



Electrification of Multifamily Housing in Minnesota

Ensuring an Equitable Approach

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Abstract

Technological challenges notwithstanding, there will be unique policy and programmatic barriers that prevent rapid implementation of whole-building electrification within multifamily buildings. Despite these barriers, the electrification of multifamily buildings should happen alongside broader electrification efforts to ensure equitable access to the benefits electrification has to offer to both owners and residents of multifamily buildings.

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Definition of Terms and Acronyms

Terms

Energy Burden: the proportion of gross household income that is used to pay energy costs

Energy Insecurity: an inability to adequately meet basic household energy needs

Equity: elimination of barriers to full participation in the process and access to the full benefits of the outcome

Housing Burden: 30% of income spent on rent and utilities

Multifamily: buildings with five or more units in a common corridor apartment style building

Acronyms

BIPOC: Black, Indigenous, People of Color

C-PACE: Commercial Property Assessed Clean Energy

CARD: Conservation Applied Research and Development

CIP: Conservation Improvement Program

DLI: Minnesota Department of Labor and Industry

ECO: Energy Conservation and Optimization Act of 2021

EJ: Environmental Justice

EPA: U.S. Environmental Protection Agency

GHG: Greenhouse Gas

HVAC: Heating, Ventilation, Air-Conditioning

IECC: International Energy Conservation Code

IOU: Investor-owned Utility

LIHTC: Low-income Housing Tax Credit

LIWP-MF: Low-Income Weatherization Program for Multifamily

NOAH: Naturally Occurring Affordable Housing

QAP: Qualified Allocation Plan

TAC: Technical Advisory Committee of the Minnesota Electrification Action Plan

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Executive Summary

The multifamily housing sector in Minnesota presents unique challenges to electrification. Yet as irreversible climate change impacts are approaching, there is now a sense of urgency to address Minnesota's fossil fuel usage in buildings and accelerate its usage of renewable energy sources. Electrification, which is the process of swapping out an end use (for example, space heating) that utilizes a fossil fuel as an energy source, such as natural gas, with an end use that utilizes electricity, is one major way to address this area of concern. This paper informs policymakers, program administrators and implementers, housing developers, housing and energy advocates, and related decision-makers and influencers on necessary considerations to make as they plan to electrify Minnesota's multifamily housing stock.

Recent passage of the Energy Conservation and Optimization (ECO) Act will allow for cost-effective electrification to take place in Minnesota; fuel switching, which was once banned in the state's Conservation Improvement Program, is now permitted.¹ Given this encouraging update, it is timely to analyze all the potential benefits, barriers, and opportunities that come with electrifying multifamily housing. While this paper attempts to give a general overview of the major considerations, it does not advocate for certain policies to be implemented. As more specific pathways in policy and program planning emerge as a result of the new legislation, it will be important to frequently review additional factors that may affect electrification in the state's multifamily housing stock.

Benefits of Electrification of Multifamily Housing in Minnesota

There are many benefits to having strategies focused on the electrification of multifamily buildings. First, electrification can help mitigate climate change impacts. According to 2017 data, Minnesota ranks tenth in most direct building greenhouse gas emissions by state and currently the building sector is increasing its carbon dioxide emissions.² Electrification in the multifamily housing sector can contribute to a significant decrease in the state's greenhouse gas emissions and reduce harmful air pollution.

Second, electrification can serve as one of many tools to address environmental justice and reduce energy burdens in under-resourced households. Large portions of one's income in an under-resourced household goes to housing (in this case, rent) and energy bills.³ Indoor and outdoor air quality also tend to be worse in communities of color and under-resourced areas.⁴ It will be essential to prioritize these communities first for electrification, in combination with energy efficiency measures, such as weatherization. Combining such measures with on-site generation and storage would dramatically increase resilience, economic well-being, and overall health of these communities.

¹ Minnesota Session Laws--2021, Regular Session, Chapter 29 (H.F. 164).

<https://www.revisor.mn.gov/laws/2021/0/29>.

² "The Impact of Fossil Fuels in Buildings." RMI, 2019, <https://rmi.org/insight/the-impact-of-fossil-fuels-in-buildings>.

³ Lyubich, E. "The Race Gap in Residential Energy Expenditures." Energy Institute at Haas, June 2020, <https://haas.berkeley.edu/wp-content/uploads/WP306.pdf>.

⁴ "Respiratory health disparities in the United States and their economic repercussions." Washington Center for Equitable Growth, 12 July 2018, <https://equitablegrowth.org/respiratory-health-disparities-in-the-united-states-and-their-economic-repercussions>.

Third, indoor air quality is made worse through fossil fuel end uses such as heating and cooking.⁵ Public health is a major indirect benefit of electrification, particularly when paired with energy efficiency improvements. Exposure to harmful toxins would decrease through electrification if fossil fuel appliances were replaced with electric. Electrification of multifamily buildings would contribute to healthier, safer, and more comfortable living environments for renters.

Electrification also has the potential to improve the quality of the overall housing stock in Minnesota, especially when combined with deeper retrofits and energy efficiency measures.

Barriers to Electrification of Multifamily Housing in Minnesota

Although there are many benefits electrification could create in multifamily housing, these buildings do have unique barriers that may make the process difficult, particularly when compared to the electrification of single-family homes or smaller 2-4 unit multifamily buildings.

First, a major issue is the split incentive; the party that invests in improvements on the building may not be the party that actually benefits from such improvements.⁶ For example, if the building owner decides to make building improvements that may yield cost savings in the future, the rent may be raised to recuperate those up-front costs. Therefore, the owner is receiving the monetary benefits, yet the renter is not. While the renter may see aesthetic or comfort-related benefits from such improvements, these improvements could force the renter to move out if they result in higher housing costs. In the other case, if a renter pays for utilities and sees cost savings from electrification, then there is less of an incentive for the owner to invest in improvements if they are not receiving any benefits.

Another barrier is the complexity that comes with electrifying existing multifamily buildings, especially affordable ones. With tight cash flow, limited staff capacity, and more people to coordinate and schedule around (including property managers and renters), the time and money to invest in capital improvements such as electrification can be discouraging. New construction could be easier to electrify because of the elimination of such complications, but the overall construction costs may be higher.

Other difficulties of electrification include understanding all the different incentive programs that are available, finding knowledgeable contractors who understand the technology and can offer affordable services, and preventing gentrification and displacement. These additional barriers need to be addressed to better enable equitable electrification in multifamily housing.

⁵ Partin, M. "Clean Energy Brief: Natural Gas in Minnesota." Fresh Energy, February 2020, <https://2lwej44565rn2mmjlk31pmwg-wpengine.netdna-ssl.com/wp-content/uploads/2020/05/The-Health-Safety-and-Economic-Impacts-of-Using-Natural-Gas-to-Power-MN-Buildings-Final-Updated-051820.pdf>.

⁶ "Impacts of the Split Incentive on Privately Owned Rental Housing with Implications for an Energy Saving Housing Initiative." UMD Labovitz School of Business and Economics, 30 June, 2016, <https://conservancy.umn.edu/bitstream/handle/11299/203326/BBER%20Report%20Impacts%20of%20the%20Split%20Incentive%20on%20Privately%20Owned%20Rental%20Housing.pdf?sequence=1&isAllowed=y>.

Opportunities for Electrification of Multifamily Housing in Minnesota

Despite the barriers mentioned above, there are several opportunities that would help in the electrification process of multifamily buildings. First, modernizing and updating building codes to reflect Minnesota's climate goals and transition to clean energy would help expedite electrification. This is important as greenhouse gas emissions in the building sector have continued to increase.⁷ A baseline requirement that was identified by a Minnesota Department of Labor and Industry workgroup would be to build all new large multifamily buildings and all multifamily buildings undergoing substantial rehab as all-electric buildings.⁸ These conversations surrounding building codes are still underway.

Second, designing programs and providing incentives to encourage electrification is another important pathway that should be carefully crafted. Several papers that discuss both equity and electrification emphasize the notion that meaningful community engagement must be a major part of the process.⁹ Timely, equitable, community-centered approaches must be taken to avoid widening socioeconomic and racial disparities in housing and to ensure the most impacted groups benefit from the electrification process. Underserved communities should be prioritized first in electrification so they are not left behind to cover the remaining costs of fossil fuel energy. If programs are designed without a goal of reducing disparities, then disproportionate outcomes will persist. Trust, technical assistance, in-depth and timely communication, streamlined processes, and targeted education and workforce development in under-resourced communities and communities of color will be important factors in creating an effective and equitable electrification program.

Funding such a program is a major challenge. Financial savings from utility rebate programs are not as effective in benefitting under-resourced communities, and owners and renters may find it difficult to bridge the remaining project cost after rebates. Residents that are already cost-burdened and building owners may not have access to a funding source that allows them to acquire upfront financing for capital improvements. Dedicated long-term funding pools and equipment leasing, which leads to smaller more flexible payments spread out during a longer timeline, are potential solutions for funding electrification programs.

Third, another avenue of opportunity is legislation. As mentioned above, the ECO Act allows for electrification and requires increased spending in under-resourced communities. Other states and municipalities have considered and enacted various policies including the acceleration of switching to

⁷ "Greenhouse gas emissions inventory 2005-2018." Minnesota Pollution Control Agency, March 2021, <https://www.pca.state.mn.us/sites/default/files/lraq-1sy21.pdf>.

⁸ "Improving building energy efficiency in commercial and multi-family construction." Minnesota Department of Labor, December 2020, <https://www.dli.mn.gov/sites/default/files/pdf/BuildingsEnergyEfficiency2020.pdf>.

⁹ "Equitable Building Electrification: A Framework for Powering Resilient Communities." Greenlining Institute and Energy Efficiency for All, 2019, https://assets.ctfassets.net/ntcn17ss1ow9/4bcrgrRiiymPoVKoMDCqPz/8568c1dd9eec6545c901c3b035a77832/Greenlining_EquitableElectrification_Report_2019_WEB.pdf; Facilitating Power and Movement Strategy Center. *The Spectrum of Community Engagement to Ownership*. <https://www.cabq.gov/office-of-equity-inclusion/documents/spectrum-2-1-1-1.pdf>.

electrified technologies or phasing out of fossil fuel-powered technologies in new construction.¹⁰ There is nothing specific in the ECO Act that explicitly calls out electrification in multifamily housing, therefore it is still an area to potentially expand legislation in regard to electrification activities going forward. There are few examples currently on electrification of multifamily housing in Minnesota, so legislators will certainly need to consider the impacts of ECO and future bills in future sessions.

Lastly, cities and states may have their own jurisdiction on how to address electrification, whether it is through incentives, tax credits, or other financing mechanisms. This paper highlights some examples of finance agencies, counties, and cities that align their local programs and incentives with their climate goals.



¹⁰ “An Act To Transform Maine’s Heat Pump Market To Advance Economic Security and Climate Objectives.” Maine Legislature, LD 1766, https://www.mainelegislature.org/legis/bills/bills_129th/billtexts/SP059701.asp; Berkeley, California City Council Meeting. July 16, 2019. http://berkeley.granicus.com/MediaPlayer.php?publish_id=70986fb1-a8be-11e9-b703-0050569183fa.

Introduction

Introduction to Electrification in Minnesota

Electrification Action Plan

This paper emerged from the work of the Minnesota Electrification Action Plan¹¹, which was funded through a U.S. Department of Energy grant in the State Energy Program. The Action Plan, convened by the Minnesota Department of Commerce and Michaels Energy, sought to study Minnesota’s regulatory framework on electrification, as well as determine how electrification could contribute toward the state’s carbon-reduction goals.

Much of this work occurred through the Plan’s Technical Advisory Committee (TAC). The TAC consisted of three workgroups: Metrics, Grid Impacts, and Technology. During these workgroup meetings, members discussed that electrifying the multifamily sector would likely require its own regulatory and policy framework. However, these considerations did not neatly fit into any one workgroup scope. Thus, multifamily electrification remained on the periphery of the Action Plan’s work, and it was determined that more explicit attention should be paid to the distinct barriers and opportunities in electrifying Minnesota’s multifamily housing units.

Electrification

Electrification in the housing sector means swapping out an end use (water heating, space heating, appliances) that utilizes fossil fuels (e.g. natural gas) with an end use that utilizes electricity. Electrification has emerged as a topic in the energy space as of late because the country’s fuel mix is rapidly transitioning from fossil fuel generation to renewable energy generation. Using renewable energy as opposed to natural gas or delivered fuels such as propane has environmental benefits (reduced greenhouse gas emissions), health benefits (improved indoor air quality), and financial benefits (potential lower end use costs for the consumer). Therefore, as the grid becomes greener, electrification becomes more and more valuable as a tool for utilities and consumers.

While it is a valuable approach in many respects, electrification may not make sense in all contexts. Per the Beneficial Electrification League, electrification is considered beneficial when the electrification measure meets at least one of the following stipulations without negatively impacting the others:

- reduces greenhouse gas emissions;
- saves customers money over time;
- improves grid resiliency;
- improves product quality or consumer quality of life.¹²

Fresh Energy developed a beneficial electrification framework that considers electrification to be “beneficial” when it 1) reduces the lifecycle greenhouse gases of implemented technologies through the conversion of end-uses powered by fossil or other carbon-based fuels to electricity *and* the upgrade of existing electrical equipment to higher-efficiency technologies, and 2) improves public health and safety

¹¹ “Electrification Action Plan.” Michael’s Energy, 2019, <https://michaelsenergy.com/electrification-action-plan>.

¹² “Promoting Beneficial Electrification.” Beneficial Electrification League, 8 June 2021, <https://be-league.com>.

by reducing exposure to nitrogen oxides, sulfur oxides, and volatile organic compounds in indoor and outdoor air as well as the risk of fire, explosion, and carbon monoxide poisoning. The framework prioritizes decarbonization of electricity generation, maximizing consumer savings, enhancing electrical grid operation, advancing energy access and equity, and supporting clean energy jobs.¹³

Similarly, Minnesota’s Energy Conservation and Optimization (ECO) Act, the statute that enables utility electrification programs, defines an efficient fuel-switching improvement as one that:

- results in a net reduction in the amount of source energy consumed for a particular use, measured on a fuel-neutral basis;
- results in a net reduction of statewide greenhouse gas emissions over the lifetime of the improvement;
- is cost-effective, considering the costs and benefits from the perspective of the utility, participants, and society; and
- is installed and operated in a manner that improves the utility's system load factor.¹⁴

When this paper uses the term “electrification,” it is meant only in situations where the electrification improvement would be considered beneficial and efficient. As technologies improve and the grid continues to lessen its reliance on fossil fuels, it is anticipated that electrification will become more beneficial in more situations.

Electrification Policy Landscape

As the Electrification Action Plan process began in Minnesota, the state still had its ban on fuel-switching in place. The TAC believed that in order to encourage electrification of multifamily buildings, the state of Minnesota would likely need to legislatively amend its current fuel-switching prohibition. Minnesota’s regulated utilities were not allowed to encourage or incentivize fuel-switching under the Conservation Improvement Program (CIP), per a 2005 Department of Commerce order.¹⁵ The Department of Commerce made an exception in 2012 to this rule: utilities may provide fuel-switching measures to under-resourced customers who rely on delivered fuels or are customers of CIP-exempt natural gas utilities.¹⁶

Seeing the fuel-switching ban as a potential obstacle to decarbonization, Minnesota’s lawmakers explored legislative changes over the last few years in order to allow beneficial electrification. The ECO Act was first introduced in 2019 and was passed in the most recent legislative session in May 2021. The legislation took the former CIP framework and expanded it by increasing the energy savings requirement, increasing the spending requirement on under-resourced households, and allowing beneficial electrification, among other provisions. While the ECO Act does not mandate that utilities offer electrification programs, the legislation incentivizes utilities to electrify end uses by allowing

¹³ “Beneficial electrification and our clean energy future.” Fresh Energy, 24 January, 2019, <https://fresh-energy.org/beneficial-electrification-and-our-clean-energy-future>.

¹⁴ Minnesota Session Laws--2021, Regular Session, Chapter 29 (H.F. 164). <https://www.revisor.mn.gov/laws/2021/0/29>.

¹⁵ *Order*. March 7, 2005. Docket No. G008/CIP-00-864.07.

¹⁶ “CIP Policy Guidelines:

Energy Savings from Delivered Fuels.” Minnesota Department of Commerce, Division of Energy Resources, 3 August, 2012, <https://mn.gov/commerce-stat/pdfs/conserves-prog-delivered-fuels.pdf>.

utilities to count the energy savings from electrification toward their energy savings requirements, which can potentially be a big help to rural electric cooperatives and municipal utilities who have had difficulties in meeting their mandated energy savings levels. The ECO Act does, however, limit how much of their gross annual retail energy sales utilities can spend annually on electrification measures. Investor-owned utilities (IOUs) cannot spend more than .35% and consumer-owned utilities cannot spend more than .55%, with the caps lasting until July 2026.

With this legal framework in mind, it is likely that the state's utilities will begin to roll out electrification programs soon, even though the extent of the programs will be limited by the spending caps.

Introduction to Multifamily Landscape in Minnesota

Context

The following information provides context for this white paper and was derived from the American Community Survey¹⁷:

- Minnesota has 2,477,515 housing units.
- 612,172 housing units are rented.
- 1,321,956 people live in rental units.
- 358,256 housing units are being rented by households with incomes less than \$50,000.
- 260,878 renter households are burdened by their housing costs.
- 460,570 of the state's housing units are in multifamily buildings with five units or more.
- 435,851 of the state's rental units were built before 1990.

The Typical Multifamily Building

Multifamily buildings vary in size and style across the state. In 2013, Franklin Energy completed a Conservation Applied Research and Development (CARD) funded study to characterize energy usage in Minnesota's multifamily housing. This study found that for a typical multifamily building, the owner or property manager is responsible for the natural gas bill, which typically includes building heat and domestic hot water. The owner or property manager is also responsible for electric bills for common area electric consumption and the water bill for the entire building. Renters are typically responsible for electric bills for in-unit lights and appliances.¹⁸ A 2014 study showed that owners of multifamily buildings in Minnesota with 10 units or more spent an average of \$958/unit on energy costs annually.¹⁹

¹⁷ American Community Survey. United States Census Bureau, 2019, <https://www.census.gov/programs-surveys/acs>.

¹⁸ Minnesota Multifamily Rental Characterization Study. Energy Center of Wisconsin and Franklin Energy LLC, June 2013, <http://www.mnshi.umn.edu/cs/retrofit/MNMFamilysingle.html>.

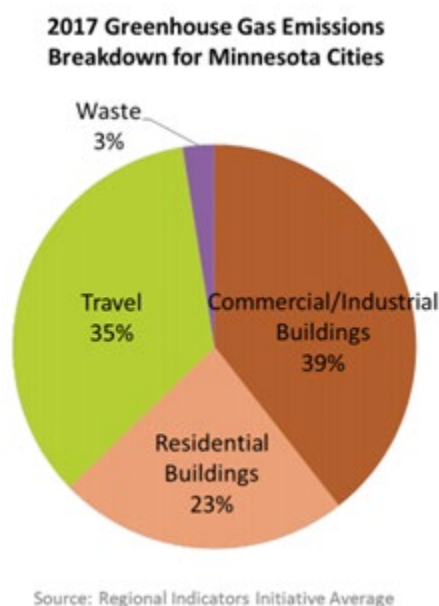
¹⁹ "Energy Brief: Multifamily Housing Master Metered." Minnesota Sustainable Housing Initiative, 2007-2021, http://www.mnshi.umn.edu/cs/profiles/mm_familysingle.html.

Benefits of Electrification in Multifamily Buildings

Climate

Building retrofits and Minnesota’s long-term climate outlook are deeply intertwined. Figure 1 shows the breakdown of greenhouse gas (GHG) emissions in Minnesota from 2017. In recent years, Minnesota policymakers have proposed a goal of 100% carbon-free electricity by 2040, and the state’s Next Generation Energy Act has already set a requirement of an 80% reduction in GHG emissions by 2050. Two of the largest IOUs in the state have also declared goals of 100% carbon-free energy by 2050.²⁰ Currently, Minnesota is not on track to meet its carbon reduction goals. Multifamily housing plays a significant role, and electrification can dramatically reduce the contributing GHG emissions of this sector. Minnesota ranks tenth in most direct building GHG emissions (i.e., burning fossil fuels on-site) by state.²¹ The majority of housing in Minnesota uses natural gas as a source for heating, and many households have additional natural gas appliances, such as gas stoves and water heaters. Eliminating the use of natural gas to heat homes, supply hot water, and provide fuel for cooking would help Minnesota cut 23% of its annual carbon emissions.

Figure 1. 2017 Greenhouse Gas Emissions Breakdown for Minnesota Cities²²



²⁰ “Minnesota governor accelerates state’s carbon-free power target 10 years, to 2040.” Utility Dive, 25 January 2021, <https://www.utilitydive.com/news/minnesota-governor-accelerates-states-carbon-free-power-target-10-years-t/593834>.

²¹ “The Impact of Fossil Fuels in Buildings.” RMI, 2019, <https://rmi.org/insight/the-impact-of-fossil-fuels-in-buildings>.

²² “Improving building energy efficiency in commercial and multi-family construction.” Minnesota Department of Labor and Industry & Minnesota Department of Commerce, December 2020, <https://www.dli.mn.gov/sites/default/files/pdf/BuildingsEnergyEfficiency2020.pdf>.

Minnesota’s carbon reduction goals are increasingly important as its climate changes and will continue to do so for the foreseeable future. The state’s climate is becoming warmer and wetter, resulting in heavier rains, higher average temperatures, and a shorter frost season.²³ Regions throughout the United States are experiencing, and will continue to experience, significant impacts as a result of climate change.²⁴ As climate-related disasters, such as wildfires, drought, hurricanes and flooding, are expected to increase throughout the nation, the Midwest will likely find itself home to more residents seeking a more resilient and stable climate.²⁵ Accelerating energy efficiency and electrification investments in buildings presents a key opportunity to fortify infrastructure while proactively addressing climate change and climate migration in Minnesota.

Despite global warming and the aforementioned impacts of climate change, Minnesota does have a cold climate that presents challenges to mass electrification. The state is split, with the southern half of the state in Climate Zone 6 (“Cold”) and the northern half in Climate Zone 7 (“Very Cold”).²⁶ The cold climate can degrade the efficiency levels of air source heat pumps, further limiting some of the potential reduction of GHG emissions.²⁷ Though research and field tests demonstrate that the performance of air source heat pumps in cold weather has improved over time, natural gas backup systems may be required to ensure reliability once temperatures drop below freezing, the inclusion of which can reduce the emissions benefits and cost savings presented by efficient electric systems.²⁸ While the benefits of electrification increase as the grid becomes cleaner, and new cold-climate air source heat pump models are being introduced, it is important to consider the current constraints.

Equity, Environmental Justice, & Community Resilience

As Minnesota considers opportunities to electrify its housing stock, equity, environmental justice, and community resilience should be central considerations. In Minnesota and throughout the United States, communities of color and under-resourced (sometimes called “low-income”) households²⁹ have been historically disinvested in, underserved, and marginalized. Due to factors tied to housing discrimination and racially discriminatory urban planning and zoning decisions, people of color and under-resourced

²³ “Minnesota’s Climate is Already Changing.” Minnesota Department of Natural Resources, 2019, https://files.dnr.state.mn.us/natural_resources/climate/change/climatechange-factsheet.pdf.

²⁴ “The Effects of Climate Change.” NASA, 5 August, 2021, <https://climate.nasa.gov/effects>.

²⁵ Rose, Maria. “Rust Belt and midwest cities need to plan on many fronts for new ‘climate migrants’.” NPR, 29 April, 2020, <https://stateimpact.npr.org/pennsylvania/2020/04/29/rust-belt-and-midwest-cities-need-to-plan-on-many-fronts-for-new-climate-migrants>.

²⁶ Pacific Northwest National Laboratory. “Guide to Determining Climate Regions by County.” U.S. Department of Energy, Energy Efficiency & Renewable Energy, August 2015, pp. 21-22, https://www.energy.gov/sites/prod/files/2015/10/f27/ba_climate_region_guide_7.3.pdf.

²⁷ Blanding, I. & Ehrendreich, G. “You’re Getting Warmer: A Comparison of Gas Furnaces and Heat Pumps in Midwest Homes.” Midwest Energy Efficiency Alliance, September 2018, <https://www.mwalliance.org/sites/default/files/Furnaces-vs-ASHPs-Sept18.pdf>.

²⁸ “Cold Climate Air Source Heat Pump Field Assessment.” Center for Energy and Environment, 2015-2017, <https://www.mncee.org/cold-climate-air-source-heat-pump-field-assessment>.

²⁹ Throughout this paper, the authors use the term “under-resourced” to refer to households or communities that are often called “low-income.” Community partners have shared that “under-resourced” is a preferred term and the authors use it accordingly here.

populations are disproportionately more likely to live near environmental hazards and sources of pollution, including but not limited to: coal-fired power plants, hazardous and solid waste facilities, major roadways, industrial zones, and many others. As a result of this reality, these groups tend to inhabit areas with poorer air quality that drive health disparities and socioeconomic disadvantages.³⁰

In addition to these broader environmental justice issues, people of color also tend to have lower rates of access to energy efficiency resulting in disproportionately high energy burdens and energy affordability challenges.³¹ In essence, though these populations live less energy-consumptive lifestyles than predominantly white populations, they still end up spending larger shares of their income on household energy needs.³²

Notably, there is significant overlap in the typical residents of multifamily buildings, especially subsidized housing, and the subpopulations most impacted by inequity in air quality, and energy efficiency access and affordability.³³ Electrification holds critical potential for addressing inequity on both of these fronts because it can improve indoor air quality by displacing fossil fuel end uses in households and can make energy more affordable if deployed in an efficient and cost-effective manner.

Much of the multifamily housing stock in under-resourced communities has great potential for energy efficiency and electrification improvements. According to PolicyLink, renters of color in Minnesota are more energy insecure than white renters.³⁴ Reducing a household's energy burden allows money that they would have spent on utilities to be used for other necessities.

Depending on the configuration of the multifamily building (e.g. square footage, number of units, multiple buildings within a complex, etc.), weatherization improvements combined with renewable on-site generation, like rooftop photovoltaic solar, and battery storage can contribute to community resilience as people experience the impacts of climate change. With renewable on-site generation and local battery storage, neighborhoods can rely on this hyper-local resiliency, reducing demand on the broader local grid, which would ease any potential outages as upgrades to regional transmission and distribution infrastructure are completed. Prioritizing these communities first and investing in highly efficient, electrified multifamily housing, potentially with on-site generation and storage, would empower under-resourced residents to become leaders in electrification and mitigating climate change.

³⁰ "Fumes Across the Fence Line: the Health Impacts of Air Pollution from Oil & Gas Facilities on African American Communities," NAACP. <https://naacp.org/resources/fumes-across-fence-line-health-impacts-air-pollution-oil-gas-facilities-african-american>.

³¹ Lyubich, E. "The Race Gap in Residential Energy Expenditures." Energy Institute at Haas, June 2020, <https://haas.berkeley.edu/wp-content/uploads/WP306.pdf>.

³² Reames, T. "Targeting energy justice: Exploring spatial, racial/ethnic and socioeconomic disparities in urban residential heating energy efficiency." Energy Policy, 26 July 2016, <https://justurbanenergy.files.wordpress.com/2018/03/reames-2016-targeting-energy-justice.pdf>.

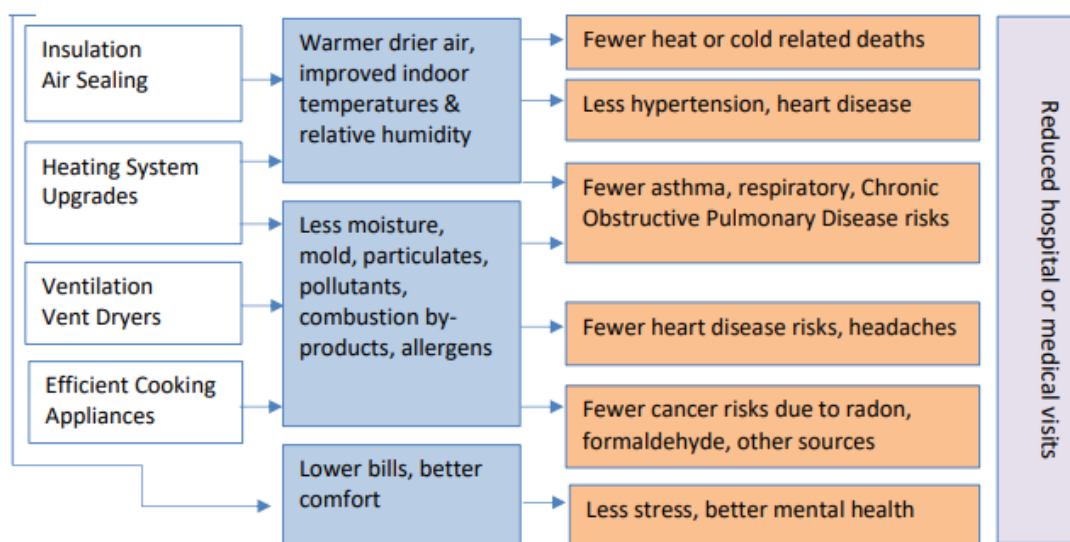
³³ Hausman, C. & Stolper, S. "Inequality, Information Failures, and Air Pollution." December 2020, http://www-personal.umich.edu/~chausman/HausmanStolper_InequalityInformation.pdf.

³⁴ "Rent Debt in America: Stabilizing Renters is Key to Equitable Recovery." PolicyLink, 2021, <https://www.policylink.org/node/63161>.

Health

Electrification projects would also improve the overall health, safety, and comfort of multifamily buildings, in part by improving indoor air quality. Energy efficiency and weatherization improvements, such as air sealing and insulation, are fundamental first steps to take toward a healthy indoor environment. See Figure 2 for a list of health benefits due to energy efficiency improvements alone. Electrification could be a way to further reduce exposure to harmful air pollutants.³⁵ Gas appliances release nitrogen oxides, sulfur oxides, and volatile organic compounds, along with posing a risk of fire, explosion, and carbon monoxide poisoning. Thus, electrification eliminates these dangerous occurrences.

Figure 2. Health Benefits from Energy Efficiency Improvements³⁶



Creating healthier, safer, and more comfortable living environments for renters could decrease instances of illness, which in turn could decrease the instances of missed school and work. Fewer instances of illness would also reduce medical visits and associated costs, contributing to less stress and improved mental health. Electrification poses even more of a benefit for under-resourced families, particularly families of color. There are significant health disparities between white households and Black, Indigenous, People of Color (BIPOC) households. For example, under-resourced BIPOC households often face more barriers to access care, and, when accessed, often receive lower-quality care.³⁷ This leads to worse health outcomes. Electrification in combination with energy efficiency improvements could greatly contribute to an increased quality of life, especially for under-resourced BIPOC families, who are already disproportionately energy burdened as discussed above. Any future program or policy

³⁵ Partin, M. "Clean Energy Brief: Natural Gas in Minnesota." Fresh Energy, February 2020, <https://2lwej44565rn2mmjlk31pmwq-wpengine.netdna-ssl.com/wp-content/uploads/2020/05/The-Health-Safety-and-Economic-Impacts-of-Using-Natural-Gas-to-Power-MN-Buildings-Final-Updated-051820.pdf>.

³⁶ "Occupant Health Benefits of Residential Energy Efficiency." E4The Future, Inc., November 2016. <https://e4thefuture.org/wp-content/uploads/2016/11/Occupant-Health-Benefits-Residential-EE.pdf>.

³⁷ "Respiratory health disparities in the United States and their economic repercussions." Washington Center for Equitable Growth, 12 July 2018, <https://equitablegrowth.org/respiratory-health-disparities-in-the-united-states-and-their-economic-repercussions>.

should take into consideration these indirect benefits of electrification, particularly when it comes to reducing socioeconomic and racial health disparities.

Improvements to the Housing Stock

The process of electrifying existing buildings may lead to additional investments in and improvements to the overall building stock. Many building owners will undertake electrification along with other efficiency and rehabilitation projects for ease of financing, contractor coordination, and resident satisfaction. Efficiency and other projects that may happen alongside electrification may lead to deeper carbon savings that would have otherwise resulted. Additionally, while these improvements may have taken place anyway, electrification may encourage investment to take place sooner. However, it is important to consider that although electrification efforts may benefit existing buildings, there are still barriers to electrification, as will be discussed in the next section. With that in mind, focusing electrification efforts on new construction where beneficial electrification can be built into the design may be easier.

Barriers to Electrifying Multifamily Buildings

Split Incentive

Multifamily buildings may have several different meter configurations based on the age and type of building. For master metered buildings, the owner or property manager would pay for natural gas and electric usage for the entire building, including common areas and individual units. Alternatively, either or both natural gas and electric usage may be individually metered. In this case, the owner or property manager would pay only for the common area utilities, with renters responsible for paying in-unit usage. In the most common utility configuration of a multifamily building, the owner or property manager would pay for natural gas associated with air heating and water heating for the whole building, while the renter would pay for electric usage associated with their individual unit.

It is unclear whether electrification will decrease or increase the total cost on either resident or owner utility bills, which may result in a split incentive that prevents electrification. A split incentive is a situation in which improvements are made to a building or in a unit, where the party responsible for paying for the improvement is not the party that will receive the benefits of the improvement.³⁸ If utility cost savings are a result of building electrification, owners of master-metered buildings may be more likely to experience financial benefits of these projects. Beyond the direct impact on operating costs, these savings could allow for reinvestment in the building to make other needed repairs and may prevent the building owner or property manager from needing to increase rents to cover these costs. If electrification resulted in higher utility bills for the owner, it may make such investments more difficult if they were unable to receive a return on their investment.

³⁸ “Impacts of the Split Incentive on Privately Owned Rental Housing with Implications for an Energy Saving Housing Initiative.” UMD Labovitz School of Business and Economics, 30 June, 2016, <https://conservancy.umn.edu/bitstream/handle/11299/203326/BBER%20Report%20Impacts%20of%20the%20Split%20Incentive%20on%20Privately%20Owned%20Rental%20Housing.pdf?sequence=1&isAllowed=y>.

For buildings where renters are responsible for paying a portion of their utility bills, some of the financial benefits (or potential financial burden) would likely be reflected on renter utility bills. If financial savings are expected, this could be beneficial in reducing the energy burden experienced by renters; however, in this case there would be less incentive for owners or property managers to invest in spaces where they would not see the financial benefit compared to master metered buildings. If electrification was more likely to increase utility bills for renters, this would not necessarily create a disincentive for electrification by the owner or property manager, but bill increases could place an undue burden on the renters.

Any future program or policy should help incentivize projects even if the owner or property manager might not be the direct recipient of the benefit. Similarly, any future program or policy should protect residents from utility bill increases.

Electrifying Existing Buildings

Owners and property managers of multifamily housing try to plan projects several years in advance and have long-term capital improvement plans that list out the expected projects for the lifetime of the building. When owners and property managers are ready to move forward with a project, they develop a timeline for improvements and a budget that accounts for the expenses. This includes operating cash, reserve funds, and utility incentives.

Small improvements can be absorbed into the existing operating budget, but larger projects are not always possible given tight cash flow. Electrification improvements can be more time- and cost-intensive than just switching out an appliance. For example, some components of building electrification may require upgrading electric panels and other similar upgrades, which can add to the expense. If market rate and affordable multifamily buildings are unable to pay for building electrification through their operating budget or reserves, they will be required to apply for financing from a financial institution. The major source of financing for affordable multifamily buildings is through the Low-Income Housing Tax Credit (LIHTC)³⁹. The application process for this source of funds is both lengthy and costly. Access to this source of funds is also very competitive and it may take several application submissions over a number of years before a project is chosen. Once chosen, the project will be subject to a variety of requirements, including construction and design compliance. Any future program or policy should take into consideration the substantial length of time it takes for owners and property managers to plan improvements and secure financing prior to being able to complete a project.

Owners and property managers of subsidized, multifamily, affordable housing buildings struggle to implement energy projects for several reasons. Some properties are not managed by the owner but rather are managed by a property management company. In this case, a lack of owner approval for improvements may hinder electrification. Even in cases where the owner and property managers recognize the benefits to electrification projects, they are often a lower priority for management, where health and safety issues take priority. Additionally, organizational staff capacity issues may hinder electrification projects. Most property managers are hired mainly to interface with residents and ensure compliance with rent and income restrictions and other requirements established by the institutions that provided financing for the building. Because of these complications, any potential building

³⁹ "Housing Tax Credits." Minnesota Housing, 2021, <https://www.mnhousing.gov/sites/multifamily/taxcredits>.

electrification program or policy should attempt to make it as easy as possible for owners and property managers to participate.

Another consideration to take into account when planning to electrify existing multifamily buildings is the need to coordinate with residents. Building electrification could require shutting off the electricity and/or heat in common areas and individual units. Building electrification could also temporarily require owners to move residents (at owner cost) out of their units while work is taking place, and either move them into another unit in the building or into another building entirely. Giving residents advance notice about specific construction related issues and general communication with residents about project timelines and goals will be important.

Other Barriers

Electrifying New Construction

New construction presents a prime opportunity to incorporate electrified measures into the original design of a project, rather than having to undertake potentially time- and resource-intensive retrofit projects down the road. However, newer high-efficiency all-electric building technologies, such as heat pumps for space and water heating and induction stove tops, often have higher upfront costs than high-efficiency natural gas measures, such as furnaces and gas stove tops. On the other hand, eliminating the need for natural gas piping and metering could also provide cost savings opportunities. Thus, it remains unclear what all-in costs might amount to in new multifamily buildings.

It is also not clear whether electrification alone will lead to lower building lifecycle costs. Therefore, electrification done in tandem with traditional energy efficiency improvements could additionally lower lifecycle costs and provide a better return on investment for the owner and developer. The builder-developer-owner relationship may vary by project. Developers who also plan to own the building long term may be more interested in investing in building components that decrease lifecycle costs. However, even developers who plan to sell the building shortly after completion may find that electrification and efficiency could be a selling point.

Coordinating with Non-Utility Programs

Utility incentive programs may be one component to help electrify buildings. However, there are a large number of utilities in Minnesota, with each of them having multiple utility incentive programs. Multifamily building owners may face confusion when trying to determine which program best fits their needs: commercial vs. residential, prescriptive vs. custom, market-rate vs. affordable. Additionally, having one utility for electricity and another utility for natural gas may cause confusion over what package of incentives makes sense for the owner.

Similarly, other programs such as Commercial Property Assessed Clean Energy (C-PACE)⁴⁰, utility on-bill financing programs, and city-run programs may also be available to help pay for building electrification. However, these programs may have their own barriers that make participation difficult. For example, complicated applications, conflicting timelines, or program requirements that conflict with the main

⁴⁰ "MinnPACE," Saint Paul Port Authority, 2021, <https://www.sppa.com/portfinancing/minnpace>.

source of funding for projects may prevent the use of these programs as a main avenue to pay for building electrification.

Contractor Training and Knowledge

Contractors with the necessary knowledge specific to multifamily building electrification can be difficult to find, especially in greater Minnesota. Subcontractors such as HVAC professionals may be subcontracted from a large distance away from the building. Owners of multifamily buildings may be hesitant to install new and unfamiliar technology especially in situations where a local contractor is not available for regular maintenance and emergency issues.

Gentrification and Displacement

As buildings are constructed or upgraded, the risk of gentrification and displacement increases due to market forces from improved housing stock. After construction is finished, rents are often increased to help cover the construction costs. Under-resourced residents and households of color living in market rate or naturally occurring affordable housing (NOAH)⁴¹ are often the most at risk of being displaced due to rent increases. Sales of multifamily buildings and rental units in the Twin Cities have risen 147% between 2010 and 2015, with the average building price per unit rising 54% in the same period.⁴² Renter protections should be considered when making energy improvements to buildings.

⁴¹ The Greater MN Housing Fund defines NOAH as affordable unsubsidized rental properties. See <https://gmhf.com/finance/noah-impact-fund>.

⁴² "Sold Out," Minnesota Housing Partnership, October 2016, https://www.mhponline.org/images/Sold_Out_final_revised_small.pdf.

Opportunities to Encourage Electrification

Building Codes

Modernizing and strengthening the state’s building energy codes is one place the state of Minnesota could encourage electrification through its policies. Building energy codes are under the regulation of the Department of Labor and Industry (DLI). Currently, the state uses the 2018 International Energy Conservation Code (IECC) for commercial buildings and an amended 2012 IECC for residential buildings.⁴³ In Minnesota, multifamily buildings with four or more stories are regulated under the commercial code.⁴⁴ The DLI Commissioner and the Construction Codes Advisory Council are required to review and adopt new codes at least every six years.⁴⁵ Through this mandated regular review, Minnesota can utilize this opportunity to strengthen its building energy codes to reflect its climate goals. Though building codes only address new construction and major renovations, incorporating or mandating electrification into the code would certainly expedite widespread electrification in multifamily buildings.

There has been increased focus on the state’s building energy codes as of late, as it has become apparent that the buildings sector is falling short in meeting the state’s carbon reduction goals as outlined in the 2007 Next Generation Energy Act.⁴⁶ Figure 3 shows that while the state has made meaningful progress in reducing emissions in electricity generation, both the commercial and residential building sectors have seen their emissions rise 15% and 32% respectively from 2005 to 2018. The Walz administration and advocates have identified strengthening building codes as one potential way to achieve emissions reductions in these two sectors.

⁴³ 2020 Minnesota Energy Code with ANSI/ASHRAE/IES Standard 90.1-2016. April 2020. Available at <https://codes.iccsafe.org/content/MNEC2020P1>.

⁴⁴ The Minnesota Department of Commerce currently plans to implement the 2019 ASHRAE Commercial Code next year. See ASHRAE 90.1-2019 Standard Review, Minnesota Department of Labor and Industry. July 2021. Available at http://www.dli.mn.gov/sites/default/files/pdf/TAG_commercial_energy_code_report_071521.pdf.

⁴⁵ Minnesota Statutes 2020, section 326B.106, <https://www.revisor.mn.gov/statutes/cite/326B.106>.

⁴⁶ “Pathways to Decarbonizing Transportation in Minnesota.” Department of Transportation, August 2019, p.15, <https://www.dot.state.mn.us/sustainability/docs/pathways-report-2019.pdf>.

Figure 3. Change in Emissions by Sectors, 2005-2018⁴⁷



With that in mind, the state launched a stakeholder workgroup in 2019 to explore ways to improve building energy efficiency in multifamily buildings four stories and higher. The workgroup’s key recommendation: institute an adoption framework to enhance the commercial building energy codes to reach net-zero by 2036.⁴⁸ Additionally, the group suggested state and local governments could consider incentives, benchmarking policies, and enhanced code compliance.

Strengthening the code, with eventually arriving at net-zero construction, would certainly expand electrification in Minnesota. The code would require all new large construction multifamily buildings and all multifamily buildings undergoing substantial rehabilitation to be built all-electric in order to meet the code’s baselines. Implementing stretch codes, or codes that go beyond the statewide minimum standard, could contribute to increased electrification of multifamily housing as multifamily housing tends to be concentrated in cities that would be most apt to adopt and enforce a more stringent code. The workgroup report concluded that a statewide approach, rather than a piecemeal stretch code that varied municipality to municipality, would ultimately create deeper energy savings. Either way, stronger codes and stronger code compliance are avenues the state can take to expedite electrification.

⁴⁷ “Greenhouse gas emissions inventory 2005-2018.” Minnesota Pollution Control Agency, March 2021, <https://www.pca.state.mn.us/sites/default/files/lraq-1sy21.pdf>.

⁴⁸ “Improving building energy efficiency in commercial and multi-family construction.” Minnesota Department of Labor, December 2020, <https://www.dli.mn.gov/sites/default/files/pdf/BuildingsEnergyEfficiency2020.pdf>.

Program Design and Incentives

Community Engagement

To ensure equity is at the forefront of decarbonization strategies, it is important to consider the following steps, while also utilizing established community engagement guidelines and toolkits (mentioned below):

Determine preliminary program design criteria, eligibility, and define parameters. What constitutes “multifamily?” How would you determine an environmental justice area? Would you use a mapping tool like EPA’s EJSCREEN?⁴⁹ What is the income level threshold for income-qualified projects? Be sure to create a broad outline so revisions can be made with ease.

Start an education and outreach initiative, such as New York’s Clean Heat Program.⁵⁰

- Provide timely and meaningful community engagement and outreach. Request thoughtful feedback and conduct a significant amount of listening sessions. Provide translation, child care, food and monetary compensation, if possible.
- Another way to reach a broader audience and perhaps acquire more funding for electrification would be to partner across sectors and with state agencies, such as the Minnesota Department of Health. Messaging electrification as a public health initiative could educate more people on the importance of electrifying housing. Similar approaches have been successfully utilized with weatherization and “healthy homes” programs.⁵¹
- Be sure language is accessible and asset-based, not deficit-based. Talk about strengths and opportunities a community possesses, not disparities and problems that need to be “solved.”⁵² Community members should feel empowered when engaging in this process, not burdened or talked down upon.
- Collaborate with community leaders that will actively participate in the design process.

Take community feedback and suggestions back to the planning process. Establish official parameters of the program while keeping incentives flexible and minimally prescriptive so most projects can be eligible, according to lessons learned from the Low Income Weatherization Program for Multifamily (LIWP-MF) program in California.⁵³

⁴⁹ “EJSCREEN: Environmental Justice Screening and Mapping Tool.” U.S. EPA, 3 August, 2021, <https://www.epa.gov/ejscreen>.

⁵⁰ “Going Electric: Retrofitting NYC’s Multifamily Buildings.” Urban Green Council, April 2020, www.urbangreencouncil.org/sites/default/files/urban_green_going_electric_4.22.2020.pdf.

⁵¹ “Healthy Homes and Asthma: A healthy housing blueprint to improving asthma outcomes,” Green & Healthy Homes Initiative, December 2019, <https://www.greenandhealthyhomes.org/wp-content/uploads/GHHI-Healthy-Homes-Asthma-20191216.pdf>.

⁵² “The Power of Asset-Based Language,” Silicon Valley Social Venture Fund, 25 November 2020, <https://www.sv2.org/the-power-of-asset-based-language>.

⁵³ “Equitable Electrification: Program Models that Work for Existing Low Income Multifamily Buildings.” American Council for an Energy-Efficient Economy, 2020, p.13-115.

- One way to prevent rent increases and resident displacement is to receive a signed, enforceable agreement by the building owner and program administrator to keep rents affordable (define what that means) for a determined number of years.

Schedule regular check-ins with stakeholders and host more community sessions. Establish metrics for success (e.g. GHG emissions reduction, dollars saved, incidence of asthma attacks, frequency of hospital visits, comfort level of residents, etc.).

In order to reach broad participation particularly in under-resourced communities, it would be wise to follow Greenlining Institute’s five-step framework on community engagement and building electrification.⁵⁴ Another valuable resource that highlights the necessity for community members to lead in program design is The Spectrum of Community Engagement to Ownership. This resource gives varying scenarios of community engagement with a recommended process to follow.⁵⁵

Program Planning

Underserved Communities First

A critical approach to equitable electrification is to prioritize affordable housing in underserved communities, as demonstrated by the San Joaquin Valley’s pilot program.⁵⁶ This initiative identified a number of “environmental justice communities” (communities that bear a disproportionate burden of environmental pollution, socioeconomic stressors, and various health conditions) that were using propane and wood to heat their homes and installed electric appliances and heat pumps. This project prioritized using electricity as a fuel instead of natural gas and provided a substantial amount of savings to these communities already burdened by high housing and energy costs relative to their income. Instead of being “late adopters” due to the economic and program barriers discussed throughout this paper, these communities benefited first from a transition to clean electricity. In order to redress systemic policies and practices that have harmed such communities for decades, ensuring they benefit first from emerging clean technologies is a crucial step in the electrification process.

One thing to note about this pilot program is that it was available to both homeowners and renters; however, renters needed to get written permission from the property owner to participate. Therefore, to adequately serve multifamily properties and residents, building owners should be directly incentivized and the process should be streamlined. Incentives to contractors would also help alleviate some costs passed to the building owner. Another important reason for prioritizing under-resourced and BIPOC communities first is to ensure they do not bear the brunt of increasing natural gas costs as people switch to all-electric end-uses in homes. The costs of natural gas infrastructure will have to be spread

⁵⁴ “Equitable Building Electrification: A Framework for Powering Resilient Communities.” Greenlining Institute and Energy Efficiency for All, 2019, https://assets.ctfassets.net/ntcn17ss1ow9/4bcrgrRiiymPoVKoMDCqPz/8568c1dd9eec6545c901c3b035a77832/Greenlining_EquitableElectrification_Report_2019_WEB.pdf.

⁵⁵ Facilitating Power and Movement Strategy Center. *The Spectrum of Community Engagement to Ownership*. <https://www.cabq.gov/office-of-equity-inclusion/documents/spectrum-2-1-1-1.pdf>.

⁵⁶ “California Pilot to Wean 1,600 Homes from Fossil Fuels.” NRDC, 13 Dec 2018, <https://www.nrdc.org/experts/merrian-borgeson/california-pilot-wean-1600-homes-fossil-fuels>.

out to ratepayers remaining on the system, which if not proactively addressed, will disproportionately affect underserved communities.⁵⁷

Co-creation and Implementation

To ensure everyone's needs are met and no one, especially the renter, is left with additional unnecessary costs, an advisory group or task force could be created, where a representative from each sector of multifamily housing would be a member. This could include developers, building operators and/or owners, residents/renters, energy service providers/installers, contractors, utility representatives, and government representatives. These stakeholders could come together to create necessary criteria and incentives to help guide the program creation process.

Partnering with trusted community-based organizations is important, as is streamlining the electrification process. Community-based organizations are organizations (typically non-profits) that are established in a specific local area and work to improve services for, and the general wellbeing of, residents in that area. Trusted community-based organizations have existing relationships with communities and their advocacy or promotion of an electrification program could earn the trust of skeptical renters or landlords. One opportunity to further explore would be local workforce development and training for BIPOC communities. Ensuring that implementers have a diverse list of people to recruit, train, and hire, particularly from under-resourced communities, could improve the communities' economic well-being while strengthening relationships and potentially preventing displacement. Program implementation staff who come from the community they serve further aids in gaining trust and program effectiveness.

Program administrators and implementers are entities (either non-profit or for-profit) that hold technical expertise and have experience offering energy services to customers, working at the local, state, regional, or even national level. A streamlined program administrator is key to balancing the community's needs and the owner's needs, and for providing free technical assistance and timely communication to both parties. A single point of contact also makes the process less complicated and confusing. The "one-stop shop" approach to electrification would maximize all the different incentives that utility, state, and local programs could provide.⁵⁸ For example, the Center for Energy and Environment is a non-profit based in the Twin Cities that offers successful streamlined programming and research for both commercial and residential energy efficiency.⁵⁹ They and similar service providers could be potential allies and program implementers for electrification, as they have the technical expertise, workforce, and contractors that know how to install heat pumps. Program implementers can also play an important role in partnering with and funding community-based organizations to conduct outreach and engagement in their communities, leveraging trusted relationships to reach more households.

⁵⁷ "Equitable Building Electrification in Cities: How Cities are Centering Equity to Transition Buildings Away from Fossil Fuels." American Council for an Energy-Efficient Economy, 2020, p. 13-356.

⁵⁸ "One-Stop Shops for the Multifamily Sector." Energy Efficiency for All. https://assets.ctfassets.net/ntcn17ss1ow9/30B8LUDt8GTegjPE8claf/4b334a9fb7f2a5fa658e2f751c4e5575/EEFA_OneStopShop_Fact_Sheet_2_.pdf.

⁵⁹ Edwards, J. "Beneficial Electrification: CEE's 2020 impact." Center for Energy and Environment. 18 November, 2020, <https://www.mncee.org/beneficial-electrification-cees-2020-impact>.

Funding

Adequate funding is a major challenge for electrifying multifamily housing. Utility incentive programs, like rebate programs, are a popular option that have been used for energy efficiency upgrades, like installing Energy Star® appliances or heating and cooling measures. Rebates are not as effective in providing adequate cost-savings to under-resourced customers, however. It is more beneficial when financial incentives are distributed up front to both the owner and the residents. Both owners and renters may find it difficult to bridge rebates, meaning that it may be difficult to cover the upfront cost of the upgrades while waiting for the rebate to be provided after the upgrade has been completed. Residents already cost-burdened may not have a funding source, and many owners of NOAH are already limited with upfront capital. Larger multifamily buildings may have a budget for capital improvements, but perhaps not enough to cover costs of new technologies while keeping rent the same. Dedicated long-term funding pools should be considered, especially for BIPOC and under-resourced communities, along with owners of NOAH. State or federal funds could be leveraged to supplement existing utility program funding, and may be necessary to reach a greater number of households with low- or no-cost measures.

Another possibility for funding is equipment leasing. The owner can make incremental payments for the equipment installed so that the cost is manageable. Examples of such equipment are heat pumps, electric water heaters, and PV solar arrays. An energy company in New York, BlocPower, installs and leases the equipment for 15 years and guarantees continual maintenance and optimal performance. The type of equipment installed is project-specific, but air source heat pumps are a primary focus for BlocPower.⁶⁰ The combination of a longer-term partnership and communication from the energy company paired with smaller more flexible payments could make this model more attractive to building owners.

Legislation

Minnesota was somewhat unique in the Midwest with its prior prohibition on fuel-switching within the Conservation Improvement Program (the state's energy efficiency resource standard), as most states in the region do not have explicit policies encouraging or prohibiting electrification. Alaska, California, Massachusetts, New York, Tennessee, and Vermont are some of the states that have policies to encourage fuel-switching when it is cost-effective and reduces emissions.⁶¹ Three of these states-- Alaska, Massachusetts, and Vermont--used the legislature to codify these policies. The ECO Act is similar to these laws as the Act encourages electrification and treats it as a resource akin to energy efficiency.

The other legislative avenue that some states and jurisdictions have used is a goal to expedite adoption of a specific technology, like Maine has done to encourage widespread conversion to heat pumps. LD 1766 was signed into law in 2019 and set a goal for the state of Maine to install 100,000 heat pumps by

⁶⁰ "BlocPower." <https://www.blocpower.io>.

⁶¹ "State Policies and Rules to Enable Beneficial Electrification in Buildings through Fuel Switching." American Council for an Energy-Efficient Economy. May 2020, https://www.aceee.org/sites/default/files/pdfs/fuel_switch_revised_5-14-20.pdf.

2025.⁶² This goal may encourage more rapid and widespread electrification than policies that allow but do not mandate electrification, like the ECO Act.

Additionally, policies to ban natural gas have been proposed to prevent future natural gas infrastructure, which in turn effectively mandate electrification in new buildings. In July 2019, Berkeley, California became the first major city to pass an ordinance to ban natural gas hook ups in new construction.⁶³ Several municipalities have since followed Berkeley's lead and passed natural gas bans, with the majority of these cities in California. In response to these bans, several states have introduced bills to preemptively prohibit jurisdictions from passing bans on natural gas. With a split legislature, it is unlikely that Minnesota will seriously consider, let alone enact, a statewide natural gas ban for some time. It is equally as unlikely that the legislature will pass a preemptive ban on municipal natural gas bans. Minnesota led the Midwest with 12,853 construction permits for new multifamily units in buildings with five or more units, so a ban on new natural gas infrastructure would certainly expedite electrification of multifamily buildings.⁶⁴ That being said, a natural gas ban is not likely to factor into Minnesota's policy considerations in the near future, in part due to the performance of electric heating equipment in Minnesota's cold climate as discussed above. Despite this, there are other ways to encourage electrification through the legislature or administrative rulemaking. Minnesota's B3 Sustainable Building 2030 (SB 2030) Energy Standard mandates that buildings receiving state general obligation bond funding must comply with energy and carbon goals, which in turn encourages energy efficiency, on-site renewable generation, and electrification.⁶⁵

While the ECO Act will likely lead to increased opportunities to electrify multifamily units, the ECO Act does not explicitly address electrification in multifamily housing stock. Since ECO does not encourage electrification in one sector over another, there is nothing in the law to prevent utilities from prioritizing electrification in the industrial sector, though utility plans are reviewed by the Department of Commerce at the portfolio level to ensure balanced programming by segment. Though ECO will give rise to electrification, it remains to be seen how and when utilities and the building owners and developers will tackle electrification of multifamily buildings.

Since there are few examples of encouraging electrification of multifamily units in law, Minnesota may be best served to study how it and other states have aimed to serve multifamily units with energy efficiency programs. Offering robust energy efficiency programs to renters of multifamily buildings has required targeted attention of the state's lawmakers, regulators, and utilities. Electrifying these units will require the same attention. With a lack of a legislative playbook, Minnesota will need a concerted effort to ensure that the benefits of electrification are accessible to these populations while also ensuring that multifamily renters do not suffer unintended consequences.

⁶² "An Act To Transform Maine's Heat Pump Market To Advance Economic Security and Climate Objectives." Maine Legislature, LD 1766, https://www.mainelegislature.org/legis/bills/bills_129th/billtexts/SP059701.asp.

⁶³ Berkeley, California City Council Meeting. July 16, 2019. http://berkeley.granicus.com/MediaPlayer.php?publish_id=70986fb1-a8be-11e9-b703-0050569183fa.

⁶⁴ Building Permits Survey. United States Census Bureau. May 2021, <https://www.census.gov/construction/bps/stateannual.html>.

⁶⁵ "B3 Sustainable Buildings 2030 Energy Standard." Minnesota Buildings, Benchmarks & Beyond. 2017, <https://www.b3mn.org/2030energystandard>.

State and City Programs and Policies

New construction and rehabilitation projects could be made easier for housing developers and owners through incentive and financing processes through city or state housing agencies.

State Housing Finance Agencies

One opportunity is to advocate for state Housing Finance Agencies to align their programs and policies with climate, sustainability, and resiliency goals. This includes participating in public comment and technical advisory opportunities to influence sustainable building standards and Qualified Allocation Plans (QAPs). The QAP is the state Housing Finance Agency plan for how to distribute funds. At the Minnesota Housing Finance Agency up to five QAP selection points are available for projects that follow one of the enhanced sustainability pathways, which include building electrification components.⁶⁶

City Housing Programs

At the local level, housing programs provide an opportunity to preserve and upgrade housing stock, maintain affordability for renters, and encourage energy investments. For example, the City of Minneapolis currently offers the 4d Affordable Housing Incentive Program, which provides an approximate 40% tax rate reduction on qualifying rental property units for 10 years in exchange for property owners agreeing to keep at least 20% of rental units affordable to households whose income is at or below 60% of Area Median Income.⁶⁷ Importantly, property owners also receive support to undertake energy assessments in their properties, with additional incentives for energy efficiency and solar projects.

The 4d Affordable Housing Incentive Program could be a valuable model to expand and replicate to encourage electrification in affordable rental properties.



⁶⁶ “2022-2023 Self-Scoring Worksheet.” Minnesota Housing. December 2020, https://www.mnhousing.gov/sites/Satellite?blobcol=urldata&blobheadname1=Content-Type&blobheadname2=Content-Disposition&blobheadname3=MDT-Type&blobheadvalue1=application%2Fpdf&blobheadvalue2=attachment%3B+filename%3DMHFA_238916.pdf&blobheadvalue3=abinary%3B+charset%3DUTF-8&blobkey=id&blobtable=MungoBlobs&blobwhere=1533152627505&ssbinary=true.

⁶⁷ “4d Affordable Housing Incentive Program.” City of Minneapolis. 20 May 2021, <https://www2.minneapolismn.gov/government/programs-initiatives/homes-development-assistance/4d-affordable-housing/>.

Conclusion

While this paper seeks to provide a broad discussion of the considerations related to electrification in multifamily buildings, the topics discussed in this paper are not exhaustive, and the authors recognize that the complexities of each benefit, barrier, and opportunity of electrification in multifamily housing in Minnesota warrant more in-depth analysis. The passage of the ECO Act allows further exploration into fuel switching and will require more investment by utilities to better serve under-resourced households. Despite the challenges that each barrier brings, the benefits of mitigating climate change, better serving BIPOC and under-resourced communities, and reducing negative health impacts all are major positive outcomes of electrification in multifamily housing in Minnesota.

As policies are implemented, robust electrification programs are created, and more examples of electrified multifamily housing emerge throughout the state, there will be a need to reevaluate such strategies while centering equity. Reducing racial and socioeconomic disparities, preventing increased energy burdens in under-resourced households, and preventing displacement and gentrification must be at the forefront of the energy transition. Minnesota has a major opportunity to align its climate and equity goals with clean energy strategies and technologies in the multifamily housing sector.

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