</sup> <https://www.aceee.org/energy-equity-for-renters>

<sup>86</sup> [https://www.nilc.org/wp-content/uploads/2016/03/liheapwap\\_pp150-51\\_053006.pdf](https://www.nilc.org/wp-content/uploads/2016/03/liheapwap_pp150-51_053006.pdf)

<sup>87</sup> <https://www.house.mn.gov/comm/docs/AdTO6m9X-0ud9QrYAmbmaA.pdf>



## Inclusive Financing

On-bill financing run through utilities, including the [Pay As You Save® \(PAYS\) model](#), can offer an opportunity for low-to-moderate income (LMI) households to afford efficiency upgrades.<sup>88</sup> In [the PAYS model](#), the utility implements efficiency upgrades for owners or renters, which are then paid back with a tariff on the customer's energy, limited to 80% of the expected annual savings.<sup>89</sup> On-bill financing is authorized in Iowa, Michigan and [Minnesota](#), although not the PAYS model itself.<sup>90</sup>

There is also a [gap between funding and financing options for energy efficiency upgrades](#)<sup>91</sup>—one in eight Michigan households are ineligible for both low-income programs and credit-based loans. Low-income consumers do not always receive equitable benefits from efficiency programs. A study on Michigan utilities found that low-income consumers overall received 10 times less home *electric* energy savings and 3.4 times less home *gas* energy savings when compared to high-income consumers. The greatest difference found, by utility, was 22 times higher. The [gap between actual low-income investment and investment that met the mark for equity](#)<sup>92</sup> was significantly smaller for gas than for electric. Black and Latinx neighborhoods are on average less efficient than White neighborhoods but maintain lower emissions, creating an [emissions paradox](#):<sup>93</sup> neighborhoods with more energy efficient homes actually have *higher* emissions than neighborhoods with fewer energy efficient homes. Efficiency programs that are targeted at houses and appliances with the highest energy costs direct investments towards bigger houses and bigger appliances.

## Climate Potential of Energy Efficiency

The climate potential of weatherization and energy efficiency is significant. According to the International Energy Agency (IEA), energy efficiency represents

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<sup>88</sup> <https://www.mwalliance.org/sites/default/files/meea-research/on-bill-fact-sheet-11.5.18.pdf>

<sup>89</sup> <https://slipstreaminc.org/blog/pay-as-you-save-home-retrofits>

<sup>90</sup>

<https://energynews.us/2020/08/10/minneapolis-seeks-inclusive-financing-for-energy-efficiency-improvements/>

<sup>91</sup> <https://www.youtube.com/watch?v=k-QVUYzjdVo&t=546s>

<sup>92</sup>

<https://assets.ctfassets.net/ntcn17ss1ow9/64aWq4MgVXhtHRkAnYDGXL/54154aba566798d6e7059be213f01fce/equity-in-energy-efficiency-investment-and-savings-report-2017.pdf>

<sup>93</sup> <https://www.sciencedirect.com/science/article/pii/S2214629621004552>

[more than 40% of global emissions reduction needed by 2040](#).<sup>94</sup> ACEEE estimated that increasing US appliance standards, building codes and standards, and more aggressive utility Energy Efficiency Resource Standards (EERS) could [cut more than 16% of nationwide energy CO2 emissions by 2050](#).<sup>95</sup> In the National Resource Defense Council's emissions modeling done with E3's PATHWAYS tool, commercial and residential building efficiency [accounts](#) for more than 1,000 million metric tons of CO2 reductions<sup>96</sup> – about 20% – by 2050. While efficiency is often thought of in terms of a more efficient version of the appliance running on the same type of fuel, switching from fossil fuel-powered appliances to high-efficiency electric appliances, including heat pumps and induction stove tops, makes for huge gains in efficiency. Combined with weatherization and other efficiency steps, the impact is maximized, and avoids locking in additional fossil fuel infrastructure. Pre-weatherization and weatherization in particular are necessary for grid load management, reducing cost, and maximizing benefits of new all-electric appliances. However, as we will see in the coming section, old language and structures in efficiency legislation, as in Michigan, actually can make beneficial electrification more difficult. Without updates, the two objectives can be caught at cross-hairs.

## Fuel Switching

The move towards cleaner, more efficient and cheaper heating in America is not a new one. The country has undergone [several fuel transitions](#) – in 1940, three in four homes used coal or wood for heating. In 1960, 1.8% of homes used electric heating and by 1990, over a quarter did. Use of methane gas and propane grew rapidly between 1940 and 1970.<sup>97</sup> Government support for the production and supply of various fuels has been important and complex, but is outside the scope of this research. On the demand side, consumers always retain the right to upgrade their homes and personally *fuel-switch*—for example, swapping out a gas stove for an induction range. However, regulation has not always promoted, or even permitted, utility-scale programs to increase the use of one fuel over another.

Energy efficiency policies have [historically considered fuel types in isolation](#) and have sometimes restricted fuel-switching in buildings.<sup>98</sup> In Minnesota, as a part of instituting efficiency legislation, the Commerce Department in 2005 [prohibited the inclusion of fuel-switching](#) programs. In 2012 they carved out an exception for electric space and water heating for low-income customers, in conjunction with WAP. Only

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<sup>94</sup>

<https://www.iea.org/commentaries/how-energy-efficiency-will-power-net-zero-climate-goals>

<sup>95</sup> <https://www.aceee.org/sites/default/files/publications/researchreports/u1907.pdf>

<sup>96</sup> <https://www.nrdc.org/sites/default/files/americas-clean-energy-frontier-report.pdf>

<sup>97</sup> <https://www.census.gov/data/tables/time-series/dec/coh-fuels.html>

<sup>98</sup> [https://www.aceee.org/sites/default/files/pdfs/fuel\\_switch\\_revised\\_5-14-20.pdf](https://www.aceee.org/sites/default/files/pdfs/fuel_switch_revised_5-14-20.pdf)

later on did the ECO Act explicitly include efficient fuel-switching as a part of energy savings.<sup>99</sup> Prohibitive regulations have also sometimes made exceptions to enable switching from unregulated fuel sources to regulated ones, or even for electric-to-gas but not gas-to-electric.

Given the tension between utility profits and public interests, fuel-switching has not always been a politically straightforward venture. The [2020 ACEEE State Policy brief](#) indicates a trend picking up in 2018 of states recognizing fuel-switching and beneficial electrification as valuable, and taking measures to change their rules and legislation to enable it. This began with Vermont including electrification and fuel-switching as part of their Renewable Energy Standard in 2015, followed by Alaska, New York, Massachusetts and Connecticut incorporating fuel-switching supportive policies or guidelines in 2018, California, Tennessee, New Jersey, and Maine in 2019, and more since then.

## Statewide Policy

The states included in this research span a range of legislative realities for fuel-switching, though none expressly prohibit it.

In **Minnesota**, the paradigm shifted with the passing of the [ECO Act](#) in 2021.<sup>100</sup> As mentioned above, the ECO Act overhauled the previous efficiency legislation. In addition to increasing the general utility energy savings goals, it specifically includes efficient fuel-switching in potential efficiency programs. Up to .35% of an IOU's 1.75% gross annual sales energy savings goal, and .55% of the 1.5% of consumer-owned utilities' energy-savings goal can come from efficient fuel-switching improvements. The ECO Act outlines that to qualify as efficient fuel-switching, it must demonstrate that on a fuel-neutral basis, it results in a net reduction of source energy consumed for a particular use, and that it is resulting in a reduction of GHG emissions. It also requires that fuel-switching be cost-effective, from the perspective of the utility, participants, and society.

At the same time, the MN [Natural Gas Innovation Act](#) (2021) allowed utilities to file an "innovation plan" with the public service commission. As a part of the innovation plan, any gas utility with more than 800,000 customers must include a pilot program to facilitate "deep energy retrofits and the installation of cold climate electric

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<sup>99</sup> <https://mn.gov/commerce-stat/pdfs/card-michaels-electrification.pdf>

<sup>100</sup> [https://www.revisor.mn.gov/bills/text.php?number=HF164&type=bill&version=2&session=ls92&session\\_year=2021&session\\_number=0](https://www.revisor.mn.gov/bills/text.php?number=HF164&type=bill&version=2&session=ls92&session_year=2021&session_number=0)

air-source heat pumps with methane gas backups in existing residential homes that have methane gas heating systems.”<sup>101</sup>

This year, the Minnesota [Environment Omnibus Bill](#) included \$13 million for grants and rebates for electric heat pumps and \$6.5 million for electric panels to help people add electric appliances, further supporting fuel-switching efforts.<sup>102</sup>

In **Michigan**, standing [energy efficiency legislation](#) requires electric providers to achieve 1% annual savings relative to the preceding year, and .75% for methane gas providers.<sup>103</sup> Neither target explicitly favors or prohibits fuel-switching, but an American Council for an Energy Efficient Economy (ACEEE) [report](#) explains that the method of counting savings does effectively create a barrier to efficient fuel-switching. ACEEE notes that the law “requires utility providers to actively reduce their annual usage as a percentage of the previous year’s sales, which is understood to preclude adding load through electrification. As such, utilities have generally avoided using ratepayer-funded energy efficiency collections for fuel switching, particularly for gas to electric.”<sup>104</sup> Conversions from wood, propane or heating oil to methane gas or electric may qualify as exceptions, with savings calculated according to the difference between energy use between fuels.<sup>105</sup> New proposed legislation in 2023–Energy Waste Reduction Rewrite HB4761– would address this barrier, but passage is not expected this year.

Neither **Iowa** nor **Ohio** has policy in place relevant to fuel-switching or substitution.<sup>106</sup>

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<sup>101</sup>[https://www.revisor.mn.gov/bills/text.php?number=SF421&version=latest&session=ls92&session\\_year=2021&session\\_number=0](https://www.revisor.mn.gov/bills/text.php?number=SF421&version=latest&session=ls92&session_year=2021&session_number=0)

<sup>102</sup>

[https://www.mprnews.org/story/2023/05/18/state-lawmakers-agree-to-historic-environment-and-climate-bill?utm\\_medium=email](https://www.mprnews.org/story/2023/05/18/state-lawmakers-agree-to-historic-environment-and-climate-bill?utm_medium=email)

<sup>103</sup> <http://www.legislature.mi.gov/documents/2015-2016/publicact/pdf/2016-PA-0342.pdf>

<sup>104</sup>[https://www.aceee.org/sites/default/files/pdfs/state\\_fuel-switching\\_policies\\_and\\_rules\\_7-21-22.pdf](https://www.aceee.org/sites/default/files/pdfs/state_fuel-switching_policies_and_rules_7-21-22.pdf)

<sup>105</sup>[https://www.aceee.org/sites/default/files/pdfs/state\\_fuel-switching\\_policies\\_and\\_rules\\_7-21-22.pdf](https://www.aceee.org/sites/default/files/pdfs/state_fuel-switching_policies_and_rules_7-21-22.pdf)

<sup>106</sup> See above.

## Utility Fuel-Switching Programs

<u>Utility Electrification Offerings</u>						
	AEP	Mid-American	DTE	Xcel	Cherryland	Cedar Falls
Heat Pump and Electric Water Heater Rebates	N/A	Up to \$600, 50% of installed cost for heat pumps	Rebates only available when replacing electric appliances	Up to \$600 for heat pumps, and \$500 for electric water heaters	Up to \$1,500 for an air source heat pump*, up to \$500 for a heat pump water heater	Up to \$600 for heat pumps, \$400 for electric water heaters
Electrification Advice or Consults	Contact info for Energy Advisors, Electrification Planning Sheet, and Directory of Contractors	N/A	Quiz and website explaining heat pumps	N/A	N/A	N/A
Reduced Home Heating Electric Rate	N/A	N/A	Yes – "Cool Currents" Program	Yes – "Heating Upgrade" Rates	Yes – dual meter program with 3¢ rate reduction for heat pumps	Winter electric rate builds in about a 10% rate reduction for heating
Source:	<a href="https://www.aepohio.com">https://www.aepohio.com</a>	<a href="https://www.midamericanenergy.com">https://www.midamericanenergy.com</a>	<a href="https://www.dteenergy.com/us/en/">https://www.dteenergy.com/us/en/</a>	<a href="https://mn.my.xcelenergy.com">https://mn.my.xcelenergy.com</a>	<a href="https://cherrylandelectric.coop">https://cherrylandelectric.coop</a>	<a href="https://www.cfu.net">https://www.cfu.net</a>

*\*Provided the home did not have any prior central air-conditioning*

Figure 10. Relevant Utility Electrification Offerings Investor-Owned Utilities

For more details on these types of programs, see Appendix F.

### Federal Support for Electrification and Efficiency

Federal support for electrification, particularly in the form of rebates and tax credits from the IRA and IIJA, can make a huge difference in incentivizing electrification. Take for example, the [Energy Efficiency Program for Ohio Communities](#), which was implemented with IIJA money and provides grant funding to install efficiency

measures that reduce energy by at least 15%. A [Vox analysis](#) of IRA opportunities for renters points out that tax credits only are beneficial to those with enough federal taxes to make the offset relevant. But home electrification and appliance rebates, as well as home efficiency rebates, which are point-of-sale discounts, can provide key financing for low and medium income individuals, and especially renters.<sup>107</sup> Specifically, the High-Efficiency Electric Home Rebate Program [can provide](#) up to \$8,000 as a point-of-sale discount on Heat Pumps, up to 100% cost for those below 80% of the Area Median Income, and up to 50% of cost for those between 80-150% of AMI.<sup>108</sup> However, the availability of rebate funds and the ways they can be stacked depend on state implementation, which is [still getting off the ground](#) in the latter half of 2023.<sup>109</sup>

## Equity Issues for Fuel Switching

Electrification that is truly beneficial has the opportunity to alleviate inequities, including in air quality, health outcomes, and energy burden. However, there are several potential issues in promoting and implementing fuel-switching that require our attention.

The first issue that can come up in advocating for electrification lies in how we estimate potential cost savings between fuels. Relative costs are locally determined, and in our states, the higher price per unit of energy for electricity relative to methane gas might make consumers wary of electrifying and raising their electricity bills. Particularly for the already energy-burdened, the economics of fuel-switching are vital: and without electrification-supportive heating rate structures, the cost of electric heating (even with cold-climate air source heat pumps making it technologically feasible) is often restrictive in cold climates.

More research needs to be done into the price of fuel-switching from gas to electric, particularly for upgrades and retrofits. An [RMI report on the economics](#) of beneficial electrification showed that even where electricity costs are significantly more per unit energy than methane gas, such as Minneapolis and Columbus, building all-electric can end up lowering annual utility bills.<sup>110</sup> However, the analysis only calculates the cost savings for new construction.

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<sup>107</sup><https://www.vox.com/climate/2023/4/7/22954507/inflation-reduction-act-renters-home-rebates>

<sup>108</sup>[https://assets.ctfassets.net/v4qx5q5o44nj/7LiHS6hhVKaldph8bdVV8b/aec9fc3a35985027af3f97111304db7a/factsheet\\_Electrification\\_Rebates.pdf](https://assets.ctfassets.net/v4qx5q5o44nj/7LiHS6hhVKaldph8bdVV8b/aec9fc3a35985027af3f97111304db7a/factsheet_Electrification_Rebates.pdf)

<sup>109</sup> <https://www.energy.gov/scep/home-energy-rebate-programs-frequently-asked-questions>

<sup>110</sup> [https://rmi.org/wp-content/uploads/dlm\\_uploads/2020/10/eeb\\_all\\_cities.pdf](https://rmi.org/wp-content/uploads/dlm_uploads/2020/10/eeb_all_cities.pdf)

In addition to the price of energy itself, fuel-switching retrofits share some of the same complications as energy-efficiency upgrades. Even with rebates, upfront costs of fuel-switching can pose a challenge. And in a multifamily context, renters might not have the freedom to replace appliances, let alone the whole heating system. The burden of electrification then rests on landlords – who have split incentives, as they do not pay for utilities, and might [pass through electrification costs](#) and share them with renters who cannot afford the cost of renovations.<sup>111</sup> In the worst case, this can lead to displacement.

In places where shutoffs and reliability are significant concerns with electricity service, electrification can amplify those concerns. Plans for increased electrification ought to be combined with overall improvements and solutions to the inequities of our current electric system. Improving the infrastructure, service quality, and repair times for disadvantaged communities, is critical in any vision of equitable electrification. As people increasingly switch from gas service to electric and the gas customer base shrinks, it is also important to guard against [rising rates for those remaining](#) on gas service.<sup>112</sup>

Another challenge with electrification is that, in many cases, expenses that are now spread across multiple bills will be consolidated into one. While that may prove convenient for anyone who is consistently able to pay all their bills in full each month, it can be a challenge for households who are often forced to “rob Peter to pay Paul.” If a heating bill is so overdue that disconnection is threatened, a family might skip paying their electric bill to cover the gas for a couple of months, for example. But under consolidation, financial pressure will mount on a single bill--increasingly so as transportation also becomes electrified.

As demonstrated in the utility programs above, fuel switching from wood, heating oil and propane provides a unique challenge and opportunity. Some utilities in our states are expanding methane gas infrastructure to meet rural, propane-dependent communities and claiming this as an improvement in energy efficiency such as [DTE's low-carbon grant](#) program (see Appendix F for details).

As a final note, with large infusions of cash going toward electrification, there is a tremendous amount of work to do overseeing its implementation – both for process and distribution. In December 2022, The Greenlining Institute, ReWiring America, and others [requested a longer comment period](#) from the DOE on how to distribute \$250 million of IRA funds for heat pumps, including a focus on prioritizing the

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<sup>111</sup> <https://www.saje.net/building-decarbonization/>

<sup>112</sup> <https://greenlining.org/2020/natural-gas-bans-national-can-cities-fill-gap/>



Justice40 initiative when distributing funds. As of April 2023, DOE had not announced new plans for disbursement of those funds.<sup>113</sup>

## Climate Potential of Fuel-Switching

Fuel-switching can be [difficult to incentivize](#) – sometimes even more than other efficiency retrofits. Often people only upgrade when something is broken, and upgrading to a system reliant on a different fuel is a more complicated and longer process.<sup>114</sup> However, from a climate perspective particularly, we can understand how immediate the transition to electric needs to be. According to a 2018 report from the McKnight Foundation, to reach just an 80% carbon reduction by 2050, Minnesota would need to electrify [more than](#) 70% of its residential space and water heating, and more than 60% for the commercial sector.<sup>115</sup> To reach anywhere near 60% or 70% reductions, retrofits for existing buildings are essential.

## Local Fossil Fuel Restrictions and State Preemptions

Berkeley, CA, was the first to pass a methane gas ban for residential and commercial hookups in new buildings in 2019. Since then, [74 Californian cities and counties](#)<sup>116</sup> have passed new building electrification policies, some based on protecting local health and safety, like Berkeley's, but more often through changes to building codes. In May 2023, Oak Park, Illinois became the first Midwest city to pass a local ordinance prohibiting fossil fuels in new constructions. Policies have also passed in other cities, including New York City; Vancouver, BC; [Eugene, OR](#)<sup>117</sup>; and [Denver, CO](#)<sup>118</sup>. Washington State has also passed statewide building codes to make space and water heating all-electric in new residential and commercial construction (though enforcement is paused to adapt the codes to the new Ninth Circuit ruling, more on

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<sup>113</sup> <https://www.eenews.net/articles/how-bidens-environmental-justice-plan-is-changing-doe/>

<sup>114</sup> [https://www.usdn.org/uploads/cms/documents/city-utility\\_building\\_electrification\\_primer\\_final\\_pdf.pdf](https://www.usdn.org/uploads/cms/documents/city-utility_building_electrification_primer_final_pdf.pdf)

<sup>115</sup> [https://www.mcknight.org/wp-content/uploads/Minnesotas-SmarterGrid\\_FullReport\\_NewFormat.pdf](https://www.mcknight.org/wp-content/uploads/Minnesotas-SmarterGrid_FullReport_NewFormat.pdf)

<sup>116</sup> <https://www.sierraclub.org/articles/2021/07/californias-cities-lead-way-pollution-free-homes-and-buildings>

<sup>117</sup>

<https://energynews.us/2023/02/08/oregon-citys-gas-ban-marks-continued-spread-across-the-west/>

<sup>118</sup>

[https://denvergazette.com/news/business/denver-imposes-natural-gas-ban-on-heating-cooling-equipment-in-commercial-buildings-multi-family-housing/article\\_e8a5352c-b6f1-11ed-b6f5-2bbe6c6ff924.html](https://denvergazette.com/news/business/denver-imposes-natural-gas-ban-on-heating-cooling-equipment-in-commercial-buildings-multi-family-housing/article_e8a5352c-b6f1-11ed-b6f5-2bbe6c6ff924.html)

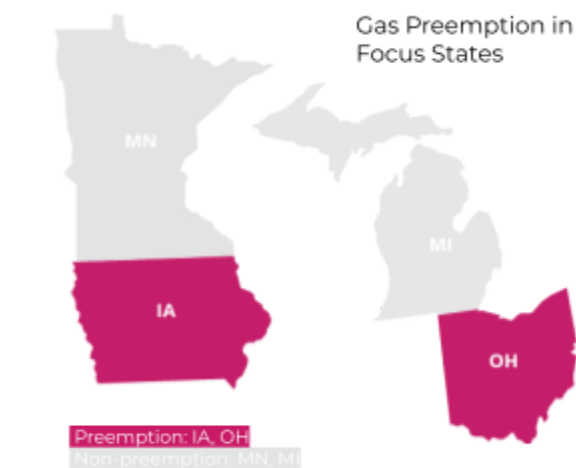


this below) and New York passed the first statewide all-electric law in 2023. New York City and Vancouver, BC, have also passed policies on electrification of existing buildings and Seattle is considering a policy in 2023.

Seeing the growth of local prohibitions of methane gas in buildings, [methane gas interest groups began pushing “preemption” bills](#),<sup>119</sup> which take away local authority to pass policies to keep gas out of buildings. Preemption was pushed in states with [Republican-controlled legislatures across the country in 2020 and 2021](#)<sup>120</sup>. Twenty states currently have preemption legislation against methane gas restrictions. Sixty percent of the highest gas-consuming states in the US (9 out of top 20), and [80% of the highest gas-producing states](#)<sup>121</sup> (13 out of top 20<sup>122</sup>) are “preemption states.”

Most recently, Berkeley’s 2019 methane gas ban was struck down by a three-judge panel of the [Ninth Circuit Court of Appeals court](#). The ruling claimed the law was illegal under the Energy Policy and Conservation Act which the judges said “expressly preempts” state and local restrictions on gas appliances’ energy use. The case was brought by the California Restaurant Association with financial support from the gas industry. Berkeley has asked for a review of the decision by the full court. The ruling might have a chilling effect—it has paused enforcement of Washington state’s new building codes– but it only applies within the Ninth Circuit and potentially leaves open pathways through building codes.

## State Policy



*Figure 11. Preemption of Local Gas Hookup-Prevention Ordinances in Focus States*

<sup>119</sup> <https://www.vox.com/22691755/gas-utilities-fight-electrification-preemption>

<sup>120</sup>

<https://www.cnn.com/2022/02/17/politics/natural-gas-ban-preemptive-laws-gop-climate/index.html>

<sup>121</sup> [https://www.eia.gov/dnav/ng/ng\\_prod\\_sum\\_a\\_EPGO\\_FPD\\_mmcfa.htm](https://www.eia.gov/dnav/ng/ng_prod_sum_a_EPGO_FPD_mmcfa.htm)

<sup>122</sup>

<https://docs.google.com/spreadsheets/d/1AUQGTypMLjpD5EwMt4b62ckojC7cNct3weyJcQsOuU/edit#gid=1594839360>

**Iowa** passed the HF 555 preemption bill in February of 2021 and **Ohio** passed the HB 201 preemption bill less than a month later, in March 2021 (see bill language side-by-side in Appendix G). Preemption bills were also introduced in Michigan and Minnesota in 2021 but did not pass. In 2023 there were new attempts at preemption in both states that have not even made it to a floor vote.

#### State Limitations on Local Building Codes

As mentioned in the Efficiency section above, some states have restrictions in place that limit a city's ability to pass their own building codes. This naturally limits building codes' availability as a tool to encourage electrification. In **Michigan**, the [Stille-Derossett-Hale Single State Construction Code Act](#) (passed in 1972 and amended in 1999) invalidates all construction regulations set by governmental subdivisions below the state.<sup>123</sup> While this law is not considered an out and out preemption, there has been concern that opponents to building electrification could use the law to bring legal challenges to local policies. In **Iowa**, the [2023 Benchmarking Act](#), signed into law in June, may also impact cities' abilities to pass stricter building codes. The act prohibits cities from requiring buildings to lower their energy consumption either against a baseline or a model. A proposed amendment, which did not pass, explicitly *prohibited* municipalities from passing *stricter* codes than the state and explicitly *allowed* municipalities to pass *less strict* building codes than the state.<sup>124</sup> However, it likely will further restrict how ordinances and building codes can be used in Iowa to encourage efficient fuel-switching.

## Equity Impacts of Restrictions on Fossil Fuels in Buildings

The equity concerns for gas prohibitions are similar to fuel-switching concerns, including impacts on the affordability and reliability of energy, and pass-through costs increasing housing costs. As prohibitions deal primarily with new construction, and often on larger consumers, concerns about displacement and the economics of fuel-switching are not as present. However, focusing on newer and larger construction fails to bridge disparities and to deliver the benefits of electrification equitably. Who can afford new housing determines who benefits from the savings and health benefits of electrified units. As more housing switches to electrified space and water heating, the customer base propping up the gas system will shrink, meaning that, in absence of public policy to guide the transition, fewer people would be left shouldering more of the cost of an outdated, increasingly expensive gas system.

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<sup>123</sup><https://graham.umich.edu/media/pubs/Moving-toward-Carbon-Neutrality-Banning-Natural-Gas-Connections-47327.pdf>

<sup>124</sup> <https://www.legis.iowa.gov/legislation/BillBook?ga=90&ba=HF%20605&v=i>

## Climate Potential

The scale of building upgrades needed in the residential sector to comply with IPCC commitments is unprecedented, [far outpacing the efficiency programs and electrification incentives](#)<sup>125</sup> that America has offered to date. Even with aggressive retrofits and electricity decarbonization, [continued in-home fossil fuel use poses a serious challenge](#)<sup>126</sup> for America in trying to meet the reduction targets set by the 2015 Paris agreement. A total of [197,200 new residential housing units](#) were completed in the Midwest in 2022.<sup>127</sup> If we multiply this by an average 3.19 t CO<sub>2</sub>-e/cap estimated from national energy statistics for residential energy use, new houses would produce 629k t CO<sub>2</sub>-e each year<sup>128</sup>), which is [equivalent to over 135k cars' worth of annual emissions](#).<sup>129</sup> Creating new building stock that uses fossil fuels has the potential to lock in emissions for decades. Requiring all-electric new construction, particularly given a greener electricity mix, has the potential to narrow the gap between reduction targets and feasible emissions reductions.

## Discussion

The goal of this first phase was to provide a picture of what local governments *can* do, and what ought to be considered in policy decisions to equitably administer programs. **With this snapshot in time, we do not go as far as to say what local governments *should* do, but rather help advocates and officials understand what are the best options when it comes to pathways that are legal, strategic, and equitable.**

No single pathway will clear the way for block-by-block electrification. Rather beneficial, equitable electrification depends on the relationship, and parallel development of many different policy areas, sometimes discussed in isolation. Methane gas preemption laws certainly impose barriers to the more direct emission-reducing policies, but may project more state authority than is legally present. For example, local benchmarking is allowed in three of the four focus states and can be an influential tool as it directly addresses and highlights the economic

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<sup>125</sup>

[https://docs.google.com/presentation/d/1zcxCXnBtEm4K58baIqJ2XI46fUuri5t1QCQeAQL9n1c/e dit#slide=id.g5156d3312605e220\\_19](https://docs.google.com/presentation/d/1zcxCXnBtEm4K58baIqJ2XI46fUuri5t1QCQeAQL9n1c/e dit#slide=id.g5156d3312605e220_19)

<sup>126</sup> <https://www.pnas.org/doi/10.1073/pnas.1922205117>

<sup>127</sup> <https://www.census.gov/construction/nrc/data/series.html>

<sup>128</sup> <https://www.pnas.org/doi/10.1073/pnas.1922205117>

<sup>129</sup> <https://www.pnas.org/doi/10.1073/pnas.1922205117>

benefits and potential savings of electrification. Other opportunities which are mentioned and will be focused on in Phase II are tax abatement and tax increment financing which can be key financial mechanisms for electrifying buildings. While not in the vein of program design at the local level, governments can also leverage their power to renegotiate their franchise agreements with utilities to spur utility action.

Additionally, the electrification of new versus existing buildings is often a tension of priorities that comes up in questions around an equitable transition. However, many of the other local levers identified that are available even in preemption states relate to existing buildings. Some of the most important of these levers are pre-weatherization and weatherization, which both address inequities and are often prerequisites for electrification.

Local governments can also take learnings from other statewide programs that fall short because program requirements or applicant criteria leave out a significant population, often low-income households and those disproportionately impacted by current energy and housing policy.

Phase I successfully laid out the landscape of policy conditions for electrification in four Midwest states, with implications across the region, and points to the suite of tools local governments can or cannot use. References to these places and programs can be found throughout the memo. More are listed in Appendix C which serves as the short list of local examples which we will explore more deeply in our planned Phase II. In Phase II, we also seek to add a more nuanced understanding to the legal extent of preemption as it relates to other pathways and how local governments are creatively working around state preemption and decarbonizing buildings..

## Glossary

**ASHP** - Air Source Heat Pump. While there are both ground-source and air-source heat pumps, unless specified as “ground-source,” we use “heat pumps” to refer to air-source heat pumps

**Benchmarking** - A policy used to encourage energy reductions. It typically refers to a method of tracking and reporting building energy use, either with comparisons against a baseline of the building itself, or against a model.

**Building Electrification** - In the ideal, building electrification refers to transforming heating and cooking appliances in buildings to all-electric. In practice, it can mean any partial increase in the use of electricity, as opposed to fossil fuels, as a fuel source in buildings.

**Building Performance Standard** - Outcome-based policies that require buildings to meet energy or emissions reduction targets.

**Clean Energy** - In this report, clean energy refers typically to the category of zero-carbon or carbon-neutral energy sources. It does not include nuclear or systems incorporating carbon capture.

**EERS** - Energy Efficiency Resource Standards set energy efficiency targets for utilities, most commonly measured as year-over-year energy savings in sales.

**Energy Burden** - The proportion of income spent on energy. High energy burden is typically defined as spending 6% or more of income on energy costs.

**Fuel Switching** - Any replacement of one fuel with another. It can refer to either switching between regulated fuels (such as electricity and methane gas), or between an unregulated and regulated fuel (such as propane and methane gas). However, most commonly in this report we use fuel switching to refer to the switch from methane gas to electricity.

**FPL** - Federal Poverty Level. A national income-level set as a national standard for poverty. As of 2023, it was \$14,580 for a household of one, with an additional \$5140 for each additional household member.

**Franchise Agreement** - contracts between municipalities and utilities that grant the utility rights to provide services in the city.

**GHG** - Greenhouse Gas Emissions are typically measured as CO<sub>2</sub> equivalent, given that carbon dioxide is the most common greenhouse gas.

**G&T** - Generation and Transmission Cooperatives provide wholesale power to member cooperative utilities that distribute the energy to consumers.

**IEA** - International Energy Agency. Not to be confused with the EIA, the IEA is an autonomous intergovernmental organization working towards a sustainable energy future.

**IECC** - International Energy Conservation Code is a regularly updated model code developed by the International Code Council, which addresses energy efficiency and sets minimum efficiency standards.

**Preemption** - preemption is a legislative tool where a larger body can prevent a smaller body from passing legislation (preempt them). Though preemption is used on multiple levels of government, on a range of topics, in this report the most common type of preemption we refer to is states preventing local governments from passing ordinances to prevent methane gas hookups.

**TIF** - Tax Increment Financing is a financing tool used by local governments to pay for public improvements and subsidize development. When a TIF District is created in a “blighted” area that would otherwise not see development, the property tax capacity baseline is established, and the increase in tax capacity brought by development is used to project an increase in tax revenue and issue bonds or a financing plan for the development on that basis.

**Weatherization** - refers to a series of home and building improvements that make heating and cooling more effective, including improving air sealing, insulation, moisture control, and ventilation. The Weatherization Assistance Program (WAP) is a federally funded program to provide these services for low income households.

# Appendices

## Appendix A

### Statewide Clean Energy Policy and GHG Reduction Targets

In Minnesota, the 2007 Next Generation Energy Act created [statutory benchmarks to reduce greenhouse emissions](#)<sup>130</sup> 15% from 2005 levels by 2015, 30% by 2025, and 80% by 2050. In 2022, [Minnesota's Climate Action Framework](#) updated goals for the state to reduce emissions 50% by 2030 and achieve net-zero emissions by 2050.<sup>131</sup>

The 2023 report of the Minnesota Pollution Control Agency (MPCA) shows that between 2005 and 2020, Minnesota's GHG emissions declined by 23%. If current trends continue, the state is on track to meet the goal of reducing emissions 30% by 2025. Electrical utilities were the sector with the biggest reduction, [reducing carbon emissions by 54%](#)<sup>132</sup> in the same time period. The renewable portfolio standard (RPS) set in 2007 that required 25% of the state's electricity to come from renewable power sources by 2025 [has already been achieved](#).<sup>133</sup> In 2022, [34% of the electricity generated](#) in Minnesota came from renewables.<sup>134</sup>

The [Natural Gas Innovation Act](#) (NGIA) of 2021 encouraged gas companies to file "innovation plans" in order to reduce emissions and help meet the state's climate goals.<sup>135</sup> These plans can include efficiency and strategic electrification, but can also include strategies such as biogas, renewable natural gas, power-to-hydrogen, power-to-ammonia, and carbon capture.

The Clean Energy Bill, which Governor Tim Waltz signed in February of 2023 sets Minnesota on a path to 100% carbon-free electricity by 2040. "The bill establishes a standard for utilities (renewable portfolio standard) to supply Minnesota customers with electricity generated or procured from carbon-free resources." It increases the renewables requirement to 55% by 2035 – at least 55% of an electric utility's total retail

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<sup>130</sup><https://mn.gov/commerce/news/?id=17-562337#:~:text=The%20state's%20bipartisan%202007%20Next,net%2Dzero%20emissions%20by%202050.>

<sup>131</sup> <https://www.pca.state.mn.us/climate-action-framework>

<sup>132</sup><https://mn.gov/commerce/news/?id=17-562337#:~:text=The%20state's%20bipartisan%202007%20Next,net%2Dzero%20emissions%20by%202050.>

<sup>133</sup><https://biomassmagazine.com/articles/19730/minnesota-bill-updates-rps-creates-carbon-free-mandate#:~:text=Minnesota%20implemented%20a%20renewable%20portfolio,to%2055%20percent%20by%202035.>

<sup>134</sup><https://www.eia.gov/electricity/data/browser/#/topic/0?agg=2,0,1&fuel=gfp4&geo=g0006k&sec=g&freq=A&start=2021&end=2022&ctype=linechart&ltype=pin&rtype=s&maptype=0&rse=0&pin=>

<sup>135</sup><https://energynews.us/2021/07/21/under-new-law-minnesota-gas-utilities-could-play-a-role-in-electrification/>

electric sales to customers in Minnesota must be generated or procured from eligible energy technologies.” The [carbon-free requirement starts](#) at 80 percent for public utilities and 60 percent for other electric utilities in 2030 and ramps up to 100 percent for both types of utilities in 2040.<sup>136</sup>

In **Michigan**, Governor Whitmer’s 2020 Executive Directive (2020-10) set the goal to “[achieve economy-wide carbon neutrality no later than 2050](#)”, which was followed by the Climate Healthy Plan (Executive Order 2020-182). It directs the state to reduce GHG emissions by 28% from 2005 levels by 2025. All new buildings and facilities owned and operated by the state, and all major renovations of such buildings and facilities, are carbon neutral by 2040. All existing buildings and facilities owned and operated by the state reduce energy use by 40% by 2040. [Public Act 342 of 2016 \(PA 342\)](#) amended Public Act 295 of 2008 (PA 295 or the Act).<sup>137</sup> It is increasing the renewable energy standard from 10% in 2015 to at least 12.5% in both 2019 and 2020 with a final requirement of at least 15% in 2021. The Act includes a goal of meeting not less than 35% of the state’s electric needs through a combination of energy waste reduction and renewable energy by 2025. It is applicable to Michigan’s rate-regulated electric utilities, cooperative electric utilities, municipal electric utilities, and alternative electric suppliers (AESs). Of all the electricity *generated* in Michigan in 2022, [12.9%](#) was fueled by renewables.<sup>138</sup>

In **Ohio**, what’s known as the Stuffed Chicken Bill - House Bill 507 from 2023 - defines methane gas as “green energy.” It also requires state agencies in Ohio to lease agency-owned or controlled oil and gas resources for development. In 2019, Governor DeWine signed [HB 6](#) which changed Ohio’s RPS to require that 8.5 percent of electricity sold by Ohio’s electric distribution utilities or electric services companies be generated from renewable energy sources by 2026.<sup>139</sup> This weakened the RPS, which was originally set at 12.5% renewables by 2024 and 0.5% from solar. HB 6 eliminated solar requirements. [Under 5%](#) of the electricity generated in Ohio in 2022 was fueled by renewables.<sup>140</sup>

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<sup>136</sup><https://mn.gov/commerce/news/?id=17-563384#:~:text=View%20entire%20list-,Governor%20Walz%20Signs%20Bill%20Moving%20Minnesota%20to%20100%20Percent%20Clean,Minnesota%20carbon%2Dfree%20electricity%20standard.>

<sup>137</sup><https://www.michigan.gov/mpsc/-/media/Project/Websites/mpsc/regulatory/reports/pa295-ren/2022-Renewable-Energy-Standard-Report.pdf?rev=eb9ccb636da145d282692997e95b1a13&hash=ABA9D664B600A62643B605AB867A2582>

<sup>138</sup><https://www.eia.gov/electricity/data/browser/#/topic/0?agg=2,0,1&fuel=gfp4&geo=g0006k&sec=g&freq=A&start=2021&end=2022&ctype=linechart&ltype=pin&rtype=s&maptype=0&rse=0&pin=>

<sup>139</sup><https://www.legislature.ohio.gov/legislation/133/hb6>

<sup>140</sup><https://www.eia.gov/electricity/data/browser/#/topic/0?agg=2,0,1&fuel=gfp4&geo=g0006k&sec=g&freq=A&start=2021&end=2022&ctype=linechart&ltype=pin&rtype=s&maptype=0&rse=0&pin=>



In 1983 **Iowa** became the [first state in the nation to adopt a renewable portfolio standard \(RPS\)](#) which required Iowa's two investor-owned electric utilities to own or to contract for a combined 105 megawatts of total renewable generating capacity.<sup>141</sup>

At the start of 2022, Iowa had about 12,300 megawatts of generating capacity fueled by renewable energy sources at utility-scale power facilities. [More than 60%](#) of electricity generated in Iowa in 2022 was fueled by renewables, almost entirely wind.<sup>142</sup> In 2007, Iowa passed [Bill 455B](#) that sets up statutory requirements for reporting GHG emissions but sets no reduction goals.<sup>143</sup> It requires the Department of Natural Resources to submit an annual GHG emissions report starting in 2011 and in every year thereafter. Iowa also administers a voluntary GHG reporting registry to track companies that reduce their GHG emissions or increase efficiency.

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## Appendix B

### Utility Clean Energy and GHG Goals

**Xcel**, in **Minnesota**, with service areas in 8 other states, was the [first major US utility](#) to commit to going carbon-free, back in 2018.<sup>144</sup> They have been [reporting and verifying](#) their GHG emissions with a third party for both electricity and methane gas as far back as 2005, as a part of The Climate Registry.<sup>145</sup>

Xcel [currently aims](#) to achieve carbon-free energy by 2050, and to reduce electricity emissions by 80% by 2030. In service of this overall goal, they [plan to lower GHG emissions from methane gas](#) by 25%, aiming for net-zero methane emissions from gas by 2030, and net-zero gas by 2050.<sup>146</sup> Their carbon-free plan was reviewed and [informed by an analysis](#) from Energy + Environmental Economics (E3).<sup>147</sup>

Their [vision for methane gas](#) includes reducing methane from delivery, conservation, increasing voluntary beneficial electrification, hydrogen and “Renewable Natural

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<sup>141</sup> <https://www.eia.gov/state/analysis.php?sid=IA>

<sup>142</sup> <https://www.eia.gov/electricity/data/browser/#/topic/0?agg=2,0,1&fuel=gfp4&geo=g0006k&sec=g&freq=A&start=2021&end=2022&ctype=linechart&ltype=pin&rtype=s&maptype=0&rse=0&pin=>

<sup>143</sup> <https://www.iowadnr.gov/environmental-protection/air-quality/greenhouse-gas-emissions>

<sup>144</sup> <https://www.vox.com/energy-and-environment/2018/12/5/18126920/xcel-energy-100-percent-clean-carbon-free>

<sup>145</sup> <https://www.xcelenergy.com/staticfiles/xe-responsive/Net-Zero-Vision-for-Natural-Gas.pdf>

<sup>146</sup> <https://mn.my.xcelenergy.com/s/our-commitment/carbon-reduction-plan>

<sup>147</sup> <https://www.xcelenergy.com/staticfiles/xe-responsive/E3-Natural-Gas-Plan-Analysis.pdf>

Gas”, and investing in carbon offsets.<sup>148</sup> Though Xcel is in many ways an industry leader for clean energy, their plan is indicative of the ways the industry relies on a range of “net-zero” technologies to reach ambitious goals, not all of which come with genuine emissions reductions or co-benefits.

Their [electricity plan](#) includes retiring all coal, increasing wind and solar, and extending the life of Xcel’s nuclear plant at Monticello.<sup>149</sup> In 2021, [Xcel reported](#) that 36% of their electricity mix came from renewable sources.<sup>150</sup>

**Mid-American**, in **Iowa** and several neighboring states, has a [stated goal](#) of 100% renewable electricity by 2050.<sup>151</sup> As of 2021, [they reported](#) that 88.5% of the energy they provide for Iowa customers came from renewable sources – almost all wind, and a small amount of biomass and hydropower. This was verified by the Iowa Utilities Board. However, a [Sierra Club report](#) shows that while this may be true for Iowa residential and commercial retail customers, Mid-American is still generating about a third of its energy in the state from coal plants.<sup>152</sup> In total, renewables were 58.4% of the energy generation mix, coal was 28.1%, nuclear 8.8%, and methane was 3.5%.<sup>153</sup>

Mid-American has no plan in place to retire their coal plants. For renewables, their [Wind PRIME](#) proposed project would use \$3.9 billion to increase wind energy.<sup>154</sup> An internal Mid-American [Zero Emissions study](#) done in 2019 also found that a mix of wind, solar, and battery storage would provide the best path from a resource-availability and cost perspective, and that solar photovoltaic provides the lowest cost zero emissions solution.<sup>155</sup> However, the public version of this study was not filed until February 2023, and the Wind PRIME proposal includes 2,042 megawatts (MW) of wind, but only 50 MW of solar and zero battery storage.

**AEP**, which operates in **Ohio** and 10 surrounding states, has committed to an [80% reduction in Scope 1 emissions](#) from generation, compared to 2005 levels, by 2030 and net-zero carbon emissions by 2045.<sup>156</sup> In service of this goal, they aim for a renewable generation portfolio approximately that represents 50% of their total capacity by 2030. They report a 63% CO2 reduction from 2005-2021. They report that

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<sup>148</sup> <https://www.xcelenergy.com/staticfiles/xe-responsive/Net-Zero-Vision-for-Natural-Gas.pdf>

<sup>149</sup> <https://stories.xcelenergy.com/ArticlePage/?id=4f9d0b7a-d423-ed11-b83e-000d3a37f39b>

<sup>150</sup> <https://mn.my.xcelenergy.com/s/our-commitment/carbon-reduction-plan/clean-energy-transition-progress>

<sup>151</sup> <https://www.midamericanenergy.com/net-zero-greenhouse-emissions>

<sup>152</sup> [https://www.sierraclub.org/sites/default/files/sce/iowa-chapter/energy-globalwarming/Climat e/TheCoalTruthReport\\_SierraClub8-2020.pdf](https://www.sierraclub.org/sites/default/files/sce/iowa-chapter/energy-globalwarming/Climat e/TheCoalTruthReport_SierraClub8-2020.pdf)

<sup>153</sup> <https://www.midamericanenergy.com/media/pdf/iowaannualfuelreport.pdf>

<sup>154</sup> <https://www.midamericanenergy.com/newsroom/2022-wind-prime-announcement>

<sup>155</sup> <https://www.sierraclub.org/iowa/blog/2023/02/iub-publishes-secret-midamerican-studies>

<sup>156</sup> <https://www.aep.com/about/ourstory/cleanenergy>

currently, hydroelectric, wind, solar and pumped storage accounts for 23% of their energy generation, and an additional 7% for nuclear.

AEP has published a [climate impact analysis](#) which they warn should *not* be seen as a prescriptive path forward.<sup>157</sup> Their [5-year capital plan](#) includes a \$9 billion investment in renewables.<sup>158</sup>

**DTE in Michigan** has [set a net-zero plan](#) for Scope 1 (and possibly Scope 2) emissions – to reduce CO2 and methane 30% by 2030, and 90% by 2040.<sup>159</sup> They aim to phase out coal and expand renewables to 50% of their fuel mix by 2035. However, their [clean energy plan](#) includes expanding methane gas (at least in the short term) as a “cleaner energy.”<sup>160</sup> These are not just words on a page – DTE has applied for and is receiving a [low-carbon grant from the Michigan state government](#) in order to expand methane gas service.<sup>161</sup>

### *Rural Electric Co-ops*

**Cherryland Electric**, in Northern Michigan, [states](#) that they “are committed to finding innovative ways to source energy that is not only clean, but also reliable and cost-efficient.”<sup>162</sup> They have no numerical target for clean energy or GHG reductions. Their energy mix is determined by Wolverine Power Supply Cooperative, and they [currently report](#) that 19% of their energy mix comes from renewables, and 62% from “Carbon-free” energy sources (which includes nuclear and hydropower). This is a higher renewable mix than the regional average, according to the Michigan Public Service Commission (MPSC).<sup>163</sup> They [publish](#) an annual renewable energy report, as required by MPSC.<sup>164</sup>

G&T contracts, such as Cherryland Electric’s sourcing from Wolverine Power Supply, can be limiting for co-ops who want to switch to renewables. [Rural co-ops have](#)

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<sup>157</sup><http://www.aepsustainability.com/performance/report/docs/AEPs-Climate-Impact-Analysis-2021.pdf>

<sup>158</sup><http://www.aepsustainability.com/lib/docs/2023-AEP-Sustainability-Report.pdf#Decarbonization>

<sup>159</sup><https://energynews.us/2022/05/11/dte-shareholders-reject-proposal-to-track-downstream-natural-gas-emissions/>

<sup>160</sup><https://dtecleanenergy.com/#:~:text=DTE%20Gas%20plans%20to%20achieve,%2C%20reliable%2C%20and%20affordable%20power.>

<sup>161</sup> [https://mpsc\\_grantproposals.apps.lara.state.mi.us/](https://mpsc_grantproposals.apps.lara.state.mi.us/)

<sup>162</sup> <https://cherrylandelectric.coop/energy/>

<sup>163</sup>[https://cherrylandelectric.coop/wp-content/uploads/2023/05/Cherryland\\_MayFuelMix-2023.pdf](https://cherrylandelectric.coop/wp-content/uploads/2023/05/Cherryland_MayFuelMix-2023.pdf)

<sup>164</sup>[https://cherrylandelectric.coop/wp-content/uploads/2021/01/U-16591-Renewable\\_Energy\\_Anual\\_Report\\_for\\_Cherryland\\_Electric\\_Cooperative.pdf](https://cherrylandelectric.coop/wp-content/uploads/2021/01/U-16591-Renewable_Energy_Anual_Report_for_Cherryland_Electric_Cooperative.pdf)

[lagged](#) behind other utilities for energy transition. But, they are also smaller and more nimble, with potential for significant change.<sup>165</sup>

### *Municipal Utilities*

**Cedar Falls Utilities** is the municipal utility for **Cedar Falls, Iowa** (providing gas, electricity, water, and communications). They have a goal to reduce CO2 equivalent emissions 45% from 2010 levels by 2030, and a long-term goal to be carbon-neutral by 2050.<sup>166</sup> They purchase electricity through a regional market, and report that more than 40% of the energy purchased in 2020 was wind-generated.

In general, in order to promote renewables, cities on some occasions have considered forming a municipal electric utility. For example, there was a long movement in [Decorah, IA](#), and an ongoing discussion in [Ann Arbor](#).<sup>167</sup> Municipalization [can be a long, hard-fought process](#), and sometimes (like in a high-profile case from Boulder, CO, which is served by Xcel) can end unsuccessfully after a decade of trying. However, there have been at least 20 successful campaigns for municipalization since 2020.<sup>168</sup>

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## Appendix C

### Future Case Studies & Notable Local Actions

The following is a preliminary list of case studies to be more deeply explored in phase 2 of this project.

- Ann Arbor, MI - A2Zero ([plan](#)) including a clean energy requirement and building section; BPS coalition ([press release](#)); 2023 proposed ban on methane gas hookups—postponed indefinitely ([article](#), [resolution](#)); franchise agreement negotiations with DTE ([article](#)); Green rental housing policy ([recommendations](#))
- Kalamazoo, MI - Affordable all-electric homes pilot ([source](#)); climate sustainability [plan](#) including goal to transform buildings and behavior;

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<sup>165</sup>

<https://www.eenews.net/articles/rural-utilities-turn-disruptive-as-they-embrace-renewables/>

<sup>166</sup> <https://www.cfu.net/save-energy/renewable-resources/>

<sup>167</sup> <https://energydistrict.org/2018/05/decorah-power-and-municipal-electric-utility-update/>;

<https://annarborpublicpower.org/>

<sup>168</sup> <https://www.publicpower.org/blog/municipalization-setting-record-straight>

Kalamazoo Energy Collaborative (voluntary assessment and benchmarking [program](#))

- Minneapolis, MN - 4d program ([website](#)) including green cost share; building policy in Minn2040 comprehensive plan ([policy](#)); cost of Minneapolis decarbonization prepared for the City ([report](#)).
- Edina, MN - Benchmarking ordinance ([source](#))
- St. Louis Park, MN - Climate Champions program offers free home audits; match utility rebates ([source](#))
- Red Wing, MN – rural, green steps program; Green Wing Energy Action Plan w/Xcel ([source](#)); Climate Action Work Plan ([source](#))
- Des Moines, IA - 24/7 clean electricity [plan](#)
- Johnson County Clean Energy District, IA - Re-thinking Energy in JC ([report](#))
- Robins, IA - reference to energy efficiency and renewable energy in franchise agreement with Interstate Power and Light ([source](#))
- Columbus OH - carbon neutral by 2050; 2020 Climate Action [Plan](#); benchmarking and transparency ordinance for buildings > 50,000 sqf ([source](#))
- Cincinnati, OH - in process of climate plan update with extensive building strategies ([plan](#))
- Lakewood, OH – Cuyahoga Sustainability Toolkit, energy efficiency page and utility programs ([source](#)); Cleveland MEEA case study ([source](#))
- Jackson Center, OH - Rural Ohio, partnership with Efficiency Smart ([source](#))

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## Appendix D

### State Requirements and Programs on Energy Efficiency and Weatherization

In **Iowa**, [Senate File 2386](#), enacted in 2008, established energy efficiency standards for each regulated utility in the state, and required them to file energy efficiency plans with the Iowa Utility Board. It also directed gas and electric municipal and rural electric cooperative utilities to establish energy efficiency goals.<sup>169</sup> Energy efficiency is also one of the five pillars of the [Iowa Energy Plan](#)<sup>170</sup>, released in 2016.

At the same time, Iowa has a number of constraints on energy efficiency regulation. The state passed spending caps for efficiency, in [SF 2311](#) and [SF 638](#) in [2019](#) that limited gas utilities to 1.5% of annual spending on efficiency, and 2% for electric utilities.<sup>171</sup> For reference, Minnesota requires electric utilities to spend *at least* 1.75%.

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<sup>169</sup> <https://www.legis.iowa.gov/legislation/BillBook?ba=SF2386&ga=82>

<sup>170</sup> <http://www.iowaenergyplan.org/docs/IowaEnergyPlan.pdf>

<sup>171</sup> <https://www.legis.iowa.gov/legislation/BillBook?ga=88&ba=sf638>

These low limits represent significant [missed opportunities](#)<sup>172</sup> and their [impacts](#) are already felt.<sup>173</sup> Iowa's residential and commercial energy codes are also [dated](#),<sup>174</sup> based on the 2012 IECC standards.

Iowa also provides support and incentivizes for energy efficiency in multiple ways. Several of these are designed to address energy burden and equity issues through energy efficiency. For example, the Iowa Code directs the Division of Community Action Agencies of the Department of Human Rights to provide low-income customers with energy assistance negotiating, a [deferred payment plan, and weatherization programs](#),<sup>175</sup> particularly for “elderly and handicapped persons.” They are required to provide notice of these programs for those facing shutoff or disconnection. Iowa also offers the Energy Bank Revolving Loan Program with a 1% interest rate for loans over \$50,000 for energy efficiency projects.

Iowa has a [voluntary B3 \(consumption of energy and water and carbon emissions\) Benchmarking Program](#) for public buildings.<sup>176</sup> However, the IEDA might be soft-sunsetting the voluntary benchmarking program. According to members of the Midwest Building Decarbonization Coalition, they were going to continue to support cities and counties that were active users, but they eliminated any budget for outreach, enrollment, technical assistance, etc. In [2023, the legislature also passed a “Benchmarking” bill to preempt cities](#) in Iowa from using building performance standards to reduce their year-over-year energy use.<sup>177</sup> While this leaves open mandatory tracking and reporting, it prevents cities from using a key tool for energy efficiency.

See [ACEEE's Iowa Scorecard](#) for more on its state administered Energy Efficiency programs.

In **Michigan** the two state laws related to utilities and energy efficiency are [the Clean, Renewable, and Efficient Energy Act](#)<sup>178</sup> of 2008 and the [Energy Waste Reduction Act](#)<sup>179</sup> of 2016, which extended and added to the provisions of the earlier law. Before 2021, the Energy Waste Reduction Standard required a minimum of spending on

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<sup>172</sup>[https://www.mwalliance.org/sites/default/files/meea-research/missed\\_opportunities\\_-\\_midwest\\_ee\\_policy\\_impacts.pdf?current=/taxonomy/term/11](https://www.mwalliance.org/sites/default/files/meea-research/missed_opportunities_-_midwest_ee_policy_impacts.pdf?current=/taxonomy/term/11)

<sup>173</sup><https://energynews.us/2021/07/07/since-2018-law-iowa-utilities-are-doing-a-lot-less-to-help-customers-save-energy/>

<sup>174</sup> <https://database.aceee.org/state/iowa>

<sup>175</sup> <https://www.legis.iowa.gov/docs/publications/LG/1151059.pdf>

<sup>176</sup> <https://ia.b3benchmarking.com/News>

<sup>177</sup><https://www.legis.iowa.gov/legislation/BillBook?ga=90&ba=HF%20605&v=e>

<sup>178</sup>[http://www.legislature.mi.gov/\(S\(2eunhlyzfhcngkelcblbofat\)\)/mileg.aspx?page=getObject&objectName=mcl-Act-295-of-2008](http://www.legislature.mi.gov/(S(2eunhlyzfhcngkelcblbofat))/mileg.aspx?page=getObject&objectName=mcl-Act-295-of-2008)

<sup>179</sup> <http://www.legislature.mi.gov/documents/2015-2016/publicact/pdf/2016-PA-0342.pdf>

electric energy savings of 1% annual sales and .75% of annual retail sales for methane gas. Since 2022, utilities also have to file a plan amendment every 2 years, and the Michigan Public Service Commission (MPSC) has the authority to approve a plan with higher or lower energy savings than 1% of sales. There was a 2% spending cap for energy efficiency, but it was eliminated as of 2017 ([source](#)). Michigan has an Executive Directive that [requires benchmarking of state buildings](#)<sup>180</sup> using ENERGY STAR. For [state energy codes](#), the residential and commercial building codes are weaker versions of IECC 2015.<sup>181</sup> Updates to the 2021 IECC are [in progress](#).<sup>182</sup> Additionally, local policies for benchmarking in private buildings are allowed.

Michigan's [Stille-Derossett-Hale-Single State Construction Code Act](#)<sup>183</sup> from 1972 limits local ability to adopt stricter building codes. While this law is not considered an out and out preemption, there has been concern that opponents to building electrification could bring legal challenges to local policies based on this law.

Michigan has a number of programs to support and incentivize energy efficiency. Several of these are designed to address energy burden and equity issues through energy efficiency. These include the Michigan Public Service Commission ([MPSC Low-Income Energy Workgroup](#)),<sup>184</sup> which shares resources, recommendations, and best practices. The Low-income Energy Policy Board oversees the workgroup and Energy Affordability and Accessibility Collaborative ([EAAC](#)) and “Coordinates efforts with the Governor's task forces to develop cohesive policies across state agencies,” and hosted a policy summit in 2022. In addition, 35% of Michigan residents qualify for [Low Income Energy Waste Reduction \(EWR\)](#)<sup>185</sup> programs.

See [ACEEE's Michigan Scorecard](#) for more on its state administered Energy Efficiency programs.

In **Minnesota**, the [Conservation Improvement Program \(CIP\)](#)<sup>186</sup> governed energy-savings by gas and electric utilities since the early 1980's. The 2007 Next Generation Energy Act (NGEA) [codified the utility energy savings goals of the CIP](#)<sup>187</sup>.

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<sup>180</sup>[http://www.michigan.gov/documents/buymichiganfirst/Exec\\_Dir\\_2007-22\\_Enhanced\\_Energy\\_Efficiency\\_228953\\_7.pdf](http://www.michigan.gov/documents/buymichiganfirst/Exec_Dir_2007-22_Enhanced_Energy_Efficiency_228953_7.pdf)

<sup>181</sup> <https://database.aceee.org/state/michigan>

<sup>182</sup> [https://www.michigan.gov/lara/bureau-list/bcc/rules-acts/rules/currently-open?sc\\_site=lara](https://www.michigan.gov/lara/bureau-list/bcc/rules-acts/rules/currently-open?sc_site=lara)

<sup>183</sup><https://graham.umich.edu/media/pubs/Moving-toward-Carbon-Neutrality-Banning-Natural-Gas-Connections-47327.pdf>

<sup>184</sup>

<https://www.michigan.gov/mpsc/commission/workgroups/low-income-energy-policy-board>

<sup>185</sup><https://assets.ctfassets.net/ntcn17sslw9/64aWq4MgVXhtHRkAnYDGXL/54154aba566798d6e7059be213f01fce/equity-in-energy-efficiency-investment-and-savings-report-2017.pdf>

<sup>186</sup> <https://mn.gov/commerce/energy/industry-government/cip/>

<sup>187</sup><https://www.mwalliance.org/blog/minnesota-passes-eco-act-modern-and-expansive-update-its-ee-framework>



The [Minnesota Energy Conservation and Optimization \(ECO\) Act](#) of 2021 updated the NGEA and CIP.<sup>188</sup> It increased the state's energy savings mandate from 1.5% to 2.5%. It also requires Electric IOUs to save 1.75% of gross annual retail energy sales. Municipal and co-ops maintain a 1.5% energy savings goal. At least .95% of the savings are required to come from conservation improvements that exclude fuel switching. Gas IOUs have an annual savings goal of 1% of retail energy sales.

Utilities must spend at least 0.2% of the consumer-owned utility's gross operating revenue from residential customers in Minnesota on energy conservation programs for low-income households, up to 15 percent of which can go to pre-weatherization measures. Minnesota sets the eligibility for the Low-Income Home Energy Assistance Program (LIHEAP) at 60% of the state median income (which is currently higher than 200% the federal poverty level) and Weatherization Assistance Program (WAP) at 200% of the federal poverty level or 60 % of the state median income, whichever is higher.

The 2012 IECC is in effect for residential construction; as of March 2020, the 2018 IECC is in place for commercial construction. Sustainable Buildings 2030 standards have been set for all MN State bonded projects and a [B3 Benchmarking Program](#)<sup>189</sup> is required for [public school buildings](#).<sup>190</sup> Local policies for benchmarking in private buildings are allowed.

Very recent laws are augmenting these. In the 2022 legislative session, Rep. Bierman introduced a [weatherization bill](#) that would have increased funding and training for weatherization and pre-weatherization, but the omnibus bills did not end up passing that session.<sup>191</sup> The bill was [reintroduced](#), and ended up in the [2023 Energy Omnibus Bill](#)<sup>192</sup> which has more than \$38 million for pre-weatherization. [HF 772](#), passed in May 2023, directs the Department of Labor and Industry to consider building codes that mitigate GHG emissions and adopt commercial energy codes of the new published edition of ASHRAE 90.1, requiring a 80% reduction in net energy consumption by 2036 (compared to a 2004 baseline).<sup>193</sup>

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<sup>188</sup>[https://www.revisor.mn.gov/bills/text.php?number=HF164&type=bill&version=2&session=1s92&session\\_year=2021&session\\_number=0](https://www.revisor.mn.gov/bills/text.php?number=HF164&type=bill&version=2&session=1s92&session_year=2021&session_number=0)

<sup>189</sup> <https://mn.b3benchmarking.com/Statistics>

<sup>190</sup>[https://www.revisor.mn.gov/statutes/2022/cite/123B.651?keyword\\_type=all&keyword=B3+Benchmarking](https://www.revisor.mn.gov/statutes/2022/cite/123B.651?keyword_type=all&keyword=B3+Benchmarking)

<sup>191</sup> <https://www.electrobertbierman.com/blog/2022/7/10/energy-and-weatherization>

<sup>192</sup><https://www.minnpost.com/environment/2023/05/minnesota-legislature-passes-energy-bill-with-2500-ev-rebates-pre-weatherization/>

<sup>193</sup>[https://www.revisor.mn.gov/bills/text.php?number=HF772&type=bill&version=2&session=1s93&session\\_year=2023&session\\_number=0](https://www.revisor.mn.gov/bills/text.php?number=HF772&type=bill&version=2&session=1s93&session_year=2023&session_number=0)



See [ACEEE's Minnesota's Scorecard](#) for more on its state administered Energy Efficiency programs.

**Ohio** required benchmarking in public buildings in EO 2007 - O2S, with a reduction of 15% in four fiscal years. Local policies for benchmarking in private buildings are allowed. [HB 251](#)<sup>194</sup>, which passed in 2007, amended Ohio Revised Code to require life-cycle cost analysis for state-funded buildings over 20,000 square feet, and that the Construction Commission [develop energy efficiency and conservation programs](#)<sup>195</sup> for new construction design and review and for existing building audit and retrofit. Ohio's [scandal-filled House Bill 6 included a gutting of the electric energy efficiency standard](#)<sup>196</sup> which had previously [required two per cent energy savings each year](#).<sup>197</sup> It effectively eliminated the “Energy Efficiency Resource Standard” by lowering the cumulative electric energy demand reduction from 22% by 2025 to 17.5%, and prohibiting cost-recovery starting in 2020 if that target had been met. The law did not include gas utilities. Columbia Gas, for instance, was still [running energy efficiency programs](#) through 2022 – although they have since gutted them, following an early 2023 rate case.<sup>198</sup> There is also currently [a proposal](#) in the House that would restore to utilities the option of voluntary energy efficiency portfolios.<sup>199</sup> Ohio's residential building code is based on the 2018 IRC/IECC. The commercial code is based on 2012 IECC and 2010 ASHRAE 90.1.

See [ACEEE's Ohio's Scorecard](#) for more on its state administered Energy Efficiency programs.

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## Appendix E

### Energy Efficiency and Weatherization in Utilities

#### *Investor-Owned Utilities*

**Mid-American**, in **Iowa**, offers [Home Check online](#) and Home Energy Reports, where the utility randomly selects a group of homeowners to compare their home energy use and receive tips on saving energy.<sup>200</sup> Mid-American also has the [Load](#)

<sup>194</sup> [http://archives.legislature.state.oh.us/bills.cfm?ID=126\\_HB\\_251](http://archives.legislature.state.oh.us/bills.cfm?ID=126_HB_251)

<sup>195</sup> <https://codes.ohio.gov/ohio-revised-code/chapter-123>

<sup>196</sup> <https://energynews.us/newsletter/%E2%9A%A1-whats-next-in-ohios-ongoing-hb-6-scandal/>

<sup>197</sup> <https://codes.ohio.gov/ohio-revised-code/section-4928.66>

<sup>198</sup> <https://news.wosu.org/2022-11-15/columbia-gas-rate-increase-up-for-hearing-this-week-befo-re-state-regulators>

<sup>199</sup> <https://ohiocapitaljournal.com/2023/07/05/ohio-utilities-could-resume-energy-efficiency-programs-under-bipartisan-bill/>

<sup>200</sup> <https://www.midamericanenergy.com/homecheck>

[Management and voluntary Summer Saver initiative](#), which lets Mid-American set your thermostat for you at peak times.<sup>201</sup> It offers [appliance recycling](#), with \$50 for qualifying refrigerators and freezers<sup>202</sup> and discounts on [residential and non-residential equipment](#),<sup>203</sup> such as discounts on methane gas furnaces, or rebates for air-source heat pumps, ductless mini-splits, and Smart thermostats. Mid-American also has the [Income Qualified Multifamily Housing program](#)<sup>204</sup> to increase energy efficiency in multifamily housing. In terms of commercial buildings, Mid-American offers [nonresidential energy solutions](#)<sup>205</sup> and Commercial New Construction, including small business express consultation and direct assistance for projects in facilities >50,000 square feet and with more than \$100,000 annual energy expenses.

Mid-American also recently filed a [5-year efficiency plan](#) with the Iowa Utility Board.<sup>206</sup> The plan outlines about an 85 cent rate increase for efficiency program cost recovery (.218 cents/kwh) and about a 50% increase to the residential efficiency program budget. The plan includes three types of low-income programs: support for the Statewide WAP, supplemental weatherization, and home energy reports. They dedicate 16.7 million dollars of spending for these programs, out of a total 356 million dollars for Energy Efficiency and Demand Response – 4.69%. Mid-American estimates that [200,000 of its total 1,595,000 customers are eligible](#) – 12.53%.<sup>207</sup>

**Xcel Energy, in Minnesota,** offers the [Home Energy Squad](#), with free virtual visits and a \$70-100 home visit to help implement small efficiency changes – like weatherstripping or LED light bulbs – and plan for larger upgrades.<sup>208</sup> The Home Energy Squad is available to owners, and to renters with prior approval of their landlord. Those who are income qualified might be eligible for materials in addition to labor. They also offer a Home Audit (standard rate is \$60), after which customers can opt-in to Xcel's [Whole Home Efficiency](#) program, which provides rebates and certain free efficiency items.<sup>209</sup> There is also the [Income Qualified Energy Savings Program](#) for customers at or below 50% of the state median income. This includes a free home visit and weatherization services, and potentially appliance replacement

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<sup>201</sup> <https://www.midamericanenergy.com/summersaver>

<sup>202</sup> <https://www.midamericanenergy.com/appliance-recycling>

<sup>203</sup> <https://www.midamericanenergy.com/ia-residential-rebates>

<sup>204</sup> <https://www.midamericanenergy.com/media/pdf/energy-efficiency-affordable-housing.pdf>

<sup>205</sup> <https://www.midamericanenergy.com/nes>

<sup>206</sup> [https://www.midamericanenergy.com/media/pdf/2024-28\\_energy\\_efficiency\\_plan.pdf](https://www.midamericanenergy.com/media/pdf/2024-28_energy_efficiency_plan.pdf)

<sup>207</sup>

[https://wcc.efs.iowa.gov/cs/idcplg?IdcService=GET\\_FILE&allowInterrupt=1&RevisionSelectionMethod=latest&dDocName=2112865&noSaveAs=1#xd\\_co\\_f=OTI1NWMxMWItYjhjOC00NjM4LTk1ZTktYmQ4NTczNDZiMmJh~](https://wcc.efs.iowa.gov/cs/idcplg?IdcService=GET_FILE&allowInterrupt=1&RevisionSelectionMethod=latest&dDocName=2112865&noSaveAs=1#xd_co_f=OTI1NWMxMWItYjhjOC00NjM4LTk1ZTktYmQ4NTczNDZiMmJh~)

<sup>208</sup> <https://mn.my.xcelenergy.com/s/residential/home-services/home-energy-squad>

<sup>209</sup> <https://mn.my.xcelenergy.com/s/residential/home-services/whole-home-efficiency>

with free recycling.<sup>210</sup> For new homes, Xcel has the [Efficient New Home Construction plan review](#) analysis and onsite verification.<sup>211</sup>

Xcel also offers [rebates](#)<sup>212</sup> for more efficient methane gas heating equipment and [Heat Pump Rebates](#),<sup>213</sup> with a higher rebate for mini-split heat pumps (MSHP) when replacing electric baseboard heaters. There is also [Appliance Recycling](#),<sup>214</sup> with \$50 rebate for qualifying refrigerators and freezers, [Water Heater Rebates](#)<sup>215</sup> to install ENERGY STAR sufficiently efficient methane gas (not eligible if replacing) or electric heat pump water heaters, and [Insulation and Air Sealing Rebates](#)<sup>216</sup> for specific improvement requirements, covering up to 30% of cost, or \$150-350 depending on improvement type. For new commercial buildings, Xcel has the [Energy Efficient Buildings program](#)<sup>217</sup> which includes free consultation and rebates.

Xcel also just filed their latest [efficiency plan](#) (2024-6) with the Minnesota Department of Commerce.<sup>218</sup> It proposes \$598 million dollars of gas and electric efficiency spending. Of the \$572 million going towards Efficiency and Demand Response, \$47 million is for income-qualified programs – around 8.2%. This plan is also the first to include efficient fuel-switching, in accordance with the ECO Act (2021) – with a proposed \$21 million going towards fuel switching for almost 30,000 customers over 3 years. Of those 30,000 fuel switching customers, only 18 are budgeted to be income-qualified.

**American Electric Power (AEP)**, in **Ohio**, offers [helpful efficiency tips on the website](#).<sup>219</sup> However, they offer no clear programs or incentives other than the [AEP Ohio Energy Efficiency Marketplace](#), which provides discounted prices on efficient appliances.<sup>220</sup>

**DTE Energy** offers the [Energy Efficiency Assistance \(EEA\) program](#)<sup>221</sup> for people with a household income at or below 200% percent of the federal poverty guidelines.

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<sup>210</sup><https://mn.my.xcelenergy.com/s/billing-payment/energy-assistance/income-qualified-home-energy-savings>

<sup>211</sup><https://mn.my.xcelenergy.com/s/residential/home-services/efficient-new-home-construction>

<sup>212</sup> <https://mn.my.xcelenergy.com/s/residential/heating-cooling/heating-equipment-rebates>

<sup>213</sup> <https://mn.my.xcelenergy.com/s/residential/heating-cooling/heat-pumps>

<sup>214</sup> <https://mn.my.xcelenergy.com/s/residential/home-services/refrigerator-recycling>

<sup>215</sup> <https://mn.my.xcelenergy.com/s/residential/home-rebates/water-heaters>

<sup>216</sup> <https://mn.my.xcelenergy.com/s/residential/home-rebates/insulation-air-sealing>

<sup>217</sup><https://mn.my.xcelenergy.com/s/business/new-building-programs/energy-efficient-buildings>

<sup>218</sup><https://www.xcelenergy.com/staticfiles/xe-responsive/Company/Rates%20&%20Regulations/23-92%20-%202024-2026%20MN%20Triennial%20Plan%20062923.pdf>

<sup>219</sup> <https://www.aepohio.com/savings/>

<sup>220</sup> <https://aepohiomarketplace.com/>

<sup>221</sup><https://www.dteenergy.com/us/en/residential/save-money-energy/get-started-with/limited-income-assistance.html>

People with an active enrollment in the Low Income Self Sufficiency Plan or other state low-income public assistance programs (SNAP, WIC, etc.) are also eligible. Customers' DTE account must be active and in good standing for them to be eligible, and Interested people need to contact one of these [participating organizations in order to participate](#).<sup>222</sup> DTE also offers [free Home Energy Walkthroughs](#)<sup>223</sup> for single family homes, duplexes, or condos. They have an [Energy Assessment Rebate](#),<sup>224</sup> with a \$50 rebate for assessment and a \$75-150 rebate for air sealing, depending on the degree of improvement and [Furnace, boiler or air conditioning replacement or tune-up and rebate](#).<sup>225</sup> They also have [DTE Marketplace](#)<sup>226</sup> with discounts for customers on a wide variety of products.

#### *Rural Electric Co-ops*

**Cherryland Electric**, in Northern **Michigan**, [offers](#) free home assessments, free appliance recycling, rebates for new energy star appliances, and commercial rebates up to 15,000 per project for energy efficiency upgrades.<sup>227</sup>

#### *Municipal-Owned Utilities*

**Cedar Falls Utilities** [offers](#) appliance rebates, appliance recycling rebates, and comfort consultations, utility bill analysis and energy assessments for residential customers.<sup>228</sup> They also offer [free audits for businesses](#)<sup>229</sup>

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## Appendix F

### Utility Fuel Switching Programs

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<sup>222</sup>

<https://www.dteenergy.com/content/dam/dteenergy/deg/website/residential/save-money-and-energy/get-started-with/EEAParticipatingOrganizations.pdf>

<sup>223</sup>

<https://www.dteenergy.com/us/en/residential/save-money-energy/get-started-with/home-energy-check-up.html#tabs-c702da7255-item-05fd053e0a>

<sup>224</sup>

<https://www.dteenergy.com/us/en/residential/save-money-energy/get-started-with/home-energy-check-up.html#tabs-c702da7255-item-0128ef758e>

<sup>225</sup>

<https://www.dteenergy.com/us/en/residential/save-money-energy/rebates-and-offers/furnaces.html#tabs-c837338eb4-item-58fda16bee>

<sup>226</sup> <https://www.dtemarketplace.com/>

<sup>227</sup> <https://cherrylandelectric.coop/rebates/>

<sup>228</sup>

[https://www.cfu.net/webres/File/save-energy/2023%20Forms/2023%20Summary%20Rebate%20Sheet\\_03072023.pdf](https://www.cfu.net/webres/File/save-energy/2023%20Forms/2023%20Summary%20Rebate%20Sheet_03072023.pdf)

<sup>229</sup> <https://www.cfu.net/save-energy/business-rebates/>

**Mid-American**, in **Iowa**, has no specific programs targeted towards electrification. They offer an “Instant Discount” for methane gas furnaces, between \$60 and \$213 a unit, applied at the time of purchase as long as you work with an approved provider. [Heat pumps](#), on the other hand, have a rebate of up to about \$600/unit, depending on the size, which must be applied for and granted after purchase and cannot exceed 50% of the installed cost.<sup>230</sup>

**AEP**, in **Ohio**, provides [several resources](#) in support of electrification, although no particular incentives. Resources include a directory of contractors, an electrification planning sheet and technology library, and contact information for Energy Advisors who can consult and give advice on electrification.<sup>231</sup>

**Xcel**, in **Minnesota**, supports switching both to methane gas and to electric in various ways. They include a [calculator](#) so customers can estimate potential savings from switching from propane or heating oil to methane gas.<sup>232</sup> They offer a range of rebates, [including up to](#) \$2,500 rebate on ground source heat pumps (their estimate is that installation of a GSHP would cost \$15,000 for an average home) and \$600 for a mini-split ductless air source heat pump (ASHP).<sup>233</sup> They offer [up to \\$400](#) in rebates for high-efficiency methane gas furnaces.<sup>234</sup> For [water heaters](#), they offer between \$75-250 for methane gas water heaters, and \$400-500 for electric.<sup>235</sup> They do [make available](#) a discounted rate for electric heating, though they do not make clear how much the discount is.<sup>236</sup>

**DTE**, in **Michigan**, primarily promotes fuel-switching to methane gas, but makes some programs available for electric. Like Xcel, they have a [cost savings calculator](#) to estimate savings from switching from propane to methane gas.<sup>237</sup>

They also have a “quiz” and [site devoted](#) to explaining heat pumps. The site estimates \$30 additional cost/year for ASHP compared to methane gas, which they inaccurately describe as “one of the most cost effective and environmentally friendly fossil fuels.”<sup>238</sup>

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<sup>230</sup> <https://www.midamericanenergy.com/ia-residential-rebates>

<sup>231</sup> <https://www.aepohio.com/savings/electrification/>

<sup>232</sup> <https://mn.my.xcelenergy.com/s/residential/heating-cooling/switch-to-natural-gas>

<sup>233</sup> <https://mn.my.xcelenergy.com/s/residential/heating-cooling/heat-pumps>

<sup>234</sup> <https://mn.my.xcelenergy.com/s/residential/heating-cooling/heating-equipment-rebates>

<sup>235</sup> <https://mn.my.xcelenergy.com/s/residential/home-rebates/water-heaters>

<sup>236</sup> <https://mn.my.xcelenergy.com/s/residential/heating-cooling/heating-upgrade-rebates>

<sup>237</sup> <https://www.dteenergy.com/us/en/residential/service-request/natural-gas/switch-to-natural-gas.html>

<sup>238</sup> <https://www.dteenergy.com/us/en/quicklinks/thinking-about-geothermal-ashp.html>

They do offer [heat pump rebates](#), up to \$850 for an ASHP and \$1000 for a ductless mini-split heat pump.<sup>239</sup> However, they only make these rebates available for replacing existing heat pumps, or, for mini-split heat pumps, for replacing electric baseboard heating. They do offer special electricity rate programs: an [ASHP rate](#) (which is called cooling but applies for heating as well) can provide a discount, they say, of 30% in winter and 10% in summer – in exchange for DTE interrupting service in 15-minute intervals during peak demand.<sup>240</sup> Their [Water Heating Service Rate](#) can offer a discounted rate for electric water heating, but requires separate wiring and entitles DTE to interrupt electricity to water heater up to 4 hours a day.<sup>241</sup>

### *Municipal Utilities*

The **Cedar Falls Utility** offers rebates for electric water heaters and heat pumps. The rebates are about [a hundred dollars more](#) than the rebates they offer for equivalent methane gas equipment – up to \$400 for an electric water heater, and up to \$600 for an air-source heat pump. The standard [residential electricity rate](#) is structured to moderately alleviate the cost of electric heating: in winter (October-May), all electricity consumed above 800 KWH is charged at a 62 cent lower base rate than standard (4.80¢ per KWH as opposed to 5.42¢).<sup>242</sup>

### *Rural Electric Co-ops*

A report produced by a [RE-AMP action team](#) in 2019 focused on what rural electric co-ops across the Midwest were doing to advance equitable building electrification. The report found that 88% of all Midwest co-ops offer some rebate or loan program for energy upgrades. Sixteen Midwest co-ops offer near-full beneficial electrification programs (meaning they met most, but not all, of the action team’s outlined criteria) – about half of which were in Minnesota.<sup>243</sup>

**Cherryland Electric, in Michigan, [incentivizes fuel switching](#)** by offering rebates for Electric or Heat Pump Water heaters in new construction and fuel switches from methane gas or propane. Likewise, they offer rebates for new heat pumps, but not for replacements.<sup>244</sup> They offer up to \$500 for a heat pump water heater, and up to \$1,500 for an air source heat pump (provided that the home had no prior central air conditioning). They do also offer a [dual meter program](#) where customers receive a

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<sup>239</sup><https://www.dteenergy.com/us/en/residential/save-money-energy/rebates-and-offers/air-conditioners.html>

<sup>240</sup><https://www.dteenergy.com/content/dam/dteenergy/deg/website/residential/Service-Request/pricing/residential-pricing-options/CoolCurrents.pdf>

<sup>241</sup><https://www.dteenergy.com/us/en/residential/service-request/pricing/rate-options/residential-pricing-options.html>

<sup>242</sup> <https://www.cfu.net/utilities/electric-service/residential-rates>

<sup>243</sup><https://www.eesi.org/files/REPORT-Equitable-Beneficial-Electrification-for-Rural-Electric-Co-operatives.pdf>

<sup>244</sup> <https://cherrylandelectric.coop/wp-content/uploads/2023/03/res-rebate-table-2023.pdf>

reduced home heat rate for electric heating. For air source heat pumps, the home heat rate offers a 3¢ reduction for the home heating rate during the winter season (November-May).<sup>245</sup>

## Appendix G

### Ohio and Iowa Preemption Legislation: Side by Side

<a href="#">Ohio HB 201</a>	<a href="#">Iowa HF 555</a>
<ul style="list-style-type: none"> <li>● <b>Sec. 4933.41.(A)</b> (1) Every person seeking to obtain distribution service or retail methane gas service has the right to obtain any available distribution service or retail methane gas service from a methane gas company with capacity to provide service to the person in that location...             <ul style="list-style-type: none"> <li>○ (2) Every person seeking to obtain propane has the right to obtain propane from any energy dealer willing to provide propane to that customer in that location.</li> </ul> </li> <li>● (C) No legislative or executive authority of any political subdivision shall enact any ordinance or resolution or promulgate or impose any building code , contractual provision, or other requirement that limits, prohibits, or prevents residential, commercial, or industrial consumers within their boundaries from using the following:             <ul style="list-style-type: none"> <li>○ Distribution service or retail methane gas service that would otherwise be available to those consumers under Title and regulations promulgated thereunder;</li> <li>○ Propane</li> </ul> </li> <li>● (D) Except as set forth in division (C) of this section, nothing in section 4933.41 of the Revised Code is intended to inhibit or restrict a municipality's right and ability to enter into and administer franchise agreements pursuant to Sections <a href="#">4</a> and <a href="#">6</a> of Article XVIII,</li> </ul>	<ul style="list-style-type: none"> <li>● A county (and same repeats for city) shall not adopt, enforce, or otherwise administer an ordinance, motion, resolution, or amendment, or use any other means, to restrict, impede, regulate, or prohibit, intentionally or effectively, any of the following:</li> <li>● The provision of methane gas service by a public utility as defined in section 476.1, a competitive methane gas provider as defined in section 476.86, or a retail propane marketer or retail propane dispenser as those terms are defined in section 101C.2 to a person, business, municipality, or other wholesale or retail customer within or outside the county.</li> <li>● The purchase of methane gas or propane from a competitive methane gas provider as defined in section 476.86 or a retail propane marketer or retail propane dispenser as those terms are defined in section 101C.2, or the receipt of methane gas or propane service from a public utility as defined in section 476.1, by any person, business, municipality, or other wholesale or retail customer within or outside the county.</li> <li>● 22 b. Paragraph “a” does not apply to an ordinance, motion, resolution, or amendment that regulates a retail propane marketer or retail propane dispenser, as those terms are defined in section 101C.2, adopted before the effective date of this Act.</li> </ul>

<sup>245</sup>[https://cherrylandelectric.coop/wp-content/uploads/2021/05/Checklist\\_Home-Heat-Rate-Program.pdf](https://cherrylandelectric.coop/wp-content/uploads/2021/05/Checklist_Home-Heat-Rate-Program.pdf)



Ohio Constitution, and sections 4939.01 to 4939.09 of the Revised Code.

- (E) Nothing in this section shall be construed either to limit a methane gas company's ability to provide service to new customers or to require free extensions of service.
  
- **Sec. 4933.42.** Section 4933.41 of the Revised Code promotes the public policy of the state to do the following:
  - (A) Increase utilization of the state's indigenous energy resources as provided in section 1551.18 of the Revised Code.
  - (B) Promote the availability of methane gas services and goods as provided in section 4929.02 of the Revised Code.
  - (C) Encourage the utilization of propane.