Well-Suited Energy Efficiency

Tailoring Programs for Multifamily Buildings

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February 13, 2016

MEEA
MIDWEST ENERGY EFFICIENCY ALLIANCE

Acknowledgements

This paper was made possible by the generous support of the Energy Foundation. The primary authors of this paper are Gregory Ehrendreich and Julia Friedman of the Midwest Energy Efficiency Alliance. The authors would like to thank and acknowledge Michael Brandt, Scott deBlois, Jim Miller, Anne McKibbin, Yvonne Pfeifer, Katherine Teiken and Dan York for discussion and/or external review. Note that external review and support do not imply affiliation or endorsement. Additionally, the authors are grateful for the contributions of MEEA staff in internal review and document production.

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Executive Summary

Energy efficiency has the potential to achieve significant energy savings and deliver bill savings, among other benefits, to multifamily building owners and residents. To unlock this potential, program administrators must design energy efficiency programs that are responsive to the unique needs of this customer segment. The Midwest is home to a significant stock of multifamily buildings that represent a huge energy savings opportunity.

Multifamily housing makes up 11 to 22% of the housing stock in Midwest states. The majority of multifamily housing is renter-occupied, and a large proportion of those renters are low-income customers for whom the cost of high utility bills is the most burdensome.

Energy efficiency programs have traditionally had a difficult time reaching multifamily customers due to systemic barriers that include split incentives, time and resource constraints, complex decision-making structures and difficulties in marketing and outreach to these customers. Modifications to program design and delivery can help to overcome these barriers.

Multifamily energy efficiency programs in the Midwest come in a variety of formats – from general offer programs that include multifamily as one eligible customer type (referred to herein as MF-Inclusive programs), to multifamily-specific programs that directly target those customers (MF-Exclusive programs). There are multifamily programs for low-income and higher-income residential customers, as well as programs that bring energy efficiency measures to the common areas of multifamily buildings through commercial sector programs.

Program Classification	Description
MF-Inclusive (MFI)	General programs targeted at a broad audience, of which multifamily is one eligible customer type.
MF-Exclusive (MFE)	Programs specifically targeted at multifamily building customers.

Energy efficiency measures for residential multifamily units are typically in the form of rebates on or installation of energy efficient products, most commonly lighting, weatherization and hot water-saving measures. For common areas of multifamily buildings, direct install is still most prevalent, but there is the potential for deeper energy savings through HVAC and building envelope retrofit measures for existing buildings and efficiency enhancements for new construction.

We examine the mixture of multifamily energy efficiency programs in four states – Indiana, Ohio, Minnesota and Iowa – since 2010. These states are not the only states working on multifamily energy efficiency in the Midwest, but they provide a good

contrast in terms of energy efficiency policies and performance, as well as having sufficient available data for the analysis. Key findings from this analysis of the four states include:

- There is a gradual shift toward MF-Exclusive programs, and these programs are growing as a percentage of total energy efficiency portfolios.
- MF-Exclusive programs account for 1.3 to 6.0 percent of annual electric energy efficiency spending and provide 0.3 to 2.9 percent of annual electricity savings.
- MF-Exclusive programs account for 2.3 to 4.1 percent of annual natural gas energy efficiency spending and provide 1.4 to 3.6 percent of annual natural gas savings.
- Multifamily customers make up about 8 to 12 percent of participants in MF-Inclusive programs (based on very limited data).
- The proportion of spending on multifamily programs compared to the total spending on all energy efficiency programs is substantially lower than the proportion of multifamily to single-family housing.
- The shift toward MF-Exclusive programs and the growth of multifamily programs as a component of energy efficiency portfolios is strengthened by a stable, long-term energy efficiency policy environment, where programs can mature over time and be tailored based on performance and evaluation over successive program cycles.

The trends in multifamily building energy efficiency observed in these states are promising. The increase in MF-Exclusive program for both electric and natural gas customers and the rise of programs that seek deeper energy savings from all parts of the building shows that these traditionally hard-to-reach customers are getting closer to seeing the same benefits of energy efficiency that their single-family housing peers have been accruing. To improve delivery and accessibility of energy efficiency to multifamily buildings, we recommend that utilities, program implementers and policymakers:

1. Examine the multifamily housing market in their territories. This paper looks at statewide trends, but recognizing the differences within individual utility territories, such as higher proportions of multifamily customers in cities than in rural areas, will help utilities to tailor their program design and implementation to increase their reach into the multifamily market.
2. Track the participation of, spending on, and savings achieved by multifamily customers within MF-Inclusive programs if possible, or consider program design/tracking changes that would make this possible. This would shed light on how well these broad programs are actually reaching multifamily customers.
3. Track the ways in which a multifamily customer participates in residential and commercial programs to understand how savings are achieved and whether there are opportunities to attain additional savings. For example, direct

installation of a few lightbulbs may count as a multifamily participant, but such 'light touch' programs may be leaving substantial cost-effective energy efficiency savings on the table. Multifamily energy efficiency needs a balance between programs that reach many customers and programs that provide deeper savings where the need is greatest.

4. Expand the availability of MF-Exclusive programs, especially programs that offer whole-building, deep energy savings. This can be taken a step further with the delivery of one-stop shop programs (combining whole-building, in-unit, common area, and building envelope gas and electric measures). These programs designs can make participation easier for building owners with a single program to navigate rather than multiple stand-alone programs with multiple points-of-contact.
5. Evaluate how changes in energy efficiency policy will affect program operations, particularly for programs that disproportionately assist low-income and vulnerable communities.
6. Assess issues of equity among customers surrounding access and implementation of energy efficiency programs. Metrics that measure equity could be incorporated into program design and evaluation.

Introduction

Multifamily Housing Sector in the Midwest

Improving the energy efficiency of the existing multifamily building stock is important given the size of the market in the Midwest, the potential for savings, and the socioeconomic characteristics of the residents living in many of these buildings. Multifamily housing, defined here as buildings with 5 or more residential housing units, constitutes a substantial portion of the housing stock in the Midwest – with percentages ranging from a low of 11% in Kentucky to up to 21% and 22% in Illinois and North Dakota, respectively, with an average of 15% for the region. These statewide totals average both rural and urban areas. Within individual utility service territories, the percentage of multifamily housing can be substantially higher. *Figure 1* shows multifamily housing stock as a percentage of total housing in each state in the Midwest.

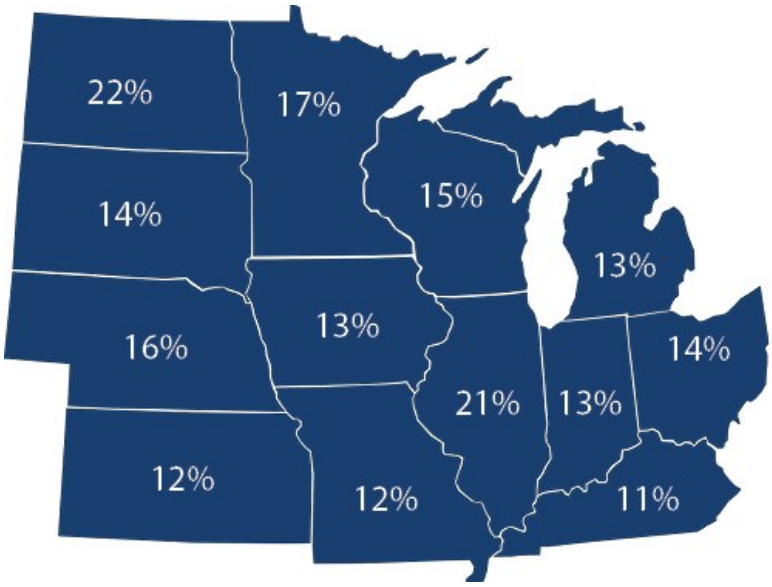

Figure 1: Multifamily housing as a percentage of total housing stock in Midwest states [i]

Within this building sector, there are substantial untapped potential energy savings. Studies have shown achievable energy savings of 22-31% in multifamily affordable housing.[ii]

The size of the sector and the potential for savings alone demonstrate the need to deliver energy efficiency – and the associated economic, environmental, and health benefits – to multifamily building owners and residents. This need is compounded by the fact that in the Midwest 87% of multifamily housing is rental housing,[iii] and national data shows that a quarter of multifamily renters earn less than $15,000 per year and nearly

half earn less than $30,000 per year.[iv] In nationwide analysis of low-income[1] multifamily housing the median energy burden, the cost of utility bills in proportion to income, is 5%, as compared with 3.5% for all-income, all-housing and only 1.5% for higher-income multifamily.[v] The energy burden is even starker for the lowest-income households. For households below 50% of the federal poverty level, the energy burden can be much higher: Indiana, 30% of income; Iowa, 29%; Minnesota, 33%; and Ohio, 30%.[vi] Increasing the accessibility and impact from multifamily energy efficiency is a direct path to helping those who need it the most.

This paper explores the composition and evolution of multifamily programs offerings in four states – Indiana, Ohio, Minnesota and Iowa – since 2010. The analysis looks at investment, energy savings and program models offered in each state. We selected Iowa and Minnesota for study because they are states with a long history of energy efficiency and stable energy efficiency policies. Indiana and Ohio, on the other hand, are states with relatively new energy efficiency policies that have undergone recent structural changes. All four of these states have sufficiently detailed program-level energy efficiency data available for analysis.

We begin with a brief discussion of the difficulties program administrators have reaching multifamily customers with energy efficiency. Then follows a discussion of scope and terminology of the study. Next, there is a review of the types of energy efficiency measures seen in multifamily energy efficiency program categories. The paper then reviews the energy efficiency policy landscape in each of the examined states. Taking all of that information as context, we then present the findings from the state-by-state analysis, providing detail on the mix of multifamily program types seen in each state and the shifts over time toward greater diversity of program types and more focused multifamily offerings. Finally, we discuss broad trends suggested by the findings and makes recommendations for program administrators, implementers, and policymakers to increase understanding of multifamily energy efficiency and to continue to improve program delivery and reach.

Barriers to Energy Efficiency in Multifamily Housing

There have been several recent publications detailing the barriers to multifamily energy efficiency and policy and program design approaches to overcome those barriers.[vii,viii] Despite the recognized need, there are challenges to achieving participation in multifamily energy efficiency programs. At the most simplified level, these challenges come from:

- *Split incentives*, which arise when a building owner pays for upgrades where savings accrue to residents who pay their own utility bills

[1] Defined in the referenced report as less-than or equal to 80% of the area median income (AMI), however the definition of "low-income" varies among programs; see Appendix A.

- *Time and resource constraints*, where efficiency has to compete with other building upgrades and maintenance for limited available capital and limited knowledge of energy and efficiency issues make it difficult for owners to dedicate time to efficiency projects or coordinate resident participation;
- *Complex decision making structures*, where multiple levels of approval (owners, managers, staff and/or residents) are required before work can begin and decision-making authority does not rest with a single person/body;
- *Marketing and outreach*, where overlapping utilities for gas and electric, mixtures of residential and commercial program eligibility, and difficulty reaching decision makers can create confusion and lower participation rates.[ix]

There is no "one size fits all" approach to overcoming these barriers. It requires energy efficiency program administrators to understand their service territory and the characteristics of the multifamily customers in their market.

Data Collection & Terminology

As stated earlier, we define "multifamily buildings" as those with five or more residential units. This is consistent with many utilities' definitions used for program eligibility, and with the segmentation of housing sizes in the US Census Bureau's American Housing Survey. This leaves out 2-4 unit buildings, but in the case of utility energy efficiency these customers are often eligible for single-family programs.

Due to differences in energy efficiency policies from state to state, electric energy efficiency programs from investor-owned utilities (IOUs) present the broadest comparability across the Midwest and the states examined. Though there are small voluntary natural gas energy efficiency efforts in Indiana and Ohio and some energy efficiency offerings from municipal and cooperative utilities, the energy efficiency resource standards (EERS)[2] for those states were only for electric IOUs, and detailed data for those programs is most readily available for analysis. Unlike Indiana and Ohio, however, Iowa and Minnesota both have strong natural gas energy efficiency portfolios and significant program offerings from municipal and coop utilities. The analysis includes an examination of multifamily programs from natural gas utilities in Iowa and Minnesota, but municipal and cooperative utilities were outside of the scope of the project.

[2] An Energy Efficiency Resource Standard (EERS) is a state policy that allows utilities to invest in energy efficiency to meet a portion of their customers' energy needs rather than through supplied energy. Depending on the jurisdiction of the utility regulator, an EERS can apply to only investor-owned utilities or can include municipal and co-op utilities. In some states the EERS applies only to electric utilities, and in others applies to both electric and natural gas. The use of an EERS to require customer-funded investment in energy efficiency provides a stable funding base for energy efficiency programs and can drive long-term energy savings within a state.

Sources for this paper included docketed utility plans (see Appendix A) and reports filed with state regulatory commissions and other commission-level reports, supplemented with data collected in E Source's DSM Insights database[x].

This study takes a conservative approach to determining which energy efficiency programs in utility portfolios serve the multifamily market. If the word 'multifamily' is in the program name or program description as an eligible participant, then it was included in this report. We applied this rule to both residential and commercial sector programs. The study also addresses only "customer contact" programs that involve interaction between the utility or program administrator and the customer in the form of measure installation, rebates, etc., excluding "non-contact" programs such as point-of-sale buy-downs or other upstream programs.

We identified two broad categories of multifamily energy efficiency programs. The terms in *Table 1* are used in this paper to differentiate between these programs by how closely they target multifamily customers.

Table 1: Terminology used in this paper to classify multifamily energy efficiency programs by target

Program Classification	Description
Total Multifamily (Total MF)	All programs operating in the multifamily space, both multifamily-inclusive and multifamily-exclusive programs
MF-Inclusive (MFI)	General programs targeted at a broad audience, of which multifamily is one eligible customer type
MF-Exclusive (MFE)	Programs specifically targeted at multifamily building customers

In addition to classifying multifamily programs by how closely they focus on multifamily customers, multifamily programs can also be classified by various customer sectors within a utility energy efficiency portfolio. Multifamily programs can be included in residential or commercial energy efficiency sectors, depending on the nature of the program – for example whether it focuses on in-unit measures (residential) or on increasing efficiency in common areas (commercial). This paper categorizes multifamily energy efficiency programs by sector as shown in Table 2.

Table 2: Terminology used in this paper to sub-classify multifamily energy efficiency programs by customer sector

Sector[3]	Description
MFI-Residential	MF-Inclusive program contained in the utility's residential sector portfolio
MFI-Commercial	MF-Inclusive program contained in the utility's commercial and industrial (C&I)portfolio
MFI-Low-income	MF-Inclusive program that serves low-income customers (often part of the residential portfolio)
MFE-Residential	MF-Exclusive program contained in the utility's residential sector portfolio
MFE-Commercial	MF-Exclusive program contained in the utility's C&I portfolio
MFE-Low-income	MF-Exclusive program that serves low-income customers (often part of the residential portfolio)
MFE-XSector	MF-Exclusive program that delivers both residential and commercial sector components

Though low-income programs are generally considered to be part of a utility's residential sector portfolio, clear distinctions are made between the low-income and general offer programs in utility planning and reporting. Low-income programs serve societal and policy goals beyond simply saving energy and are often required by legislation or regulation to be included as part of a utility energy efficiency portfolio. Utility regulators often do not require low-income energy efficiency programs to meet the same criteria for cost-effectiveness required for standard-offer energy efficiency programs. MFE-Low-income can be the only reach into the multifamily space for some utilities, and is therefore included in this analysis.

A new approach for the Midwest is the cross-sector approach – delivering residential (in-unit) and commercial (common area and building envelop) measures in tandem to achieve a deeper level of savings. Only one utility has officially categorized its multifamily program as cross-sector, though some utilities offer complementary multifamily programs in tandem through their residential and commercial portfolios to achieve deeper savings throughout a multifamily building.

Additionally, a growing number of multifamily energy efficiency programs in the Midwest are joint gas-electric programs that deliver electric and natural gas savings either within a single dual-fuel utility or between separate gas and electric utilities with

[3] This list includes only sector definitions for identified programs – thus "MFI-XSector" was not included in the list as no programs were identified that fit that classification.

overlapping service territories. As with cross-sector approaches, the dual-fuel approach simplifies program delivery and helps provide more savings to customers.

Cross-sector and dual-fuel programs, taken together as "one-stop shop" programs, have the potential to enhance program cost-effectiveness through decreased labor costs associated with measure delivery and installation as compared with multiple, independent programs. It makes sense, when possible, to install electricity and natural gas-saving measures in both residential and common-area sections on a single visit, minimizing delivery cost and burden to the owner while maximizing savings.

Efficiency Measures in Multifamily Programs

There are a number of common program models for multifamily buildings. These program models offer different levels of energy savings, from low-cost, low-saving programs like direct install and product rebates, to higher-cost, higher-saving programs like retrofits for existing buildings and new construction programs. The mix of energy efficiency measures in multifamily programs is not vastly different between the residential and commercial sectors, as shown in Table 3. Whether in-unit residential or common-area commercial programs, the majority of programs offer energy efficient lighting and other efficient products via direct install or as rebates. As national lighting baseline standards become more stringent, this traditional pool of savings will decrease and broader diversity of measures will be important for these programs.

However, only MFE-Commercial and MFE-XSector programs offer building retrofit measures. Retrofits – such as building envelope and mechanical system improvements – have the potential to achieve greater savings per building than are available from more limited direct install and prescriptive rebate programs.[xi] Some of the MF-Exclusive programs aimed at the commercial sector, including MFE-Commercial and MFE-XSector, listed retrofit measures as a component of the program design. Programs that offer deep retrofits of building systems have achieved 23% electric and natural gas savings for one East Coast program administrator and 29% electric savings for another on the West Coast[xii], significantly higher savings per participant building than in other program approaches.

Table 3: Program and measure types found in the program descriptions from different classifications of multifamily energy efficiency programs in the Midwest

Classification	Program/measure types
MFI-Residential	• Prescriptive Rebates • Direct Install • Lighting • New Construction • Appliance Recycling • Demand Reduction
MFI-Low-income	• Direct Install • Lighting • Weatherization
MFI-Commercial	• Prescriptive Rebates • Custom Rebates • Lighting • New Construction • Energy Analysis • Design Assistance
MFE-Residential	• Prescriptive Rebates • Direct Install • Lighting • Demand Reduction
MFE-Commercial	• Prescriptive Rebates • Custom Rebates • Lighting • Direct Install • **Retrofit**
MFE-XSector	• Product Rebates • Direct Install • Lighting • New Construction • **Retrofit**

In addition to being able to better tune program measures to the needs of multifamily customers, MF-Exclusive programs also provide a better picture of how well the multifamily customers are being served. All participants in an MF-Exclusive program are, by definition, multifamily customers. Contrast this to the MF-Inclusive programs which serve a broader spectrum of customers – though there is not much hard data, what data is available indicates that participation levels in MF-Inclusive by multifamily customers are low compared to single-family customers. While MF-Inclusive programs

are still bringing valuable savings to utility portfolios, the shift toward MF-Exclusive programs gives greater promise for delivering the benefits of energy efficiency to multifamily customers.

Overview of State Energy Efficiency Policies

Energy efficiency policies vary widely among states. Policies can also change drastically over time, as is the case with Indiana and Ohio. In other states like Iowa and Minnesota, policies have been relatively stable, leading to sustained investment in energy efficiency over time.

Indiana

In 2009, the Indiana Utility Regulatory Commission issued their Phase II Order in Cause No. 42693 ("Phase II Order"), ruling that the state's electric utilities file demand side management plans to meet an energy efficiency resource standard (EERS) ramping up from achieving 0.3% of demand via energy efficiency in 2010 to 2.0% in 2019. Prior to the Phase II Order, Indiana utilities had the ability to offer energy efficiency programs to their customers, but actual program offerings were minimal. Between 2010 and 2014, a statewide program called "Energizing Indiana" increased Indiana's energy efficiency savings by 1398%.[xiii]

On March 27, 2014, Indiana's governor allowed Senate Bill 340 to become law, which overturned the EERS and ended Energizing Indiana. Overall, planned statewide energy efficiency savings in Indiana fell about 25% between 2014 and 2015 and have been flat through 2016.

Ohio

In 2008, Senate Bill 221 established an electric EERS for the state of Ohio. Savings requirements began in 2009, ramping up to a requirement of 2.0% annual energy efficiency in 2019. Due to the legislative language and the commission rules to implement the standard, compliance benchmarks require the meeting of cumulative targets, rather than annual incremental savings. Utilities are responsible for administration of all of their own programs, different from the statewide administrator model that Indiana adopted to implement its energy efficiency standard.

In 2014, SB 310 put in place a two-year 'freeze' on the energy efficiency standard and allowed large industrial customers to opt out of utility efficiency programs. Under SB 310, annually-increasing energy efficiency requirements would continue to be applied for utilities that elected to continue with their existing plans, and for utilities that chose to amend their plans the requirements were frozen at the 2014 requirement of a cumulative reduction of 4.2% savings achieved since 2009. AEP, Duke and DP&L chose to continue their existing plans, while First Energy amended their plan to take credit for cumulative savings already achieved and eliminate all new energy efficiency for the

duration of the freeze. The freeze ended in 2016 and the governor vetoed a bill that would have extended it.

Iowa

Iowa has a decades-long history of energy efficiency programs. The Iowa Utility Board's statutory authority to issue rules pertaining to energy efficiency dates to circa 1980, and the Iowa Legislature enacted the law that established current efficiency standards in 2007. Iowa does not have a hard target for energy efficiency savings. Rather, the IUB sets a binding target for each utility based on the utility's submission of their assessment of energy usage and potential savings. Both rate-regulated and non-regulated utilities are required to establish energy efficiency plans.

In response to the standards that went into effect in 2008, there was an increase in energy efficiency in Iowa, though because there was already a history of energy efficiency in the state the increases were not as dramatic as seen in states like Indiana and Ohio that started with little-to-no historical energy efficiency.

Minnesota

Minnesota is one of the leading energy efficiency states in the Midwest. Since 2007's Next Generation Energy Act, Minnesota's Conservation Improvement Program (CIP) policies required robust energy efficiency portfolios and detailed reporting from all of the state's electric and natural gas utilities. Minnesota's utilities have been required to meet 1.5% of average retail sales through energy efficiency since 2010, but can petition to have that standard lowered to 1.0% depending on a potential study or other factors. The regulator has allowed this reduction for natural gas utilities, though electric utilities remain at the 1.5% standard. Utilities are also required as part of their CIP to invest 0.2% of electric and 0.4% of natural gas residential gross operating revenues in low-income programs.

Findings

Summary of Findings

Multifamily Energy Efficiency Program Mix

A common trend in the four states examined is a change over time of the mixture of multifamily energy efficiency program offerings, both for the electric and natural gas sides. In all of the states except Iowa, earlier years have only one or two classes of programs that are able to reach multifamily buildings, either in the form of low-income programs or MF-Inclusive residential programs. Iowa stands out in this regard for two reasons – it has a broader mixture of multifamily program classifications throughout the state in earlier years, and it also has a substantially higher proportion of its historic multifamily programs coming from the commercial sector than is seen in the other states.

Multifamily Energy Efficiency Spending

We looked at two indicators to show the trends in energy efficiency program spending in the multifamily market:

- The distribution of multifamily energy efficiency spending among the different program categories; and
- The percent of total energy efficiency investment going to multifamily programs.

Multifamily energy efficiency spending has generally risen in the states that were ramping up energy efficiency programs in response to newly enacted energy efficiency standards. More muted changes occur in the states with longer-term efficiency policies. Total MF spending, both MF-Exclusive and MF-Inclusive programs, in the four states was approximately $32 million out of total energy efficiency spending of $439 million for electric and natural gas energy efficiency combined. MF-Exclusive spending across the four states was approximately $15 million in 2016, up from only $1.5 million in 2010. Though the Total MF and MF-Inclusive metrics are useful for big picture context and understanding the restructuring over time, the MF-Exclusive spending is the most important in that it best represents program dollars actually reaching multifamily customers. In some of the states, by 2016 MF-Exclusive programs have equaled or exceeded the spending on MF-Inclusive programs. In the states where that has not yet occurred, it appears that the trend is there and will occur in a few more program years.

Multifamily Energy Efficiency Savings

Energy efficiency savings follow the same patterns as energy efficiency spending, though to a somewhat lesser magnitude. There is a proportionate increase in savings from an increase in spending but with greater variability utility-to-utility and program-to-program. Considering that a substantial portion of multifamily programming is in low-income energy efficiency, the fact that savings do not increase as quickly as spending is not surprising. Low-income programs typically have low-to-zero participant contribution to the cost, with the full cost being borne by the program administrator, coupled with measures that have relatively low savings per participant. Programs that are not low-income tend to have a stronger response in program savings to changes in program spending than the low-income programs do.

Total MF energy savings across the four states in 2016 were an estimated 116 GWh, out of total energy efficiency savings of 2,267 GWh, and 18.8 million therms out of 41.6 million total therms saved. MF-Exclusive programs accounted for 25 GWh and 0.8 million therms of those savings.

Minnesota and Iowa have achieved electric savings from MF-Exclusive programs that exceed the savings from MF-Inclusive programs. Savings trends in Indiana and Ohio are not as clear, which, considering the policy changes and the uncertain future of energy efficiency policy in those states, is not surprising. MF-Exclusive programs are on the rise

as a percent of overall efficiency funding in those states, but it will require data from additional program years to show the true savings impact of the changes. On the natural gas side, savings from MF-Inclusive programs still dominate, but MF-Exclusive natural gas programs in Minnesota and Iowa are growing alongside the electric programs.

Summary

Looking at these metrics across the four states, we can say that:

- There is a gradual shift toward MF-Exclusive programs, and these programs are growing as a percentage of total energy efficiency portfolios.
- MF-Exclusive programs account for 1.3 to 6.0 percent of annual electric energy efficiency spending and provide 0.3 to 2.9 percent of annual electricity savings.
- MF-Exclusive programs account for 2.3 to 4.1 percent of annual natural gas energy efficiency spending and provide 1.4 to 3.6 percent of annual natural gas savings.
- Multifamily customers make up about 8 to 12 percent of participants in MF-Inclusive programs (based on very limited data).
- The proportion of spending on multifamily programs compared to the total spending on all energy efficiency programs is substantially lower than the proportion of multifamily to single-family housing.
- The shift toward MF-Exclusive programs and the growth of multifamily programs as a component of energy efficiency portfolios is strengthened by a stable, long-term energy efficiency policy environment, where programs can mature over time and be tailored based on performance and evaluation over successive program cycles.

Multifamily Energy Efficiency Spending

Utility energy efficiency programs are required to have a positive benefit-cost ratio; they offer a return on investment through cost savings, bill savings and other benefits to both the utility and the customer. Sometimes the investment in energy efficiency is mandatory and other times factors such as customer satisfaction or load management motivate utilities to adopt energy efficiency. In either case, utilities invest substantial amounts of ratepayer funding in energy efficiency programs. This section examines how much of that investment is in programs for multifamily customers.

Distribution of Electric Spending Among Multifamily Efficiency Program Categories

As discussed previously, this analysis considers two broad categories of multifamily customer programs – MF-Inclusive programs where multifamily is one eligible customer class, and MF-Exclusive where multifamily is the only eligible customer class. The

following section details each state's distribution of multifamily energy efficiency spending between those categories and among customer sectors.

Indiana

As shown in Figure 2, the majority of the multifamily electric energy efficiency in Indiana comes from MF-Inclusive programs, shown in shades of blue. The bulk of the MF-Inclusive program spending is on programs for residential customers with a small portion reaching specifically for low-income customers.

MF-Exclusive programs, shown in shades of green, also play a role in the utilities' portfolios, though. The MF-Exclusive programs have lost some ground as program offerings changed in response to the repeal of the statewide EERS. However, the addition of a new MFE-Commercial program by one utility subsequent to the repeal demonstrates that there remains a recognition of the need to seek new approaches to provide energy savings for this segment of Indiana's housing market.

Ohio

As shown in Figure 2, the majority of spending by Ohio's electric investor-owned utilities[4] on multifamily energy efficiency is in the form of MF-Inclusive programs. The first programs to come online were MF-Inclusive residential programs, with low-income programs added in subsequent years. In 2015-2016, one utility has expanded their multifamily programs into a MF-Exclusive cross-sector (reaching both residential and commercial sector areas of buildings) offering that uses a single program to bring measures to both residential spaces and commercial common areas in an attempt to reach deeper into this underserved sector of the housing market.

Iowa

Iowa has the most diverse mix of multifamily energy efficiency programs among its utilities of the states examined. Both MF-Inclusive and MF-Exclusive programs are offered in the state for residential, low-income and commercial electric customers (Figure 2). Historically, the highest proportion of the spending has been on MFI-Commercial programs, but over the past few years there has been significant movement into MF-Exclusive programs, especially those for the residential sector. Iowa has a much higher proportion of non-low-income, MF-Exclusive programs than the other states. The shift toward higher proportion of MF-Exclusive to MF-Inclusive is important because it means that there is stronger focus on reaching the multifamily customers.

Iowa's two electric IOUs are also natural gas suppliers and the multifamily programs from these utilities offer both electric and natural gas-saving measures (except in the

[4] Because of difficulties with the way they report their data, First Energy is not part of the analysis of multifamily spending and savings in Ohio. They have administered multifamily programs, primarily MF-Inclusive Low-income and Residential; however, quantification of the energy savings impacts at the program level was not practical from reported data.

case of a MF-Inclusive refrigerator recycling program that is electric-only). These dual electric-gas programs make it easier for buildings to achieve deep energy savings without having to manage participation in multiple programs.

As previously noted, the high proportion of MFE-Commercial programs is especially valuable because these are they type of programs that have the potential to impact areas like building envelope and mechanical systems that are not affected by residential in-unit direct install. Retrofit programs also can have a strong crossover between electric and natural gas savings.

Minnesota

Due to a statutory requirement for annual low-income efficiency spending, low-income programs have historically been a large component of Minnesota's multifamily electric energy efficiency spending (Figure 2). In recent years, some of the state's utilities have developed new programs to reach additional multifamily customers through increased multifamily eligibility for residential programs and new MF-Exclusive programs. For the past three years, almost 60% of the spending on multifamily-eligible programs has been on MF-Exclusive programs.

There is only one dual electric-gas utility in Minnesota offering multifamily programs, which historically offered programs in the MFI-Low-income and MFI-Commercial categories. A new cooperative MF-Exclusive program between that utility and another gas utility is bringing innovation to Minnesota's multifamily building energy efficiency market and as the program develops it will reach more customers and likely push the program mix even more strongly toward MF-Exclusive.

The high proportion of MFE-Low-income programs means that these low-income renters, who are the most burdened by their utility bills, are a much bigger focus in Minnesota than in the other states examined.

Figure 2: Multifamily electric energy efficiency spending in states by program classification and sector, as a percentage of annual total multifamily electric energy efficiency spending

Distribution of Gas Spending Among Multifamily Efficiency Program Categories

As previously mentioned, the very limited natural gas energy efficiency efforts in Indiana and Ohio mean that there is not sufficient program-level data for natural gas in these states to perform any analysis. Iowa and Minnesota, however, require energy efficiency savings from their natural gas utilities and have large investor-owned dual-fuel utilities. This means that program-level natural gas energy efficiency data comparable to the electric-side data is readily available in these states for analysis.

Iowa

In Iowa, as with electricity, there is a wide mixture of programs for multifamily natural gas customers across the state, as shown in Figure 3. MF-Inclusive programs (especially in the low-income segment) dominate, but as with the electric side, there has been strong growth in recent years of MF-Exclusive natural gas programs.

As previously mentioned, two of Iowa's four natural gas IOUs are also electric utilities. The multifamily program offerings from these utilities are dual gas-electric programs. Programs that install both electric and gas measures at the same time simplify program delivery and, especially if combined with a program approach that upgrades both residential and commercial (common area) building spaces, can provide a path to achieving all cost-effective energy savings for a building. The third gas utility is gas-only and does not have programs that pair with electric savings measures. A fourth small gas utility does not currently offer multifamily programs.

Minnesota

In Minnesota, MFI-Commercial programs dominate the natural gas multifamily offerings, but MF-Exclusive program investments have been growing on the natural gas side. This derives in part from cooperation between a dual electric-gas utility and a gas-only utility with a partially overlapping service territory on a new and innovative multifamily building program. The high percentage of MF-Inclusive is a result of a utility that does not have MF-Exclusive programs but does have broad eligibility for multifamily buildings in its general offer commercial sector programs.

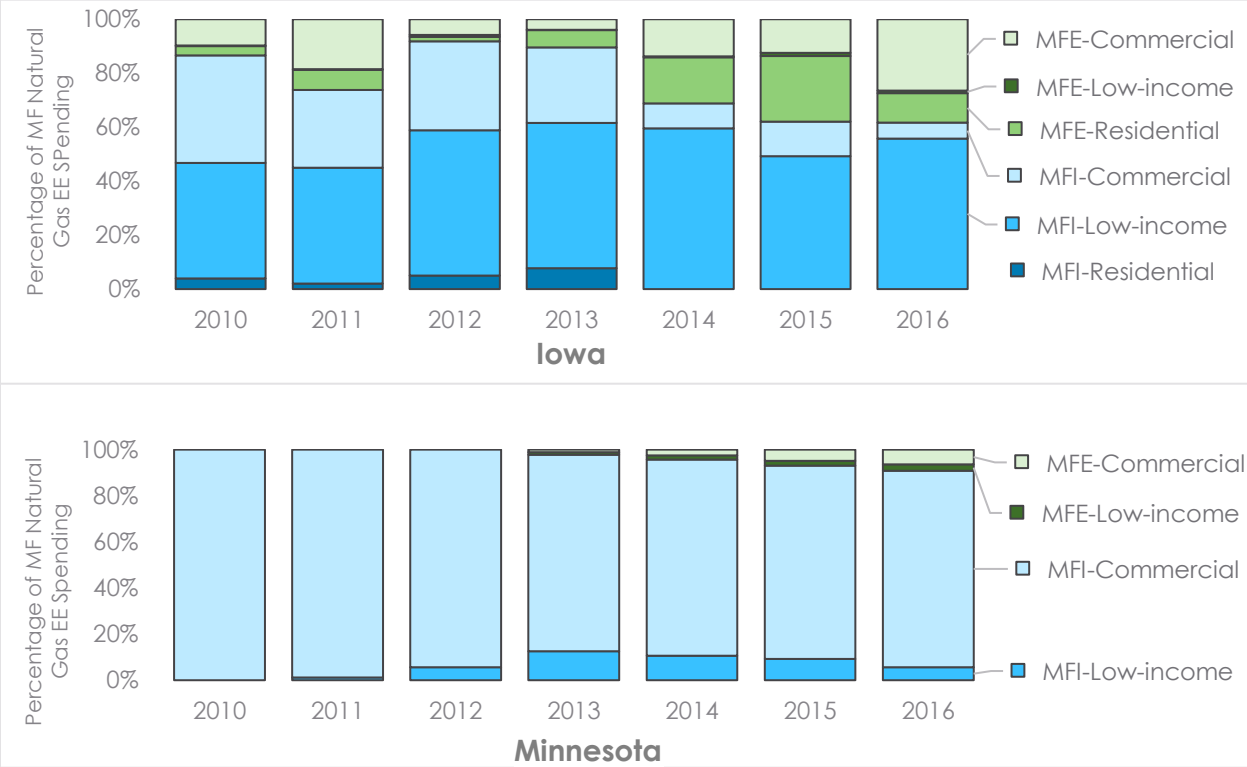

Figure 3: Multifamily natural gas energy efficiency spending in states by program classification and sector, as a percentage of annual total multifamily energy efficiency spending

Multifamily Electric Efficiency Compared with Total Electric Efficiency Spending

Beyond the promising trends in the distribution of funding among multifamily program categories, there remains the question of how multifamily spending compares with total spending on energy efficiency. The state-by-state details below show that MF-Exclusive spending is generally on the rise as a percentage of efficiency portfolios, while MF-Inclusive is on the decline in all the states except Ohio.

Indiana

The overall reduction in energy efficiency funding in Indiana due to policy changes has affected program offerings for all customer segments, though some program areas have seen greater reductions than others have. Funding for Indiana's MF-Exclusive electric programs has remained relatively flat over the past several years (Figure 4). It peaked in 2012 during the early stages of program ramp up for the state's newly adopted efficiency standard at 2.8% of total energy efficiency spending. It is currently about 1.9%.

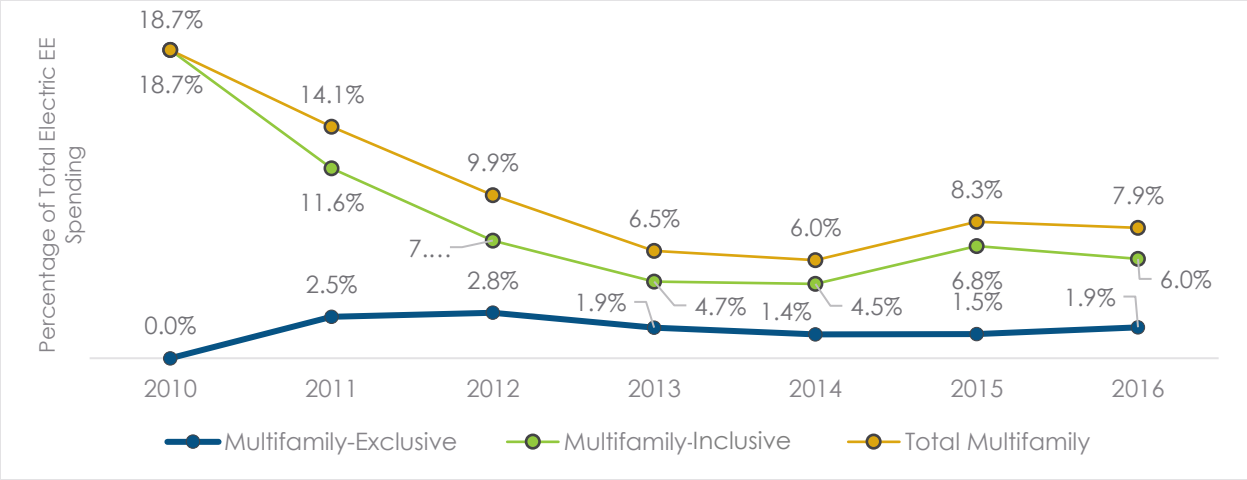

*Figure 4: Multifamily energy efficiency spending in **Indiana** by program classification, as a percentage of annual statewide total energy efficiency spending by electric utilities.*

Ohio

Figure 5 shows the share of Ohio's multifamily programs in overall statewide electric energy efficiency investment. MF-Exclusive programs have not played a role in Ohio's energy efficiency portfolios until recently. Prior to 2015, multifamily spending was solely on MF-Inclusive programs. Some of the MF-Inclusive programs dropped off in the 2015 program year, but with the growth of MF-Exclusive, overall statewide multifamily spending has continued to increase through 2016. MF-Exclusive spending was about 1.7% of total planned energy efficiency spending in Ohio in 2016.

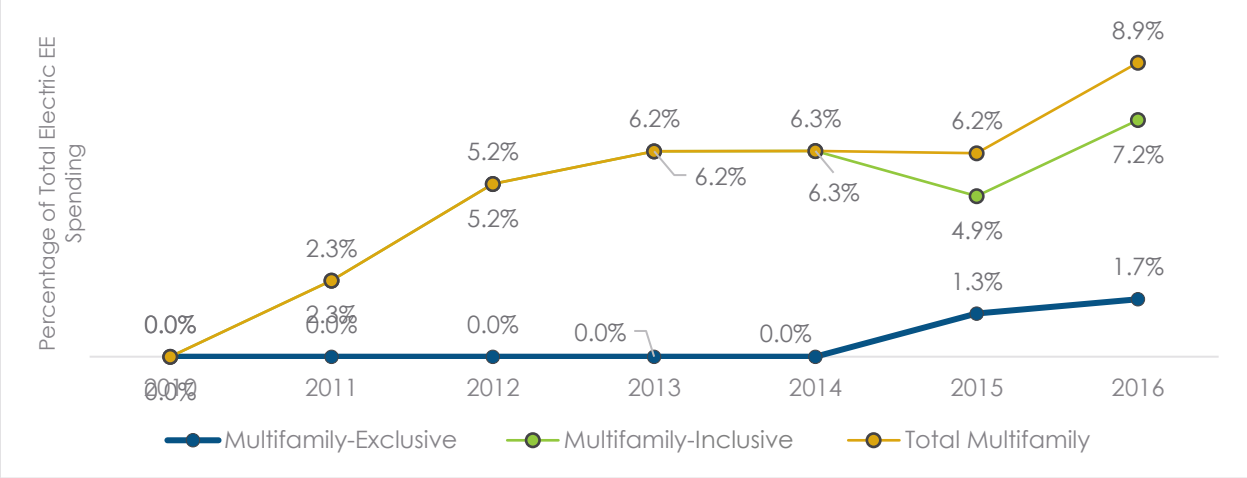

*Figure 5: Multifamily energy efficiency spending in **Ohio** by program classification, as a percentage of annual statewide total energy efficiency spending by electric utilities.*

Iowa

Looking at multifamily as a percentage of total electric energy efficiency spending (Figure 6) Iowa is currently spending over 9% of total energy efficiency budgets on multifamily. Most significantly, in 2016 that spending shifted from mostly MF-Inclusive

programs into MF-Exclusive programs. MF-Exclusive programs already had a role in Iowa's energy efficiency offerings, but 2016 is the first year that focused multifamily programs have exceeded the funding available for the broader, non-exclusive offerings. MF-Exclusive programs are about 6% of total energy efficiency spending by Iowa's electric IOUs in 2016. MF-Exclusive spending as a percentage of total efficiency spending in Iowa is more than three times the spending percentage in Ohio and Indiana.

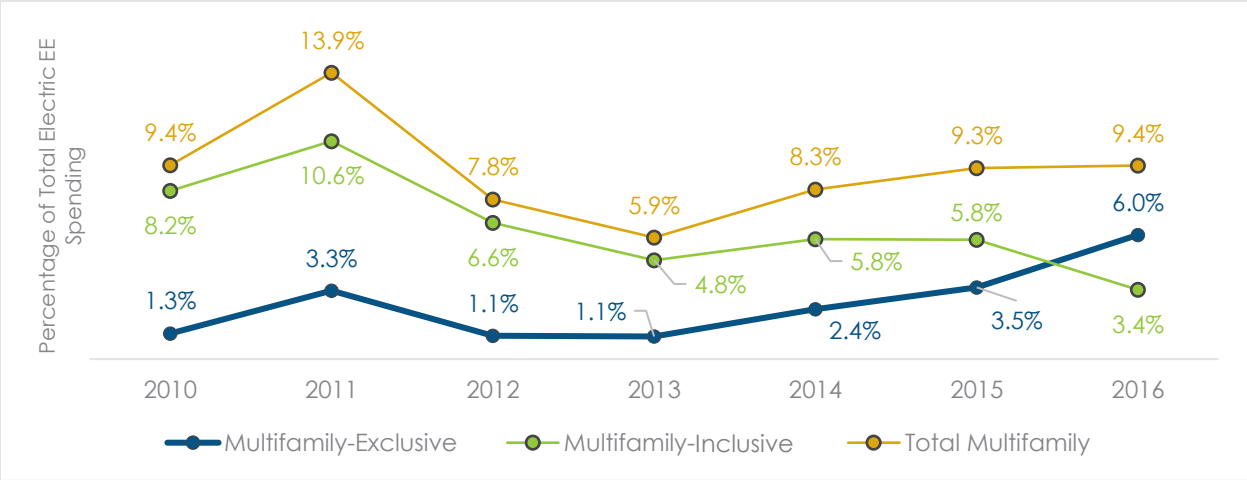

*Figure 6: Multifamily energy efficiency spending in **Iowa** by program classification, as a percentage of annual statewide total electric energy efficiency spending by electric utilities.*

Minnesota

A key element of the strength of multifamily electric energy efficiency in Minnesota is the rise since 2012 of MF-Exclusive programs. Figure 7 shows that, as of 2014, spending on these programs exceeded spending on MF-Inclusive programs and continues to rise. MF-Exclusive programs are an estimated 1.3% of total energy efficiency spending in Minnesota for 2016.

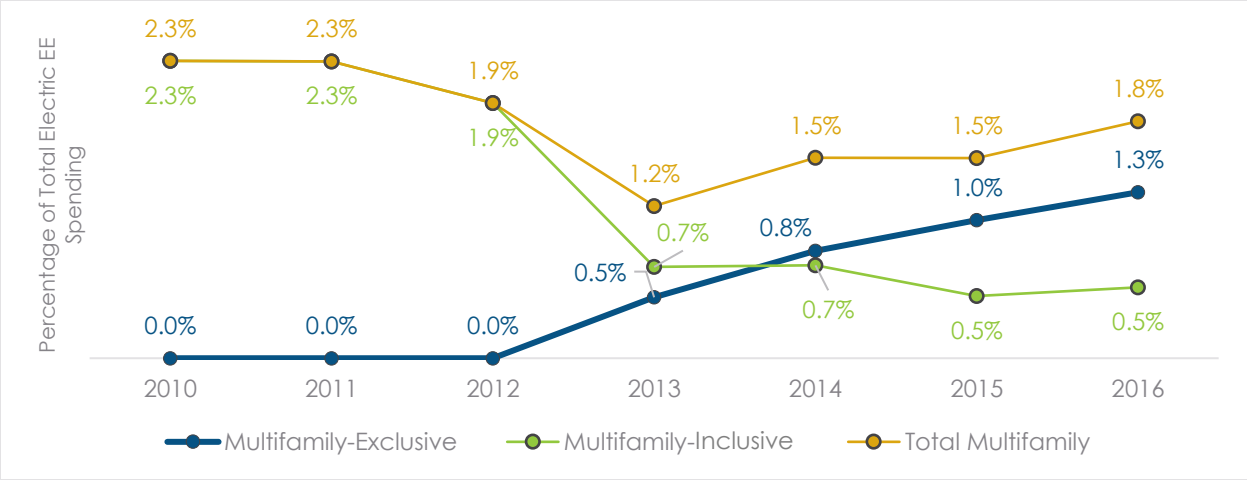

*Figure 7: Multifamily energy efficiency spending in **Minnesota** by program classification, as a percentage of annual statewide total electric energy efficiency spending by electric utilities*

Multifamily Gas Efficiency Compared with Total Gas Efficiency Spending

Multifamily spending is a small percentage of total energy efficiency spending by natural gas utilities, as with electric utilities. As this section shows, MF-Exclusive programs are making gains as a percentage of utility natural gas efficiency portfolios, but not as sharply as seen on the electric side.

Iowa

Similar to what was seen on the electric side, MF-Exclusive natural gas programs are generally increasing as a percentage of total natural gas energy efficiency spending in Iowa, while MF-Inclusive programs are a smaller part of the total. MF-Exclusive spending by natural gas utilities in Iowa is currently about 4.1% of total energy efficiency investment (Figure 8).

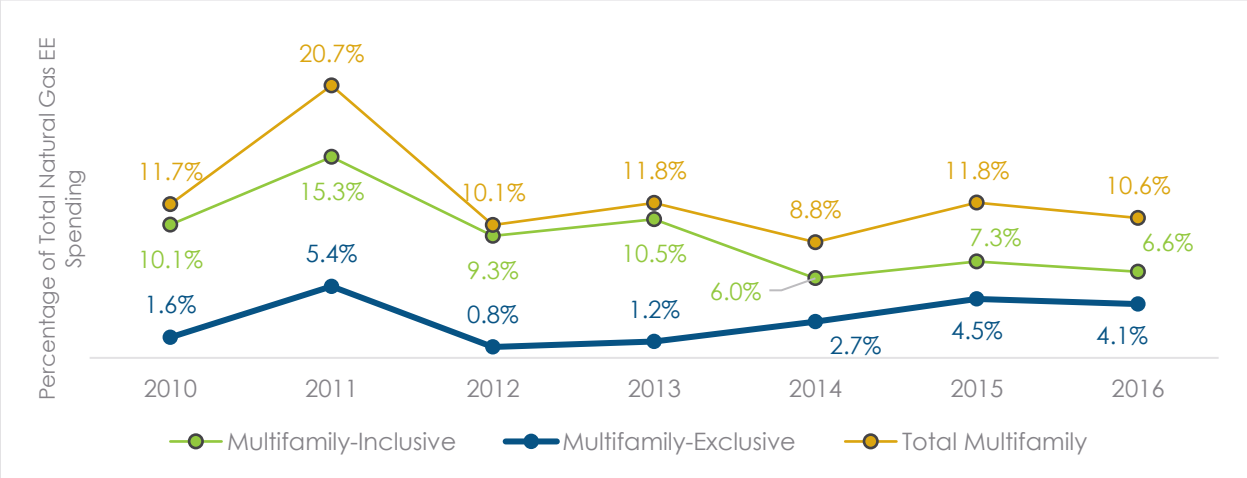

*Figure 8: Multifamily energy efficiency spending in **Iowa** by program classification, as a percentage of annual statewide total electric energy efficiency spending by natural gas utilities.*

Minnesota

As mentioned in the discussion of the distribution of programs in the multifamily space for Minnesota, MFI-Commercial programs dominate the multifamily space in that state. This primarily comes from one utility with large commercial sector programs that does not currently offer any MF-Exclusive programs. Statewide, MF-Exclusive programs are gaining ground, currently about 2.3% of statewide natural gas energy efficiency investment (Figure 9), a percentage point higher than on the electric side.

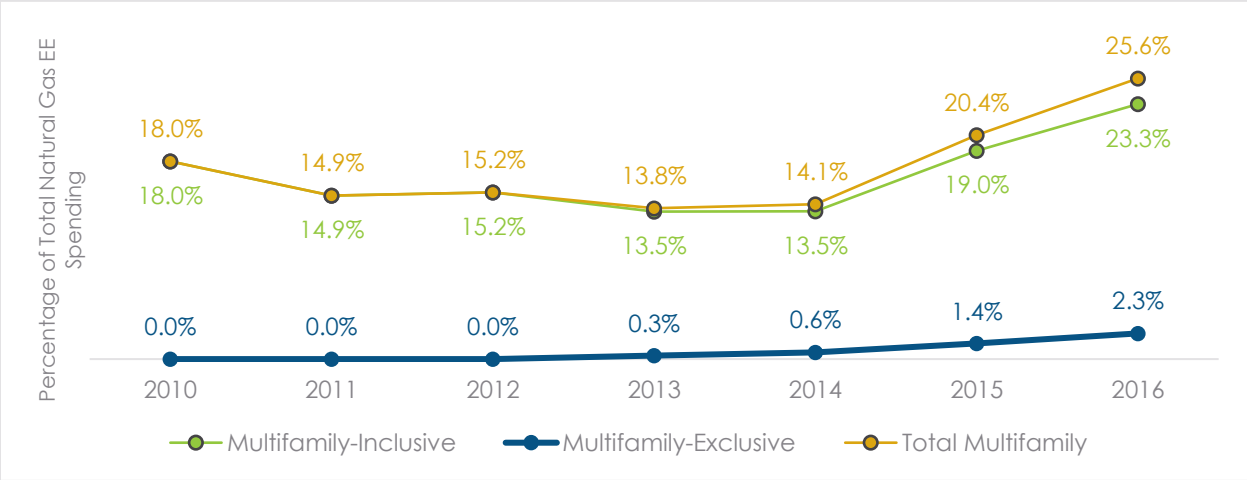

*Figure 9: Multifamily energy efficiency spending in **Minnesota** by program classification, as a percentage of annual statewide total electric energy efficiency spending by natural gas utilities.*

Multifamily Energy Efficiency Savings

While energy efficiency investment drives the programs, energy savings are the ultimate goal. The investments made in Midwest states in multifamily energy efficiency have resulted in energy savings. This section explores how those savings add up for multifamily customers.

Distribution of Electric Savings Among Multifamily Efficiency Program Categories

As with spending, energy savings come from a mixture of program categories. Some program types produce higher levels of savings than others produce. The following section details the mixture savings from the varying program categories in each state.

Indiana

Energy efficiency electricity savings from multifamily programs in Indiana (Figure 10) are generally proportional to the spending previously shown. The majority of multifamily savings in Indiana come from MF-Inclusive programs, shown in shades of blue, but again it is unclear how much of those savings are derived from multifamily versus single-family customers as that data is not available. 2012 was a particularly successful program year for MF-Exclusive residential programs and was the only year that these programs provided more than 50% of Total MF savings. That was the first year of the

implementation of the state's energy efficiency resource standard and there was a limited mix of early adoption programs.

Ohio

As seen with Ohio's multifamily electric energy efficiency spending, savings from multifamily programs in Ohio have mostly come from MF-Inclusive programs—MFI-Residential exclusively in 2011 with MFI-Low-income programs added in subsequent years. Reduced spending on MFI-Residential programs and the adoption of a new MFE-XSector program by one utility in 2015-2016 led to near-parity in the proportion of MF-Inclusive to MF-Exclusive program savings statewide in Ohio in 2016 (Figure 10).

As a percentage of total energy efficiency savings, Total MF has fluctuated in Ohio as programs have changed and had varying degrees of success over the years. It is normal to see more variability in achieved savings than is seen in budgets, as cost of achieved savings can vary from program year to program year.

Iowa

Savings from multifamily electric programs in Iowa show a similar pattern to spending, but skew more heavily toward the savings from MFI-Commercial (Figure 10). Commercial sector savings are generally highly cost-effective and this is not surprising. The increased spending seen in MFE-Residential and MFE-Commercial are not necessarily translating to the same level of increase in savings, which demonstrates the difficulty of reaching deep energy savings in the hard-to-reach multifamily market and the benefit of a coordinated whole-building approach to program delivery.

Minnesota

Though low-income programs have traditionally been a large component of Minnesota's electric multifamily spending, they are not typically a high-performing class of programs. As utilities have added new multifamily offerings in Minnesota, the proportion of savings coming from MF-Inclusive programs has decreased (Figure 10). MFE-Low-income programs have performed better in the multifamily space than MFI-Low-income since they focus better on reaching energy savings in multifamily buildings, but the largest percentage of multifamily electric savings for 2016 comes from MFE-Commercial energy efficiency.

Figure 10: Multifamily electric energy efficiency savings in states by program classification and sector, as a percentage of annual total multifamily energy efficiency savings

Distribution of Gas Savings Among Multifamily Efficiency Program Categories

Iowa

As seen previously with natural gas energy efficiency spending in Iowa, the energy efficiency savings have shifted from being predominantly MF-Inclusive programs, primarily commercial sector programs, toward a greater percentage of MF-Exclusive programs, Figure 11. Savings from the commercial sector, both MF-Inclusive and MF-Exclusive, provide the majority of the natural gas savings.

Minnesota

Minnesota's multifamily natural gas savings are primarily from MFI-Commercial programs. There is one utility with large commercial sector programs that are MF-Inclusive, though in the later discussion of multifamily program participation, we note that multifamily customers are only a small percentage of those programs' participants. Newly adopted MF-Exclusive programs that are still ramping up should boost MF-Exclusive as part of the program mix in upcoming program years, especially as actual performance data (as opposed to planned savings) become available and programs are evaluated and modified.

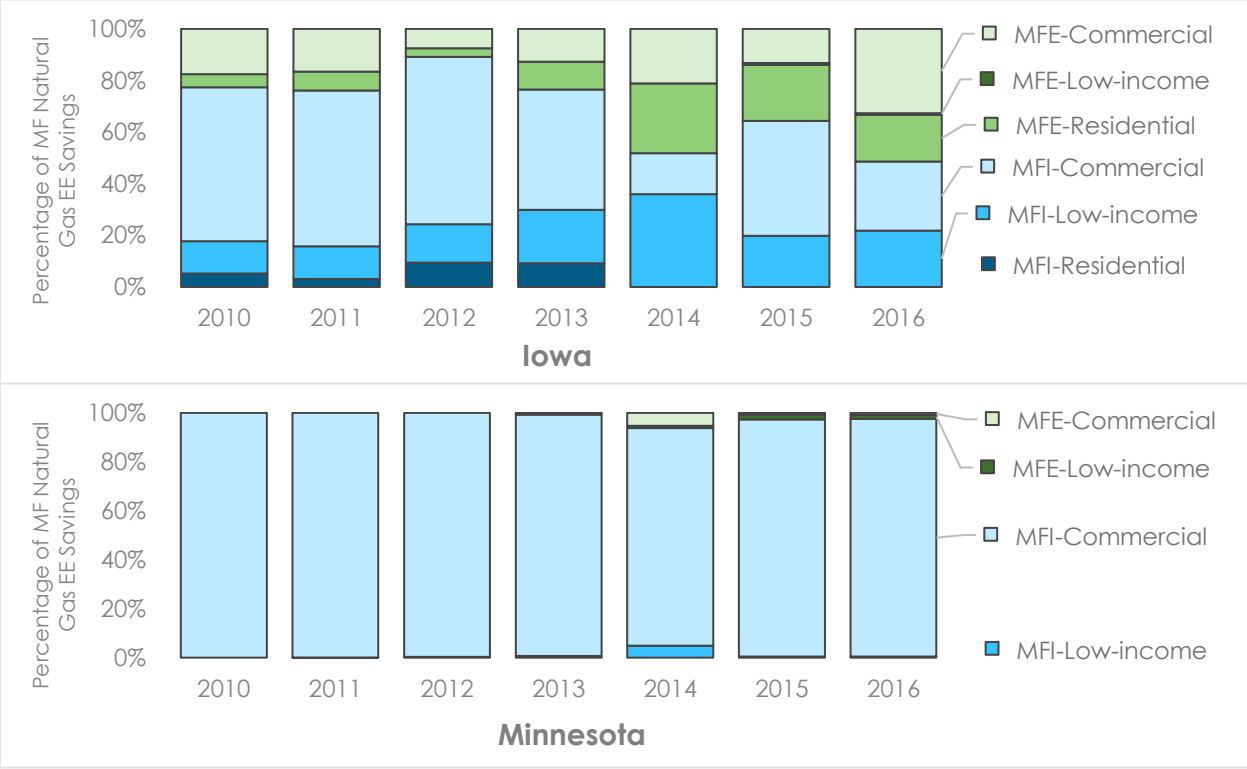

Figure 11: Multifamily natural gas energy efficiency savings in states by program classification and sector, as a percentage of annual total multifamily energy efficiency savings

Multifamily Electric Efficiency Compared with Total Electric Efficiency Spending

As previously shown, spending on multifamily energy efficiency was not a large percentage of total energy efficiency spending, ranging from 1.3-6.0% of total efficiency spending. As this section shows, multifamily energy efficiency savings are an even smaller component of energy efficiency savings, though as with spending there is a trend toward increasing savings from MF-Exclusive programs.

Indiana

As was seen with the spending, early adoption of MF-Inclusive programs meant that they were a high percentage of overall electric portfolio savings as Indiana's EERS ramped up, but as new non-multifamily programs came online the percentage from multifamily dropped off. Multifamily offerings have flattened out to only a low percent of overall program savings but have had a slight increase in percentage as other programs have seen greater reductions in response to the repeal of the EERS.

With the exception of the early ramp-up years when there was low program diversity, MF-Exclusive programs have not been a large component of the total energy efficiency savings in Indiana, as shown in Figure 12. Savings from MF-Exclusive programs are about 1.2% of expected energy efficiency savings for 2016.

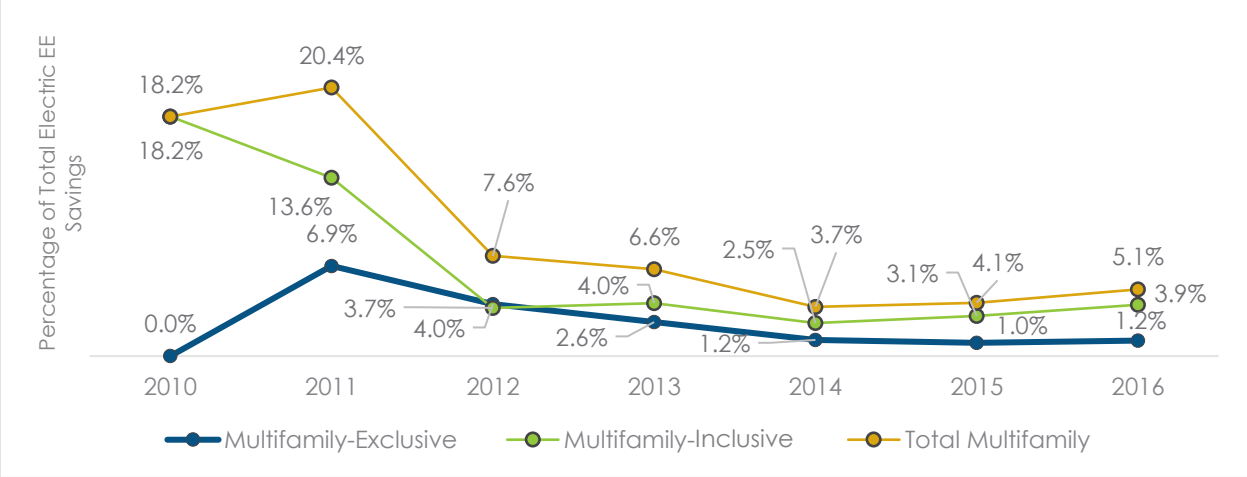

*Figure 12: Multifamily energy efficiency savings in **Indiana** by program classification, as a percent of total energy efficiency savings by electric utilities.*

Ohio

MF-Exclusive programs have not historically been part of the utility electric energy efficiency portfolios in Ohio. A new program offered since 2015 has increased that from zero to about 0.6% of total electric energy efficiency savings in the state (Figure 13). Because it is a new program, it is likely that savings will continue to grow over the next program cycle as the program develops and matures and the program administrator and implementer make modifications in response to program evaluation. The MFE-XSector program is an important addition in Ohio because it reaches further than in-unit

residential measures and has the potential to impact areas such as building envelope and mechanical systems that strictly residential multifamily programs are unable to reach.

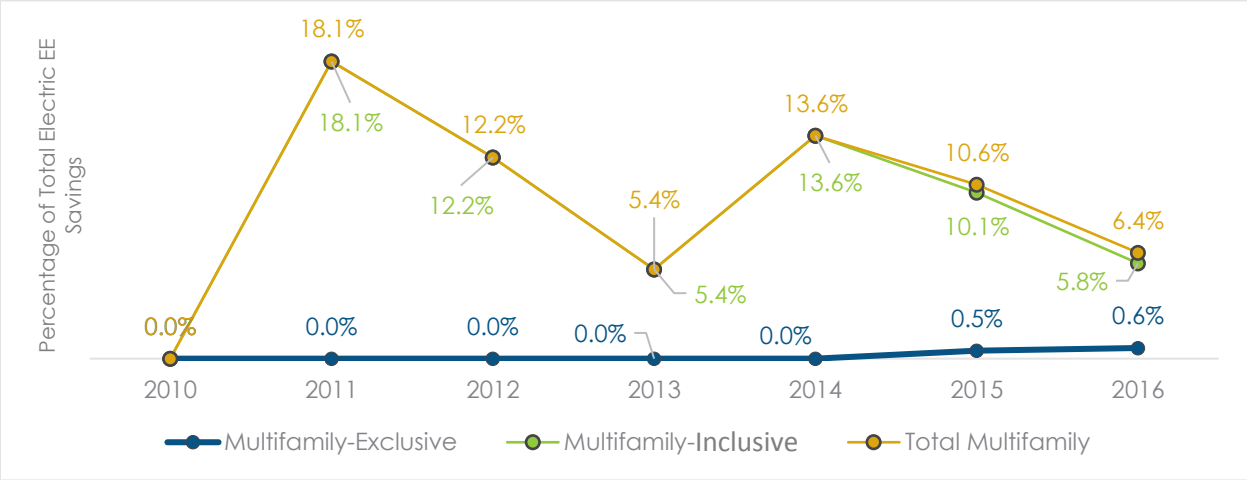

*Figure 13: Multifamily energy efficiency savings in **Ohio** by program classification, as a percent of total energy efficiency savings by electric utilities.*

Iowa

As discussed above, the increase in spending has increased MF-Exclusive electricity savings, but the difficulty of reaching multifamily buildings with energy efficiency means that savings have not increased at the same rate as spending. The trend is there, as shown in Figure 14, and it is likely that MF-Exclusive savings will exceed MF-Inclusive savings in the next program cycle. In 2016, about 2.9% of total electric energy efficiency savings in Iowa will come from MF-Exclusive programs.

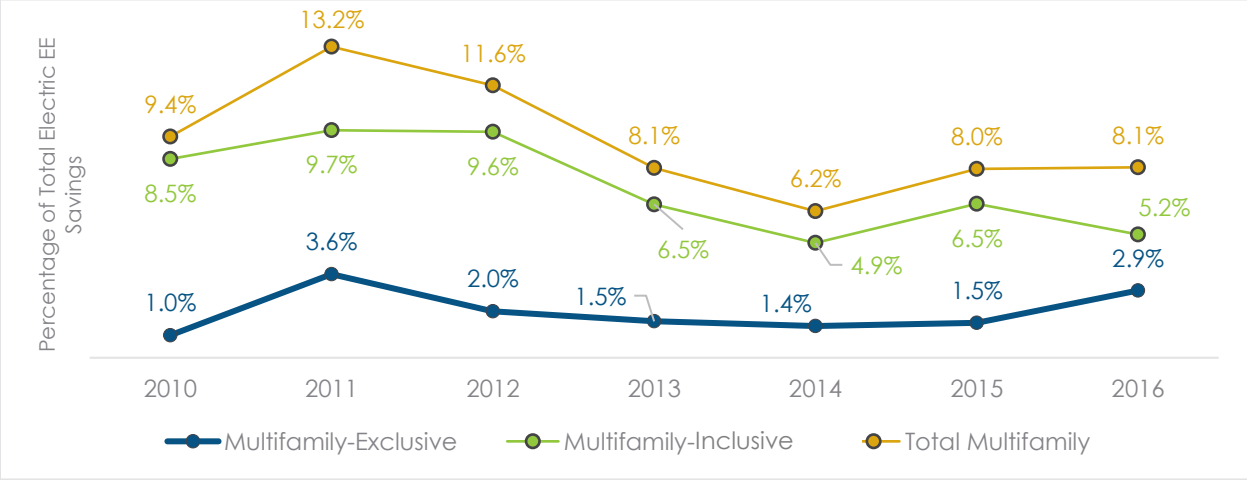

*Figure 14: Multifamily energy efficiency savings in **Iowa** by program classification, as a percent of total energy efficiency savings by electric utilities*

Minnesota

Savings from multifamily electric efficiency programs in Minnesota total about 0.6% of total statewide energy efficiency savings (Figure 15). Because of the large amount of multifamily programs serving low-income customers, multifamily savings as a percent of total savings are lower than those on the spending side, but the adoption of additional non-Low-income multifamily programs and MF-Exclusive programs has diversified the offerings and increased multifamily as a percent of overall savings.

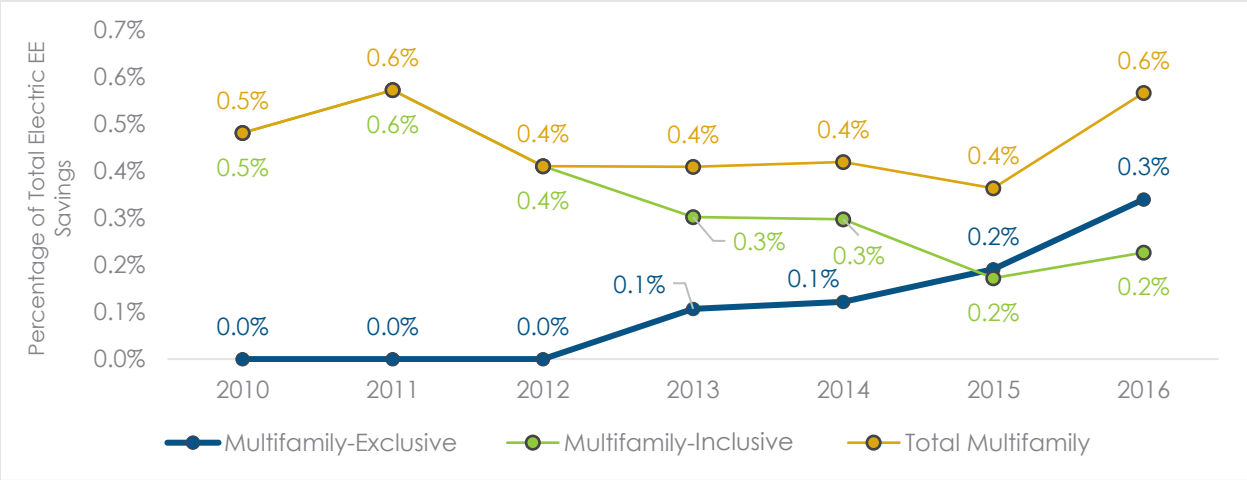

*Figure 15: Multifamily energy efficiency savings in **Minnesota** by program classification, as a percent of total energy efficiency savings by electric utilities*

Multifamily Gas Efficiency Compared with Total Gas Efficiency Spending

Iowa

In Iowa, MF-Exclusive program natural gas savings have been rising gradually as a percentage of total natural gas savings (Figure 16). In 2016, MF-Exclusive natural gas programs accounted for 3.6% of statewide natural gas programs. The dual gas-electric nature of some of these programs should help provide greater reach and greater savings in subsequent program years.

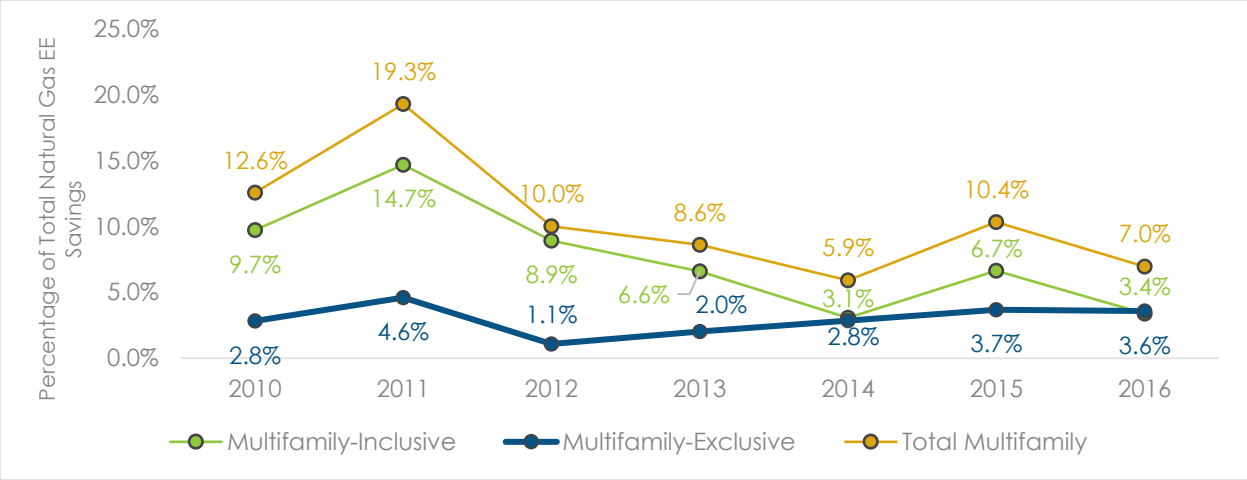

*Figure 16: Multifamily energy efficiency savings in **Iowa** by program classification, as a percent of total energy efficiency savings by natural gas utilities*

Minnesota

MFI-Commercial programs dominate Minnesota's multifamily natural gas savings the same as they did with spending. However, MF-Exclusive program savings are slowly rising (Figure 17), reaching about 1.4% of total natural gas savings for 2016. The cooperative gas-electric multifamily energy efficiency programs in Minnesota should help promote expanded reach into multifamily buildings and achieve greater savings for both energy sources.

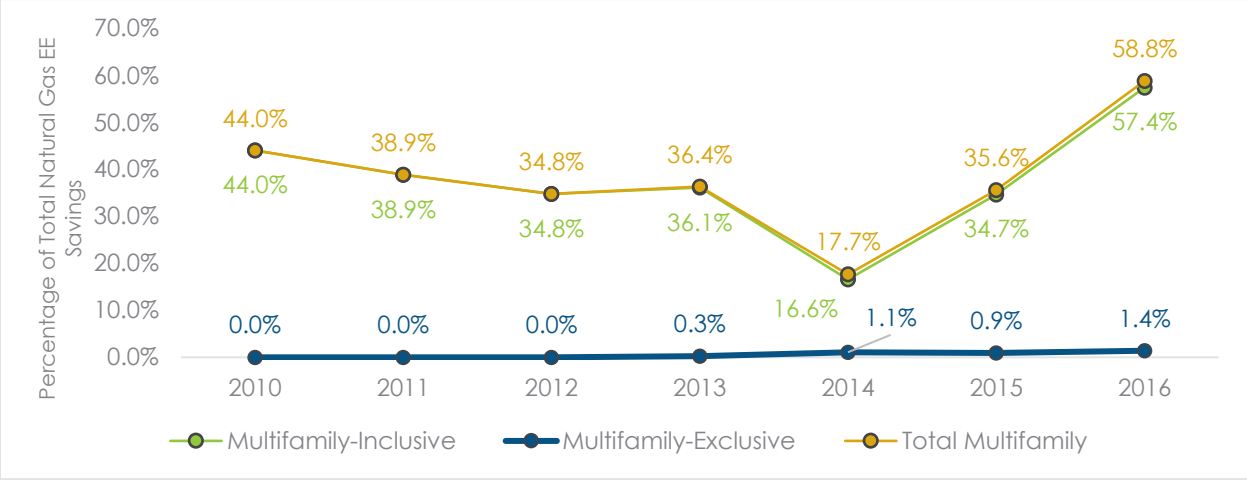

*Figure 17: Multifamily energy efficiency savings in **Minnesota** by program classification, as a percent of total energy efficiency savings by natural gas utilities*

Discussion

MF-Exclusive programs are a low proportion of the total programs that have the potential to reach the multifamily housing sector. MF-Exclusive programs, however, are starting to claim a larger share of the multifamily energy efficiency market. This is important for three reasons:

1) All of the program spending and savings benefit multifamily customers, a historically underserved market;
2) MF-Exclusive programs, especially those that deliver commercial measures, can be designed to include retrofits to achieve deep energy savings; and
3) Integrated delivery of residential and commercial programs streamlines energy improvements and makes efficiency programs much more accessible for building owners.

Multifamily Program Participation

Unfortunately, there is a lack of good data on the participation levels for single-family versus multifamily for MF-Inclusive programs. Most utility reports for do not provide a detailed breakdown of participation by the different housing/building types. Discussion with multifamily program managers at several utilities suggested that participation rates by multifamily customers in MFI programs is generally low.

One natural gas utility in Minnesota reported useful data for quantifying MF-Inclusive participation rates. Participation numbers were explicitly broken out for rental (multifamily) buildings. On average, over six years, 8.5% of MFI-Commercial program participation for that single utility came from multifamily customers. A program manager from another Minnesota utility was able to provide data for another MFI-Commercial program that put multifamily participation at 9-12% of program participants over three program years. Both of these cases are commercial sector programs, and while there is anecdotal understanding that there is multifamily participation in MFI-Residential and MFI-Low-income programs, there are no data available to quantify that participation level. For both of these MFI-Commercial programs, the majority of the resources and benefits do not reach the owners and residents of multifamily housing.

Although by definition MF-Exclusive programs have all annual participants coming from the multifamily customer segment, it is also useful to look at how that compares with the total eligible customer base. In a 2013 review of nine ongoing MF-Exclusive energy efficiency programs from around the country, ACEEE found annual participation rates in multifamily energy efficiency programs ranging from 0.5% to 16% of eligible customers participating in the program, with an average of 2.6%. Whole-building retrofit programs that offered the deepest savings were around 1% annual participation, whereas

install/rebate programs with shallower savings achieved much higher participation rates, around 10-15%. [xiv]

The need for better data on multifamily program participation is of paramount importance for program administrators to understand how well they are reaching their multifamily customers and for energy efficiency and housing advocates that work to increase the penetration of efficiency measures into the multifamily building market. Quantification of multifamily participation in MF-Inclusive programs wherever possible, especially on the residential side where no data currently exists, would provide a useful understanding of how well these programs are (or are not) reaching multifamily customers and could provide a convincing argument for program administrators that are seeking approval for new or expanded MF-Exclusive programs from their regulators. A deeper discussion of data quality is beyond the scope of this paper, but the Electricity Markets & Policy Group at Lawrence Berkeley Lab has provided a data schema and reporting tool that program administrators could use to improve and standardize their reporting and performance metrics.[xv]

Future Analysis

Some of the conclusions about trends in program offerings will require data from future program years to prove out. Additionally, future analysis could include the remaining states with EERS in the Midwest (Illinois, Michigan and Wisconsin).

As previously shown, MF-Exclusive programs account for 1-6% of total electric energy efficiency spending and 2-4% of total natural gas energy efficiency spending in the four Midwest states examined. These numbers have generally been increasing since 2010. However, customers living in multifamily housing represent 13-17% of the total housing market in those states. Advocates, utilities and policymakers can work together to address this apparent discrepancy and to determine the proper metrics to use to evaluate forward progress in reaching multifamily customers with energy savings.

Comparing the proportion of ratepayer dollars supporting multifamily programs to the proportion of multifamily buildings in a state is one possible metric for discerning issues of equity and access, but it is not necessarily the best one. To understand these issues policymakers, utilities, implementers, advocates and other stakeholders should determine 1) what common metrics can be measured and reported to quantify the reach into the multifamily housing market and 2) how program design and delivery can address these issues.

Recommendations

To serve the multifamily housing market more effectively, policymakers, utilities, advocates and other industry stakeholders need to understand the history, evolution and status of multifamily programs. Various policies drive energy efficiency in the four states examined in this paper. Additionally Iowa and Minnesota have had multifamily programs on the books longer than Indiana and Ohio. These characteristics can affect the number and diversity of energy efficiency programs offered and the ability of programs to reach their intended customers.

The following recommendations could help program administrators, advocates and policymakers to improve delivery and accessibility of energy efficiency to multifamily buildings:

1. Examine the multifamily housing market in their territories. This paper looks at statewide trends, but recognizing the differences within individual utility territories, such as higher proportions of multifamily customers in cities than in rural areas, will help utilities to tailor their program design and implementation to increase their reach into the multifamily market.
2. Track the participation of, spending on, and savings achieved by multifamily customers within MF-Inclusive programs if possible, or consider program design/tracking changes that would make this possible. This would shed light on how well these broad programs are actually reaching multifamily customers.
3. Track the ways in which a multifamily customer participates in residential and commercial programs to understand how savings are achieved and whether there are opportunities to attain additional savings. For example, direct installation of a few lightbulbs may count as a multifamily participant, but such 'light touch' programs may be leaving substantial cost-effective energy efficiency savings on the table. Multifamily energy efficiency needs a balance between programs that reach many customers and programs that provide deeper savings where the need is greatest.
4. Expand the availability of MF-Exclusive programs, especially programs that offer whole-building, deep energy savings. This can be taken a step further with the delivery of one-stop shop programs (combining whole-building, in-unit, common area, and building envelope gas and electric measures). These programs designs can make participation easier for building owners with a single program to navigate rather than multiple stand-alone programs with multiple points-of-contact.
5. Evaluate how changes in energy efficiency policy will affect program operations, particularly for programs that disproportionately assist low-income and vulnerable communities.

6. Assess issues of equity among customers surrounding access and implementation of energy efficiency programs. Metrics that measure equity could be incorporated into program design and evaluation.

Conclusion

Traditionally, much of the Midwest's energy efficiency programming that includes multifamily buildings has come in the form of low-income programs and residential direct install and prescriptive programs available to both multifamily customers as well as single-family residents. Though multifamily housing accounts for an average of 15% of the region's housing stock, planned MF-Exclusive energy efficiency spending in 2016 was only 1.3-6.0 percent of total electric energy efficiency spending planned in the states examined and 2.3-4.1 percent of natural gas spending. Similarly, 0.3-2.9 percent of the total electric energy efficiency savings and 1.4-3.6 percent of planned natural gas savings for 2016 come from MF-Exclusive programs. The rise of MF-Exclusive programs in the region is bringing new opportunities to reach deeper for the energy savings and engage more participants.

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Appendix A: Definition of Low-income

The definition of "low-income" varies from utility to utility. Factors that influence the definition could include statewide definitions from low-income energy efficiency requirements, the characteristics of a utility's service territory or the design of the program to reach narrower or broader groups of customers. The table below summarizes the definitions of low-income and multifamily building qualifications found in the multifamily low-income programs reviewed. This paper does not have any specific definition of low-income, considering any program as low-income if the utility specifies it as such.

State	Utility	Fuel	MF Program Name	Cate-gory	Year	Definition Low Income	Definition Multifamily
IA	Black Hills	Gas	Low-income Multifamily Efficiency Improvement Initiative	MFE	2010-2013	No specific definition given	No specific definition given
IA	Black Hills	Gas	Low-income Multifamily Efficiency Improvement Initiative	MFE	2014-2016	No specific definition given	No specific definition given
MN	Center-Point	Gas	Low Income Multifamily Buildings	MFE	2013-2016	Building operated by recognized and authorized Low-income housing provider	5+ units
OH	DP&L	Electric	Residential Low Income Affordability	MFI	2013-2016	200% of federal poverty level, or qualified for energy assistance programs (HWAP, PIPP, HEAP)	No specific definition given
IN	Duke	Electric	Agency Assistance Portal (aka Agency Kit & CFLs)	MFI	2012-2016	Meet financial requirements of the Low Income agency where they are applying for assistance	No specific definition given
OH	Duke	Electric	Low Income Neighborhood	MFI	2012-2016	At least 50% of homes in neighborhood must be at or below 200% of federal poverty level	No specific definition given
MN	Great-Plains	Gas	Low-income Affordable Housing	MFI	2010-2012	No specific definition given	No specific definition given
IN	I&M	Electric	Income Qualified Weatherization	MFI	2010-2014	200% of federal poverty level	No specific definition given
IA	IPL	Electric, Gas	Multifamily and Institutional Efficiency Improvements	MFE	2010-2016	No specific definition given	Section 8 and institutional housing

MN	MERC	Gas	4U2 Project	MFI	2011-2016	201-300% of federal poverty level ("just above the income guidelines for LIHEAP and low income weatherization")	Multifamily up to 4 units
IA	Mid-American	Electric, Gas	Low Income Residential, Low Income Nonresidential	MFI	2010-2016	LIHEAP-qualified	Section 8 or Low-income Tax Credit Property
MN	Minnesota Power	Electric	Comprehensive Low-income Energy Partners	MFI	2011-2013	"The program will not be limited to people who currently participate in fuel assistance or weatherization, but rather, will encourage participation from individuals who may not traditionally participate in the Low-income eligible programs (i.e., working poor and people who are not aware of these programs or prefer not to participate for personal reasons)."	No specific definition given
MN	Otter Tail	Electric	House Therapy	MFI	2010-2016	No specific definition given	No specific definition given
MN	Xcel	Electric	Low Income Home Electric Energy Savings	MFI	2010-2012	50% of state median income or 200% of federal poverty level, whichever is greater	No specific definition given
MN	Xcel	Electric, Gas	Multi-Family Energy Savings Program	MFE	2013-2016	50% of households have income below 50% of state median income or 200% of state poverty level (2-4 units); 66% of units (5+ units) (as defined by the State of MN)	No specific definition given

Appendix B: Docket List

This is a list of utility regulatory commission dockets used as sources for data for this project. Other non-docket sources, such as commission reports were also used. This is not a comprehensive list of all energy efficiency dockets in these states.

Data for 2010-2014 are from reported actual spending and savings, while 2015-2016 represent planned values for which full reporting of actual results was not available at the time of data compilation.

Iowa

EEP-2012-0001

EEP-2012-0002

EEP-2013-0001

Indiana

42693-S1

43827-DSM 5

43955-DSM3

44486

44497

44645

Minnesota

08-640.02

09-198.04

09-198.05

09-198.06

09-644

10-356.01

10-356.02

10-356.03

10-526.01

10-526.02

10-526.03

12-477

12-477.06

12-477.07

12-477.08

12-564

13-277

13-277.01

13-277.02

13-409.01

13-409.02

Ohio

11-1311-EL-EEC

11-4393-EL-RDR

12-1477-EL-EEC

12-1857-EL-RDR

13-0431-EL-POR

13-1129-EL-EEC

13-1182-EL-EEC

14-0456-EL-EEC

14-0853-EL-EEC

15-0919-EL-EEC

15-0454-EL-EEC