MEMORANDUM

TO: City Council Members

CC: Elaine Hart, Interim City Manager
Robert D. Goode, Assistant City Manager

FROM: Jackie A. Sargent, General Manager

DATE: January 20, 2017

SUBJECT: Austin Energy Assessment of Energy Efficiency Programs – Resolution 20160811-033

Attached is a detailed assessment of the feasibility and cost effectiveness of new or expanded energy efficiency programs targeting the rental population in Austin Energy's service territory. This report is prepared in response to City Council Resolution 20160811-033. The report provides insights on commercial and residential rental segments, the reach of existing programs and new programs that are under development and/or study. An electronic version of the report can be located on Austin Energy's website in the Corporate Reports and Data Library, Customer Energy Solutions Program Updates: http://austinenergy.com/wps/portal/ae/about/reports-and-data-library/customer-energy-solutions-program-updates.

Assessment of Feasibility and Cost-Effectiveness of New and Expanded Energy Efficiency Programs in Response to Council Resolution 20160811-033

January 20, 2017

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Executive Summary

In August of 2016, City Council passed Resolution 20160811-033 (hereinafter referred to as the Resolution – see Appendix 6.1) directing the City Manager and Austin Energy to assess the feasibility and cost effectiveness of new and expanded programs designed to reach low-participation customer segments, and specifically, rental properties. This document is submitted in response to the Resolution. Research findings indicate the existing utility programs reach the rental market and are being augmented by current and prospective proof of concept programs designed to expand the reach into the commercial, multifamily and residential segments which are dominated by rental stock in the Austin market.

Austin Energy considers a number of community goals when developing or changing programs aimed at reducing the amount of energy used by customers, and the amount of generation required in the marketplace to meet that demand. Some of these goals include: carbon reduction, cost reduction, local solar, more efficient new construction, as well as goals around affordability and equity. To help ensure Austin Energy is adequately addressing these diverse goals, all Distributed Energy Resource (DER) programs are subject to ongoing analysis for cost effectiveness, market reach and impact. Austin Energy weighs all of these criteria when prioritizing programs. DER includes demand side management (DSM) programs that are the primary focus of this report and solar programs.

The Resolution requires an assessment of customer utility programs and measures for market segments labeled as "low participation." Specifically referenced are rebate offerings for improvements to building shells; air ducts and HVAC repairs or retrofits for rental residential facilities of four or fewer dwelling units; HVAC repair or replacement for rental multifamily facilities of five or more dwelling units; and energy efficiency repairs or retrofits for commercial rental spaces.

Existing Programs

Many of the items specified in the Resolution are accommodated within Austin Energy's current program portfolio. The utility provides rebates for energy efficiency improvements to the building shell and heating, ventilation and air conditioning (HVAC) to property owners and renters, including the following:

- Single family and multifamily residences of four or fewer dwelling units are eligible for solar, solar shading, air infiltration sealing, radiant barrier, attic insulation, cool roofs, air conditioners (includes conventional or inverter system, ground source heat pumps) and ductwork diagnostics and replacement. The low income weatherization program also replaces windows and doors.
- Multifamily of five or more dwelling units are eligible for solar, solar shading, window replacements, ceiling insulation, cool roofs, air conditioners and ductwork diagnostics, repairs and replacement as well as custom technology rebates.
- Commercial properties are eligible for thermal energy storage, solar, solar shading, window treatments and replacements, ceiling and roof insulation, reflective roof coating, air conditioners (direct expansion, energy recovery ventilators, chillers, cooling towers) and ductwork diagnostics, repairs and replacement as well as custom technology rebates.

DSM program reach has been high, with over 370,000 residential and commercial energy efficiency rebates and benefits provided since 2007. Renters constitute a significant portion of recipients of these incentives and programs. While specific data is not available for all programs, Home Performance with Energy Star and the Appliance Efficiency programs had rental participation of approximately 21 percent. Austin Energy also has robust program offerings for the multifamily market. According to the National Multifamily Housing Council, 37% of total occupied housing units in Austin are apartments, so program outreach to this segment is critical to addressing renter needs. In 2013, the American Council for an Energy Efficient Economy (ACEEE) released a review of leading multifamily programs and identified 10

best practices among these programs for multifamily programs; however, Austin Energy integrates these best practices in all applicable customer sectors.

ACEEE Recommended Best Practices Utilized In Austin Energy Programs by Customer Segment

Best Practices Recommended	Single Family	Multi-Family	Commercial
Provide a one-stop shop for energy efficiency program services	✓	✓	✓
Incorporate on-bill repayment/**low-cost financing**	✓ Financing [1]	Support PACE	Support PACE
Integrate direct installation & rebates	✓ Both	✓ Rebates	✓ Rebates
Streamline rebates and incentivize in-unit measures to overcome split incentives	✓	✓	✓
Coordinate programs across electric, natural gas, and water utilities	Partnerships with Texas Gas & Austin Water	Partnerships with Texas Gas & Austin Water	Partnerships with Texas Gas & Austin Water
Provide escalating incentives for achieving greater savings levels	✓	✓	✓
Serve low-income households	✓	✓	n/a
Align utility and housing finance programs [2]	✓	✓	n/a
Partner with the local housing industry	✓	✓	✓
Offer multiple pathways for participation to reach more buildings[3]	✓	✓	✓

Source - American Council for an Energy-Efficient Economy

Renters occupy over 99 percent of taxable commercial properties in Austin. Commercial program participation significantly favors renters. Austin Energy is developing metrics to track participation for the rental market for future reports.

All new construction, whether renter or owner occupied, is subject to new building codes for energy efficiency, meaning renter reach is 100% in that segment. Austin Energy has been very active in establishing some of the most aggressive energy codes in the United States. Rental/commercial lease participation in the Green Building program has been strong with participation in commercial segments ranging from 60 to 90 percent for leased buildings. In the multifamily space, participation by renters has been very high with 85 percent of all program participants in the market segment being rental properties.

New Programs in Development/Review

Austin Energy is developing a Community Solar program with a focus on expanding access to renters. The Solar program is also looking at a fractional metering pilot to make it easier for multifamily properties to install solar, and for renters to receive solar credits on their bills. These are two of many new enhancements and programs being developed to serve Austin Energy's rental customers. For example, in 2013 the utility provided residential customers a free web app with daily consumption and alerts to notify the customer when their usage level changes. A companion alert for the commercial market was released in 2016; all areas of the app continue to be enhanced. The Green Building program is developing a web app allowing prospective renters to examine projected electricity costs (based upon

[1] Loan program with Velocity Credit Union for Home Performance with Energy Star Program. On bill repayment could be done for homeowners (not renters) but would require lien

[2] Also partner with Family Eldercare, Austin Fire Department, Neighborhood Housing, Housing Repair Coalition and Housing Authority of Central Austin (HACA) for single and multi-family program delivery and/or financing

[3] Includes point of sale discounts at over 70 retail locations, outreach at 200-250 events annually, consolidated organization, website functionality.

historic consumption from similar units) for living in a particular floorplan of any given apartment in the city to better manage their energy costs.

Energy Efficiency Services has several new programs/enhancements under development targeting renters. Remote and onsite energy audits further assist customers in identifying ways to reduce their usage. The air conditioning (AC) tune up program will provide comprehensive maintenance for an air conditioning unit or heat pump for customers qualifying for weatherization assistance. Both of these efforts are being expanded in FY17.

Austin Energy continues to review the industry trends in programs and technology that are beneficial to our customers. One example is the evaluation of mini split/heat pump units in multifamily units which examines the impact of the higher efficiency equipment.

Managing programs for market reach, cost effectiveness and impact is an ongoing challenge, but current progress to those goals is going well, with program participation among renters strong. Although not directly analogous to residential renter reach, the ability to address low income residents' energy costs does help speak to the overall effectiveness of energy efficiency programs (many low income customers rent, versus own their home). ACEEE did a comparison of low income energy burdens across 50 different metropolitan regions and Austin residents had the 10^{th} lowest energy burden for low income residents. While Austin Energy has excellent reach into rental market segments and employs most of the recommended best practices, development of new tracking metrics, programs and analysis to address those segments will continue to be a priority.

Introduction

For this report, market segments are delineated by Commercial and Residential. Residential customers are segmented by single and multifamily. Programs/technologies for each segment are addressed sequentially in each section of the report for the Energy Efficiency Services, Solar and Green Building groups respectively.

The analysis of data relied on the following sources:

- American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc. (ASHRAE)
- Austin Energy Efficiency program
- Austin Energy Green Building
- Austin Energy Market Research data
- Austin Investors Interest (online, web-based multifamily apartment data)
- US Census
- CoStar (a commercial real estate market analytics company)
- Energy Conservation Audit and Disclosure ordinance data
- Environmental Systems Research Institute (ESRI) Demographics and Segmentation data
- Travis County Appraisal District
- Williamson County Appraisal District
- KEMA Study of Commercial Customer Peak Demand by Building Type

These data sets were used to assess the current status of rental versus ownership in the Austin Energy service territory and the rebate program participation rates between renters versus owners in both residential and commercial dwellings.

A primary assumption within this report is the use of homestead status as an indicator of dwelling ownership. As there is no other definitive data source of the Austin area renter population, the use of tax assessor data and homestead status of "nonexempt" used to indicate renter status Table 1 illustrates the proportion of Austin Energy service territory properties by utility customer type. This table is provided in order to give context to the percentages of renter/owner status across the customer base.

Table 1 – Commercial Building by Renter/Owner Status

Customer Rate Class	Description	No. of Customers Per Each Class	Average Usage (kwH/month)	Total Usage (MWh/yr)	% of Total Customers	% Total kWh	% of COM Customers	% COM kWh
Residential		385,518	913	4,223,735	89%	34%		
Secondary Voltage < 10kW (Sec 1 or S1)	Small offices, apartments, small warehouse, portable buildings, billboards/signs, small retail, dentist office, and small sanctuary	28,211	749	253,560	7%	2%	60%	3%
Secondary Voltage ≥ 10kW < 300kW - (Sec 2 or S2)	Office buildings, large retail, restaurants, warehouses, grocery stores, service establishments, schools, hotels, health care, and sanctuary	17,446	12,780	2,675,519	4%	22%	37%	36%
Secondary Voltage ≥ 300kW - (Sec 3 or S3)	Large office buildings, big box retail, large warehouses, large grocery stores, hotels, manufacturing, and hospitals	1,149	188,737	2,602,306	0.3%	21%	2%	35%
Primary Voltage < 3 MW - (Prim 1 or P1)	Office condos, utilities, large retail/grocery stores, manufacturing	102	442,741	541,915	0.02%	4%	0%	7%
Primary Voltage > 3 MW < 20 MW - (Prim 2 or P2)	Office campus, manufacturing, data centers, hospitals, water treatment plants	19	2,951,346	672,907	0.004%	5%	0%	9%
Primary Voltage ≥ 20 MW - (Prim 3 or P3)	Manufacturing	3	confidential*					
Transmission Voltage	Manufacturing	3	confidential*	623,793	0.00%	5%	0.015%	8%
Transmission Voltage ≥ 20 MW @ 85% aLF - (T2)	Manufacturing	1	confidential*					
	Total Commercial	46,934	13,086	7,370,000	11%	60%		

Austin Energy considers a number of factors when deciding the program portfolio. Considerations include City and utility specific goals including the Climate Protection Plan's zero carbon goal, local solar and increased efficiency of new construction as well as affordability and equity. Austin Energy also

considers economic analysis such as the customer's Return on Investment and the Demand Side Management Total Resource Cost Test. Programs must have a short payback to be attractive to customers, or program adoption will suffer. The acceptable payback varies by market segment. Commercial customers typically expect shorter returns on program investments than residential customers.

The Total Resource Cost (TRC) test is widely used in the utility industry to examine the cost effectiveness of programs. The test answers the question 'how much will the total costs of energy in the utility service industry decrease due to this program, and then expressing that value in comparison of program administration and customer costs to utility savings. The higher the TRC, the more cost effective the program. Table 2 shows the TRC and associated MW savings for the various energy efficiency programs offered by Austin Energy last year. The TRC varies by program. A comprehensive blend of programs is required to have a diversified program that meets both equity objectives and affordability goals for the utility while reaching a wide array of constituents. This table shows an excellent distribution of total MW savings across many segments, with segments having a high proportion of renters such as commercial and multifamily well represented in the mix.

Table 2 – Comparison of Total Resource Cost Tests for Austin Energy Energy Efficiency Programs

Program	TRC	FY16 MW Savings
GB- Commercial Energy Code	10.25	9.07
GB- Residential Energy Code	7.63	12.01
GB- Multifamily Energy Code	7.79	6.80
GB- Commercial Ratings	6.35	1.98
GB- Multifamily Ratings	3.94	1.42
GB- Residential Ratings	2.55	0.53
EES- Multifamily	2.16	3.26
EES- Commercial Rebate	2.01	7.90
EES- Home Performance ES - Rebate	1.30	1.24
EES- Small Business	1.27	3.71
EES- Appliance Efficiency Program	1.19	1.98
EES- Refrigerator Recycling	0.87	0.28
EES- Free Weatherization	0.45	0.64

Source - Austin Energy program data

A comprehensive, third party assessment of DSM metrics, measurement and verification and ROI's for all CES programs will be undertaken over the next two years as budget allows. An RFP is currently being drafted to secure these services.

Commercial

Based upon appraisal district data, the majority (over 99%) of taxable commercial buildings are leased space. Since 2007, Austin Energy has provided nearly 8,000 rebates for various types of commercial energy efficiency measures, delivered solar incentives for 256 commercial projects and impacted approximately 60,000 customers through code enhancements for Green Building participation as well as new and retrofit construction. Based on Green Building data, over 90% of these customers occupied leased spaces. While Commercial and Industrial customers make up about 11% of Austin Energy's total customers, they account for 60% of energy usage (see Table 1). For all of Commercial customers, small commercial accounts (<10kW) make up 60% of the customers, but use only 3% of the energy. Small to medium commercial accounts (10kW – 300kW) make up 37% of the customers and use 36% of the energy. All facilities included in the 28,000+ accounts in the <10kW rate class would qualify for the Small Business (SB) program and nearly all of the 17,000+ accounts in the 10kW – 300kW rate class would also qualify. Therefore, it is assumed that there is a substantial population of small businesses with high

efficiency lighting needs. These customers are primarily renters. However, in FY 2015 SB accounted for 54% of the total Commercial rebates paid (excluding Multifamily) and in FY 2016 the program is accounted for 43% of total Commercial rebates.

This is an important consideration when examining relative program participation, since commercial energy efficiency programs have the potential to impact over half of Austin Energy customer energy usage. A potential study conducted by global energy consultancy KEMA in 2012, segmented commercial customer peak demand and end uses as shown in Figure 1 and Figure 2.

Figure 1. Commercial Customer Peak Demand - Building Type

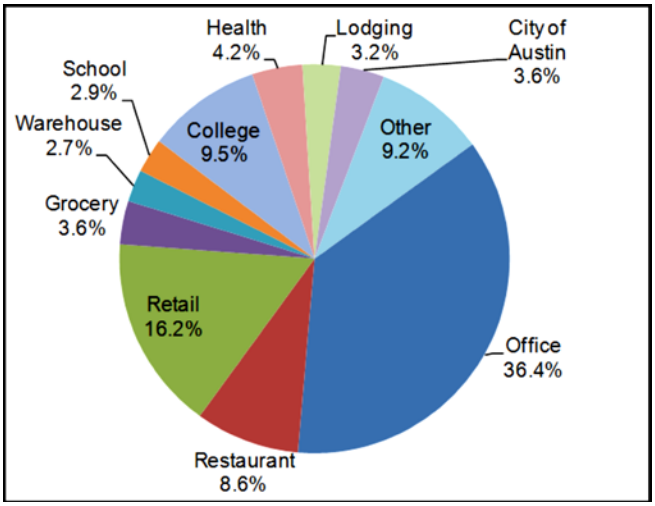
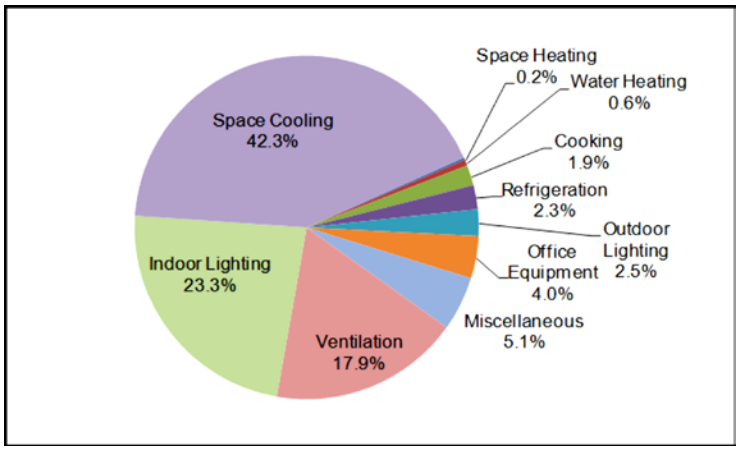


Figure 2. Commercial Customer Peak Demand by End Use



KEMA DSM Market Potential Study – Austin Energy, July 12, 2012. Excludes Industrial Sector

Understanding this information is critical to understanding the energy efficiency potential for key segments, as it is a defining element of market potential for programs.

A challenge to customer adoption of any utility DSM program is that the majority of commercial tenants lease rather than own. Tenants who are willing to take on risk seek to mitigate it by demanding short paybacks (one year or less) on investments to occur before their lease expires. This is one reason why the small business lighting program is so successful. Unfortunately, larger equipment investments, such as HVAC or chillers, have paybacks that are too lengthy ranging from 4 to 27 years for HVAC packaged systems and 10-12 years for chillers in office buildings even with a very substantial rebate investment on the part of Austin Energy.

The industry has created several financing tools, such as Property Assessed Clean Energy (PACE) financing, which is helping overcome some of these financing challenges. Designing utility programs targeted at building owners is equally challenging. The owner of a leased building is generally not paying the electric bill, but rather is passing any energy costs on to the tenant. This owner/lessee conundrum is often referred to as a "split incentive". It is a challenge seen in the multifamily space as well. However, Austin Energy programs have resulted in successes by designing programs that meet the needs of both the lessee and the owner to successfully reduce energy consumption in the commercial sector.

Commercial - Energy Efficiency and Demand Response

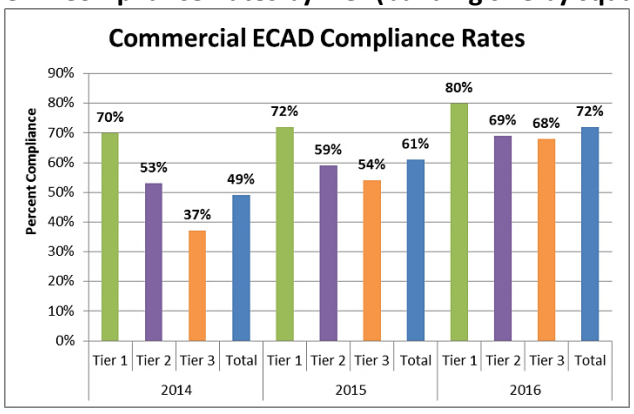
Commercial demand side management (DSM) consists of energy efficiency and demand response programs. These programs have been developed over the years to provide a balanced portfolio of programs to maximize overall savings of energy and demand reduction in accordance with City goals,

while blending program offerings to reach all market segments. All DSM programs are subject to a rigorous test examining the Return of Investment (ROI) to the customers as well as to the community as a whole. As market conditions change, new programs are developed while existing ones may be enhanced or retired. New technologies and manufacturer standards create innovative opportunities. Program participation and reach varies by market segment and program. Since 2007, over 3,700 rebates have been provided for energy efficiency new construction and retrofits for commercial spaces with another 3,800 for small businesses. In addition, more than 5,000 commercial and small business customers participated in demand response. Tools such as web apps, remote energy audits and Energy Profiler On-line provide subscribing customers the ability to monitor their usage and modify their consumption patterns to reduce costs. Remote energy audit tools assist large commercial and industrial customers in the development of strategic energy efficiency plans and the ability to target specific energy efficiency opportunities (such as demand control ventilation), prioritize operational savings and track the building performance over time. Benefits of this type of tool include assisting with energy account plans, providing insight into additional energy efficiency opportunities and lowering the cost from on-site engineering audits impacting a larger number of customers. Monitoring over time can verify savings and find additional opportunities while increasing participation in energy efficiency and demand response programs.

In addition to rebate and building opportunities, Austin Energy has expanded the education, marketing and outreach in the community. Austin Energy participated in numerous community events, speaking and networking to share information about energy efficiency and low cost energy savings opportunities the utility provides. In FY 2016, staff participated in in over 250 events with attendance in excess of 200,000 people. Additionally, Engineering and Key Accounts Staff work with customers to identify various energy efficiency measures and behavioral changes with potential energy consumption savings. New energy efficiency programs need to be able to provide the rapid ROI for the commercial customer to see the immediate energy savings to offset the investment within a typical lease agreement. Austin Energy is continuously monitoring the industry to identify cost effective energy efficiency measures. Research and studies on various technologies are ongoing. A current study includes mini split-system air-conditioners. These systems may be advantageous where extending or installing ductwork is not practical. Austin Energy has retained a consultant to assist in investigating the benefits of mini-splits in the multifamily sector. This study should be complete by 2017.

Another area where commercial customers have been positively impacted is that of the Energy Conservation Audit and Disclosure (ECAD) ordinance. Since being established, the ECAD ordinance has created awareness to customers on the amount of their consumption as it compares to others. An example of this is shown below in Figure 3. The commercial sector continues to increase participation in benchmarking as is noted in the uptake in compliance rates across all square footage tiers.

Figure 3. Comparison of ECAD Compliance Rates by Tier (building size by square foot)



Source - Austin Energy ECAD program data

One of the measures within the process of reporting for this ordinance is an Energy Use Index (EUI). An EUI is expressed as the energy used per square foot of a building. Time-series analysis indicates a gradual decrease in the EUI across all three tiers (building size by square foot) in the commercial sector, indicating less energy use per square foot in commercial buildings. By helping commercial building owners become more aware of the energy use in their buildings and by learning ways to reduce their consumption through energy audits and education along with incentives to reduce the initial cost of implementation, they are taking actions to reduce energy use which benefits the renters through lower energy consumption. Austin Energy's rebate program incorporates verification of appropriate scope and quality of installation before providing the rebates to reduce the costs.

Commercial - Solar

For Solar customers, "commercial" refers to any non-residential accounts. Commercial participation in the Solar Program sounds modest when considering the total number of projects – 256 projects for approximately 46,000 customers – but with about 0.5% of commercial customers participating; it is on par with other utilities with robust solar markets. When looking at the total installed capacity, commercial customers have installed over 13,000 kW of solar photovoltaic (PV) systems, accounting for approximately 34% of incentivized capacity. Table 3 provides detailed Solar rebate and energy data. The commercial sector is well represented by the percentage of capacity incentivized within the Solar Program.

Table 3 – Solar Rebate and Energy Production Data

Solar PV Incentives by Customer Class 2004-Current						
	# of Projects	kW	kWh	% of kW	Incentives Paid or Committed	% of Incentives
Residential	5,202	23,787	38,109,818	62%	$54,329,451	64%
Multifamily	214	1,490	2,559,223	4%	$4,522,469	5%
Commercial	256	13,042	21,918,706	34%	$26,374,524	31%
Total	5,672	38,319	62,587,747		$85,226,444	

Source- Austin Energy Solar Program Data

The primary tool for incentivizing commercial solar is a Performance Based Incentive (PBI), which provides an incentive to the customer based upon the actual production of the installed PV array. This program has been most successful in reaching customers that own the building they occupy. Marketing vehicles for this program have primarily been through contractor channels and the Austin Energy website.

As with energy efficiency measures, the primary challenge in the commercial solar sector is convincing businesses to invest in a technology with a large capital cost and relatively long payback period when it is not central to their core business. Additionally, PV projects on leased properties suffer from the same split incentive issues referenced earlier. The owner, therefore, is unlikely to install solar unless they are highly motivated for environmental reasons, believe it will make their property more marketable, and/or they are able to recover their costs through increased rents. As Austin Energy develops its community solar program, and enrolls more capacity, staff will investigate the possibility of developing a community solar offering to meet the needs of commercial customers, particularly those in leased

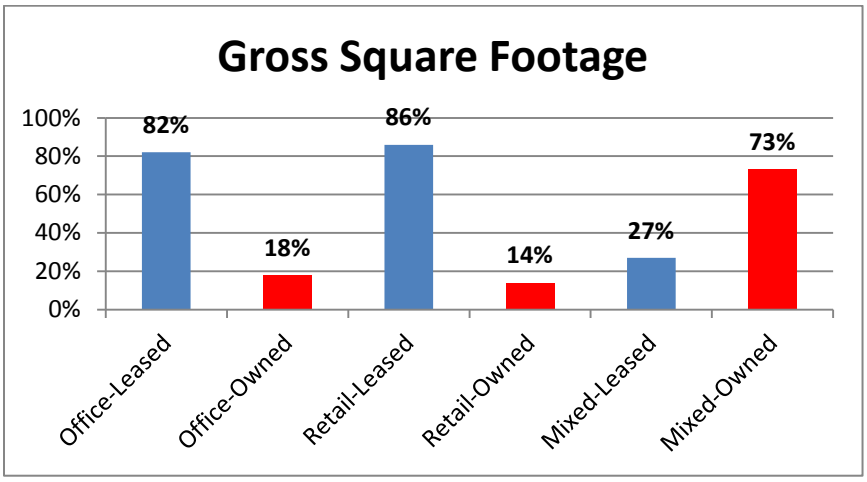
spaces. Finally, as highlighted in table 3, since many in the commercial sector are renters or lessees, this population may be benefiting from those building owners participating in the Solar PBI program.

Commercial - Green Building

Green Building impacts energy efficiency through regular updates to the Energy Code and through Green Building ratings. Updates to the Energy Code are applied uniformly to rental and non-rental properties for new construction and equally effect new rental properties as they do non-rental properties for all market segments.

Green Building Ratings for commercial projects in Austin fall into two categories, mandatory and voluntary. All new construction in the Central Business District and Public Utility Districts are required to earn a Green Building Rating. Project participation in the commercial sector is tracked by three categories: Office, Retail and Other/Mixed. The ratio of leased/rented to owned properties varies widely by category, with Office and Retail sectors having higher participation for total projects and square feet for leased/rented properties. Participation for properties in the Other/Mixed category favored owned properties for both total projects and gross square feet. Figure 4 shows the relationship between square feet and number of Green Building projects across the various commercial sectors.

Figure 4. Comparison of Leased vs. Owner-Occupied Commercial Space for Green Building Rated Buildings by Gross Square Footage



Source - Austin Energy Green Building program data

Overall, renters/lessees are well represented from the perspective of program participation. A key take away from the Office and Other/Mixed categories is that kWh savings per project and per square foot heavily favors leased/rented projects. Anecdotally, potential occupants state that energy costs are part of the decision matrix when considering a lease agreement. A more energy efficient building provides a competitive advantage for the building owner. Technologies applied in the course of administering ratings for the commercial segments are not differentiated by owner-occupied versus leased/rented but marketing and outreach have been tailored uniquely to owners and lessees as appropriate. Future plans call for Green Building to continue a balanced outreach plan and program mix to try and maintain similarly balanced results for both renters and owners moving forward.

Residential

The residential sector is comprised of two distinct dwelling types associated with the building code - single and multifamily. Table 4 provides a breakdown of market segments and the mix of owners and

renters for each. Overall, between 55-60% of people in Austin live in rented dwellings including single-family homes, apartments and mobile homes. Over 20% of all single-family homes are rental units, based upon the homestead exemption in the Travis County and Williamson County appraisal district data (see Table 4). Multifamily units include properties with multiple units, including apartments, condos and townhomes. Nearly 85% of tenants in the multifamily segment are renters. As with the commercial segment, challenges abound in the residential segment. The split incentive issue comes into play for renters in the residential sector and poses challenges for program adoption similar to those in the commercial sector. These customers pay into the tariff that funds energy efficiency and demand response programs, but the building owner has little incentive to invest, especially in a housing market characterized by high demand and low vacancy rates.

Table 4 – Percentage of Renter and Owners by Dwelling Type by Exemption Status

State Dwelling Code	Owner	Renter	Total Number of Taxable Dwellings
COMMERCIAL CONDO	0.0%	100.0%	606
COMMERCIAL IMPROVED	0.4%	99.6%	26,769
COMMERCIAL RES CONVERSION	2.1%	97.9%	34
CONDOS	62.2%	37.8%	3,250
DUPLEX	17.7%	82.3%	17,548
TRI-PLEX	12.6%	87.4%	387
FOUR-PLEX	2.4%	97.6%	4,143
MULTIFAMILY	0.1%	99.9%	106,444
SINGLE FAMILY RESIDENCE	77.9%	22.1%	156,241
SINGLE FAMILY RESIDENCE MOBILE HOME	51.1%	48.9%	2,325

Source - Austin Energy program data; Appraisal Data

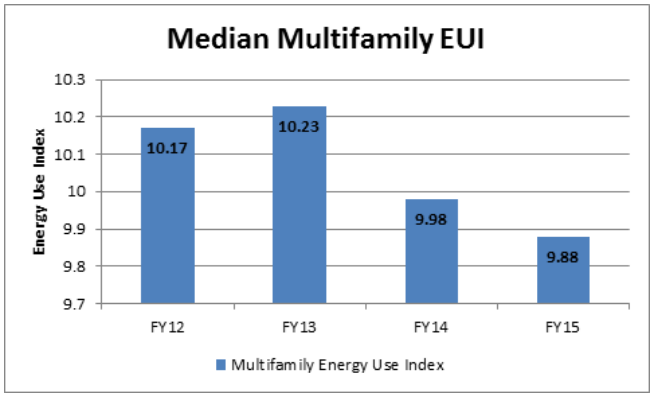
Residential - Energy Efficiency and Demand Response

Existing Programs

Since 2007, nearly 200,000 rebates and weatherization services have been provided by Austin Energy for single and multifamily customers for projects addressing air infiltration of the building shell, air ducts and HVAC repairs or retrofits. Over 65,000 customers have participated in demand response. Renters participate in current programs such as Multifamily, Power Partner Thermostat (PPT), Home Performance with Energy Star (HPWES), Low Income Weatherization, Appliance Efficiency Program (AEP), the tier awareness app and retail point of sale rebate program. For HPWES and AEP alone, approximately 21% of rebate participation in the single family segment is by renters. This renter participation approximates renter occupancy of single family homes (25%)

Similar to the commercial sector, program reach and energy codes have improved the energy utilization index (EUI) of multifamily properties over time. Figure 5 demonstrates this.

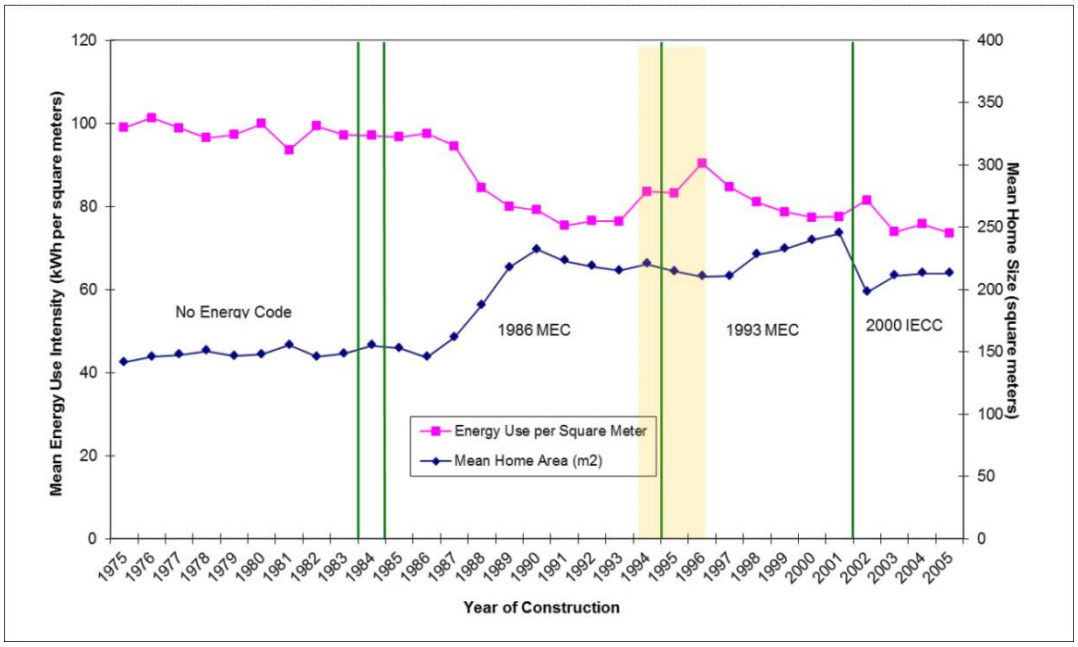
Figure 5- Median Energy Use Index for Austin Energy Multifamily Customers



Source - Austin Energy program data

Analysis shows that homes built between 1965 and 1985 are the best candidates for these programs as they most often have the greatest energy savings post-retrofit. Figure 6 demonstrates this savings in relation to age of home and energy codes. These homes have between 18% and 24% representation with strong adoption of current programs and room for growth. Focus on this market segment will be continued. Austin Energy continues to market and provide education especially to those homes that would receive the most benefit from participating in the Home Performance with Energy Star program.

Figure 6. Impact of Energy Codes on Home Size and Energy Use over Time

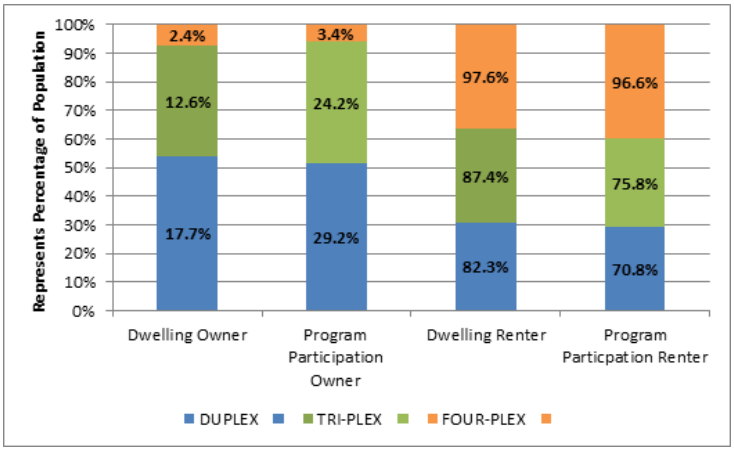


Source - Austin Energy, TCAD and code data

Another area where Austin Energy is meeting and exceeding expectations, based on the ratio of participation to population, is with duplexes, triplexes and four-plexes. Figure 7 shows the ratio of program participation for owners and renters in duplexes, triplexes and four-plexes. Program participation is very high for renters in duplexes, triplexes and four-plexes. Additionally, the percentage of participation by owners of duplexes and triplexes exceeds their representation of the population,

indicating a greater level of participation than expected for this segment. Given that many duplexes and triplexes house renters, this would increase the number of renters benefiting from the rebate programs.

Figure 7. Comparison of Building Owner/Renter Ratios to Program Participation Owner Renter Ratios



All of these building types are largely occupied by renters. Based on the percentage these dwellings account for in the population and the percentage they account for in rebate participation, there is a greater percentage of rebate participation than one would expect. It appears customers owning and/or living in these dwellings are current participants in energy efficiency rebate programs and are seeing the benefits of participation.

Source - Austin Energy program data

In 2013, the American Council for an Energy Efficient Future (ACEEE) completed a review of leading multifamily programs and identified 10 best practices among these programs (Johnson 2013). Table 5 shows these best practices for Multi-family and extrapolates them out to include single family and commercial.

Table 5 - ACEEE Best Practices Utilized In Austin Energy Programs by Customer Segment

Best Practices Recommended	Single Family	Multi-Family	Commercial
Provide a one-stop shop for energy efficiency program services	✓	✓	✓
Incorporate on-bill repayment/**low-cost financing**	✓ Financing [4]	Support PACE	Support PACE
Integrate direct installation & rebates	✓ Both	✓ Rebates	✓ Rebates
Streamline rebates and incentivize in-unit measures to overcome split incentives	✓	✓	✓
Coordinate programs across electric, natural gas, and water utilities	Partnerships with Texas Gas & Austin Water	Partnerships with Texas Gas & Austin Water	Partnerships with Texas Gas & Austin Water
Provide escalating incentives for achieving greater savings levels	✓	✓	✓
Serve low-income households	✓	✓	n/a
Align utility and housing finance programs [5]	✓	✓	n/a
Partner with the local housing industry	✓	✓	✓
Offer multiple pathways for participation to reach more buildings [6]	✓	✓	✓

New Programs in Development/Review

[4] Loan program with Velocity Credit Union for Home Performance with Energy Star Program. On bill repayment could be done for homeowners (not renters) but would require lien

[5] Also partner with Family Eldercare, Austin Fire Department, Neighborhood Housing, Housing Repair Coalition and Housing Authority of Central Austin (HACA) for single and multi-family program delivery and/or financing

[6] Includes point of sale discounts at over 70 retail locations, outreach at 200-250 events annually, consolidated organization, website functionality.

A new proof of concept program in the multifamily sector specifically supports lower income customers by focusing on apartment properties with higher proportions of low income residents Applicant properties must be served by Austin Energy electric utility, meet the multifamily criteria and qualify as low-income housing. For this proof of concept, potential projects include the properties listed in the Austin Tenants Guide to Affordable Housing. Additional information can be found in the multifamily section of the Austin Energy website. This program, launched late FY2016, focuses on energy efficiency at higher rebate levels for lower income apartment communities. The Resolution explicitly calls for an assessment of the feasibility and cost effectiveness for HVAC replacements in the multifamily sector. HVAC replacement is not cost effective, however during the time period of 2008 through 2014 due to almost $10 million received in federal grant funding from 2008-2012 and from 2012-2014 with the weatherization contract, Austin Energy was able to offer this as a measure incentive. As of 2015, HVAC replacement was removed from the weatherization assistance program offerings due to the cost effectiveness.

Austin Energy is working to find workable solutions in this area. A proof of concept program was deployed in 2016 for AC tune up which offers comprehensive maintenance to those customers that qualify for the weatherization assistance program. Customers needing new AC equipment are forwarded to the various community partners. An evaluation of mini split/heat pump units in multifamily units is in the planning stages. This will study the impact of the higher efficiency equipment and determine a savings yield.

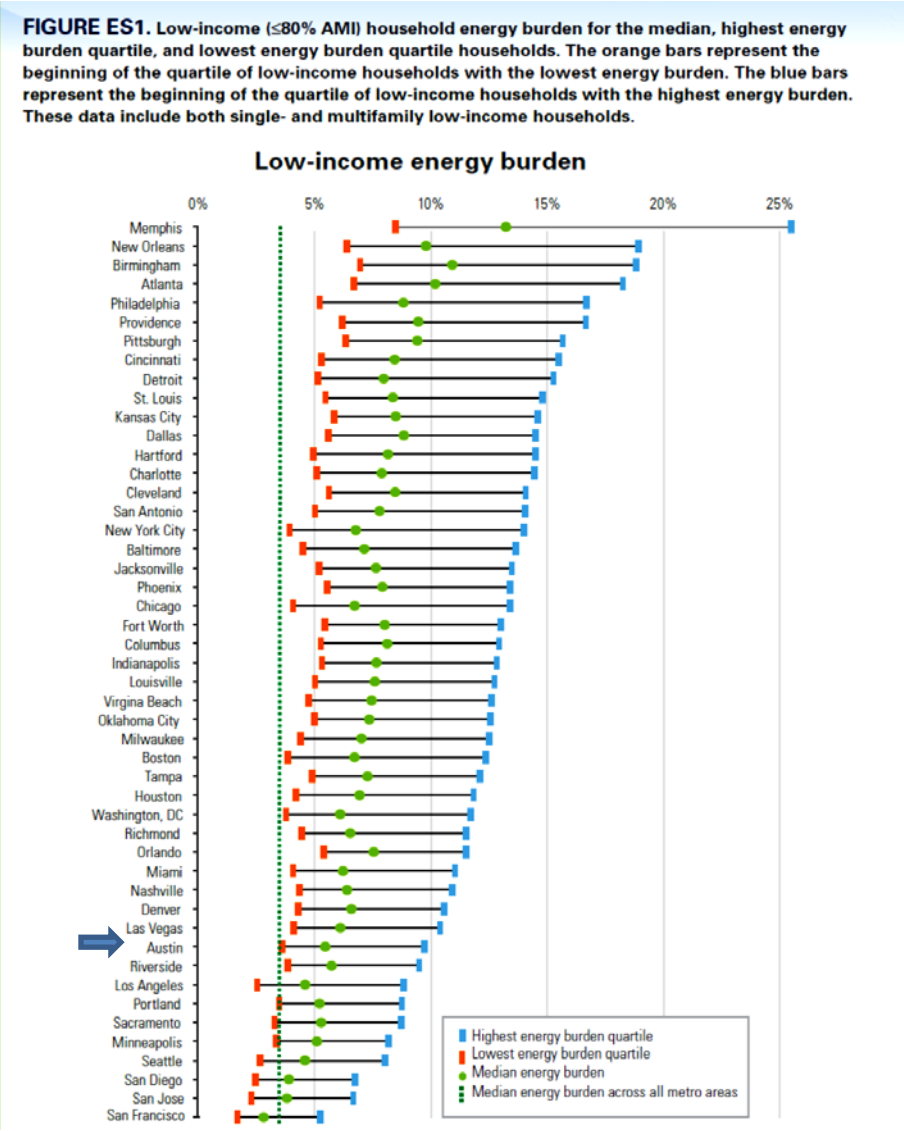
Staff also is designing a program that will allow owners and managers a way to make efficiency improvements as part of the make-ready (apartment turnover) process that can then be paid on a quarterly basis rather than requiring the project be completed throughout the property at one time. This will provide additional incentive for the smaller apartment owners that have limited cash flow. We are also exploring the design of an HVAC tune-up for efficiency improvements that use emerging technologies, such as electronic expansion valves.
As with the commercial and single family programs, the current multifamily programs are reaching the multifamily sector. One potential area for growth is education and outreach, in particular as it relates to the impacts that customer behavior can have on total energy use. With the transitory nature of apartment dwellers, teaching people how to live in recently retrofitted apartments is important. Behavior is often a key component to energy savings in the multifamily sector. Enhancing engagement with the multifamily community to build educational and outreach programs for prospective, new and current tenants will help them better live in their new energy efficient homes. For those customers with low levels of energy use, employing energy efficiency measures will not garner much in energy savings but may actually create a snapback effect, creating an increase in energy use based on the perception of a more energy efficient dwelling.

There is no definitive correlation between income and energy use. While many low income customers live in rental units, this is not absolute, and not all who live in rental units are low income. There is an increasing trend toward renting a residence. Low income customers do not consistently use more or less energy than their higher income counterparts. People who rent do not use more or less energy than those who own their homes. The use of energy is as much behaviorally driven as it is income-based or a function of dwelling type.

Although there is no direct correlation to income and energy use, evaluating the effectiveness of energy efficiency measures with respect to customer bills through comparison is possible. ACEEE's comparison of low-income energy burdens in 50 large metropolitan areas, shown in figure 9, places Austin as 10th lowest of 50 municipalities, and the lowest in Texas. Of the 5 municipalities in Texas, Houston comes in next at 18, with Fort Worth, San Antonio and Dallas ranging from 28th to 38th out of fifty on the list. The key takeaway here is that the typical low-income resident in Austin pays less out of pocket monthly as a

percentage than residents of other Texas cities. Austin Energy's energy efficiency programs and City energy codes are part of the equation for lower energy burdens.

Figure 8. ACEEE Comparison of Low-Income Energy Burdens by Municipal Area



Residential - Solar

Single family participation in the Solar Program has been consistently strong, with 5,200 residential PV projects receiving incentives from Austin Energy. The incentive has come in the form of an upfront payment based upon the prevailing dollar per Watt rebate. Approximately 90% of the projects incentivized have been single family projects, with approximately 24,000 kW, or 62% of the program's capacity from this segment. While the sector has been very well represented from a participation perspective, there are still significant barriers in the sector, ranging from long paybacks (approximately 10 years with rebates), shading due to trees, poor roof condition or orientation, and challenges getting affordable financing to pay the considerable upfront costs of solar projects, particularly for customers with low credit scores. These challenges are further exacerbated by the owner/renter relationship in rented residential properties.

Solar participation for multifamily projects has been limited, with 196 projects to date, most of which have been on condos or townhomes. Approximately 5% of incentivized PV projects have been in this sector, accounting for 4% of the incentivized capacity. The reason for this correspondingly low participation is due to a number of challenges facing solar installations on multi-tenant properties. One of these challenges is the split incentive spoken to in other sections of this report. In multifamily residential properties or multi-tenant commercial properties, there is added physical complexity and cost to tie in solar installations to each individual unit's electric meter. If multi-tenant properties do install solar, it is generally limited in size to match the electric loads from the common areas of the property, which are paid for by the owner or property manager. Since federal solar incentives are provided as a tax credit and through accelerated depreciation, many customers without tax liability are unable to monetize those federal incentives, making it hard, if not impossible, to make a solar installation meet minimum payback requirements, even with Austin Energy incentives. This affects affordable housing providers and other non-profits, as well as businesses and homeowners without tax liability.

Despite these inherent barriers, Austin Energy has supported solar installations for multifamily properties, including affordable housing properties, through the Solar Incentive Program. To date, these have primarily been master-metered properties. The most noteworthy example is Foundation Communities, which has received incentives to install solar at eight of its properties. The latest such project was a 111.35 kW-AC solar system at Homestead Oaks, a 140-unit low income, affordable housing development designed to maximize energy efficiency, water conservation, access to social services, green spaces and personal development opportunities.

Austin Energy is currently looking at two key initiatives to address renters' challenges of limited access to solar. Austin Energy is launching a Community Solar program this year that will expand access to solar energy to those unable to put solar on their own homes as well as those who live in multifamily buildings or rent. Austin Energy is developing larger solar systems across the service territory, taking advantage of economies of scale to help reduce costs, and making solar energy available to residential customers who subscribe to the program. There will be no upfront costs to participate, and the participants can opt out at any time. This was an important factor for renters who "do not want to make a commitment longer than my lease," as was heard at Austin Energy focus groups during program development. Subscribers will see the traditional Power Supply Adjustment (PSA) on their electric bill replaced with a Community Solar Adjustment (CSA). While the CSA will be higher than the PSA to start, reflecting the higher cost of local solar energy compared to power purchased from the ERCOT market, the CSA will be fixed or "locked in" for subscribers, shielding them from fluctuations in market prices. While the program will be open to all residential customers, outreach will be targeted to the renter community. Details at: http://www.austinenergy.com/go/communitysolar.

Austin Energy is also developing a fractional metering proof of concept program that will enable multifamily properties to install a single solar system onsite and allocate generation credits to tenants' electric bills, thus reducing installation costs and complexity and enabling renters to directly benefit from solar. This solution could help both affordable and market-rate multifamily properties to install solar more efficiently, and allow their tenants to benefit from reduced utility costs. The property owner or developer may leverage federal tax credits and depreciation and pass on remaining costs through rental rates over the life of the system, which would be more than offset by the electric bill savings.

Austin Energy will continue to look for opportunities to partner with multifamily developments to encourage and include solar, including finding ways to monetize federal tax credits, overcome split incentives, and procure solar from off-site locations if their own property is not a good candidate for solar. Through marketing and outreach, Austin Energy will encourage those unable to install solar to join the Community Solar Program to enjoy the benefits of renewable energy.

Residential - Green Building

Green Building impacts energy efficiency through regular updates to the Energy Code and through Green Building ratings. Updates to the Energy Code are applied uniformly to rental and non-rental properties for new construction and equally effect new rental properties as they do non-rental properties.

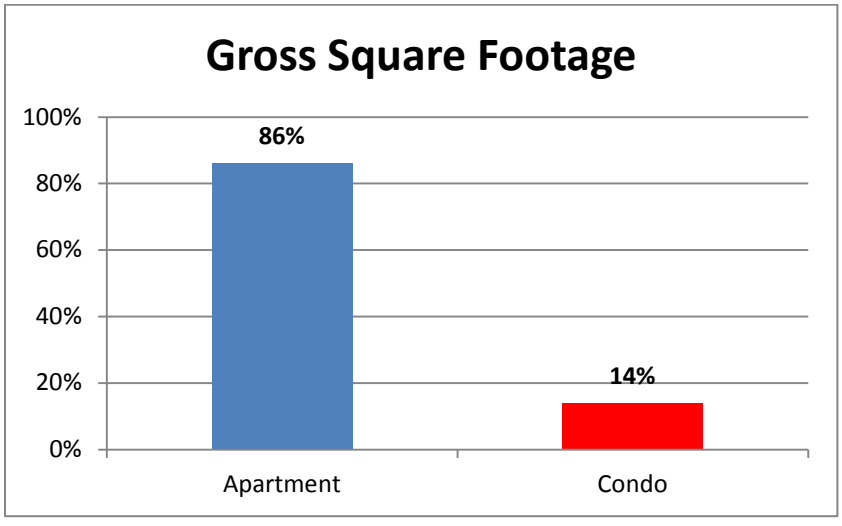
Like the commercial sector, Green Building ratings for the residential sector fall into mandatory and voluntary categories. Since 1999, Austin Energy Green Building (AEGB) and Neighborhood Housing and Community Development Department (NHCD) have had a Memorandum of Understanding in place that requires all affordable housing built in Austin and receiving incentives from the City of Austin to achieve at least a one-star rating from AEGB. This includes both single family homes and multifamily properties. Austin Energy Green Building ratings apply to the entire building.

To successfully earn a rating, the development team must show that any rental spaces also meet the rating requirements. All new construction in the Central Business District, Public Utility Districts and properties participating in S.M.A.R.T. housing are required to earn a Green Building rating. The Austin Energy Green Building multifamily rating applies to multifamily and mixed use projects up to 6 stories tall while the multifamily properties seven stories and greater use the Austin Energy Green Building commercial rating. All data for Green Building multifamily referenced herein combines the two segments.

The Austin Energy Green Building single family rating applies to single family homes, duplexes, and townhomes. Over 13,000 homes have been rated through the program to date. Currently, there is no data to determine the percentage of these that are owned properties versus rented. However, we can assume that a portion of these homes are occupied by renters as we noted in the single family energy efficiency data.

Looking at the data available for rated multifamily projects in Austin shows that program participation is significantly higher for rented (apartments) versus owned (condos) units/projects and total square footage. Figure 10 shows the relationship between s apartments and condos (renters and owners). Energy savings per unit/square feet favors owned units.

Figure 9 – Comparison of Green Building Program Participation for Leased (Apartments) vs. Owner-Occupied (Condos) Space by Gross Square Footage



Source - Austin Energy Green Building program data

To date, marketing and education outreach efforts in the multifamily sector have been fairly evenly divided across owned and rented projects, on a per project basis. Educating prospective residents about the benefits of living in a Green Built building, particularly the energy savings, can be very challenging. In response to this, Austin Energy Green Building is working to develop an apartment guide which will be an interactive tool allowing potential renters to look at the estimated energy burden and usage for all rented units in the city based upon historical usage from similar units, allowing them to figure these costs in their decision about what unit to rent. The next step will be to develop an application allowing owner occupied residents, for both single family residences and condos, to use a similar calculator to estimate their energy burden based upon a number of indicators including: year the dwelling was constructed, square footage, and participation in Austin Energy rebates and efficiency programs, prior to committing to buying a home.

Conclusion

Over the past thirty years, Austin Energy has successfully provided rebates for property owners and renters and to commercial, single family and multifamily customers. Since 2007, Austin Energy has provided over 370,000 DSM incentives and benefits to residential and commercial customers, with renters receiving a representative share of those benefits over time. In addition to current product offerings, we are constantly in the process of evaluating new programs.

New products and services currently under consideration and development include:

- Development of enhancements to the web app for residential and commercial customers
- Development of a community solar program, including a targeted offering for low-income customers
- Development of fractional metering to allow easier access to solar for multifamily properties
- A study of the benefits of mini-splits in the commercial and multifamily sectors
- Free high bill assessments for residential and small commercial customers, with appropriate referrals
- Remote energy audits for commercial customers
- Expanded direct install program
- AC tune-up program
- A comprehensive assessment of DSM metrics, measurement and verification, ROI's for all CES programs
- Apartment residents energy (electricity) estimate web app

Programs will be enhanced with increased and more targeted education and outreach to build participation through increased awareness of our programs and their benefits.

Austin Energy focused on additional resources for all market sectors for outreach into the community. This included coordinating with other city departments at customer sites, concentrating on underserved markets, creating packages of energy efficiency measures that are appropriate for traditional markets, and promoting cost effective, but under-utilized technologies such as demand controlled ventilation.

Austin Energy will continue to look for opportunities to partner with multifamily developments to encourage and include solar, including finding ways to monetize federal tax credits, overcome split incentives, and procure solar from off-site locations if their own property is not a good candidate for solar.

As Austin Energy continues to work toward the goals laid out in the current Generation Resource Plan that include an additional 800 MW of Energy Efficiency and Demand Response by 2020 and 900 MW by 2025 , renters and lessees have been and remain a part of the success in both the residential and commercial sectors. Moving forward, they will continue to be a focus for future success.

APPENDIX 6.1

RESOLUTION NO. 20160811-033

WHEREAS, the City of Austin and Austin Energy have pursued energy efficiency efforts since 1982, with the goals of reducing the need for new energy generation resources, lowering utility customers' bills, and reducing power plant emissions; and

WHEREAS, despite saving 1,200 megawatts of peak energy demand since these programs began, rental buildings and certain types of equipment tend to have lower levels of participation in energy efficiency programs; and

WHEREAS, increasing energy efficiency program participation may require strategic approaches that vary from those of current programs, including targeted education, marketing, outreach, and financing options; **NOW, THEREFORE,**

BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF AUSTIN:

The City Manager is directed to assess the feasibility and cost-effectiveness of new or expanded energy efficiency programs, including direct installation programs and solar programs, targeting low participation customer segments, such as rental properties, and low participation equipment types. These incentives may include: (1) building shells, air ducts, and Heating, Ventilation and Air Conditioning ("HVAC") repairs or retrofits for rental residential facilities of four or fewer dwelling units; (2) HVAC repair or replacement for rental multi-family facilities of five or more dwelling units; and (3) energy efficiency repairs or retrofits for commercial rental spaces.

BE IT FURTHER RESOLVED:

The City Manager is directed to report back to Council regarding the feasibility of new or expanded energy efficiency programs by January 15, 2017.

ADOPTED: August 11, 2016 **ATTEST**: Jannette S. Goodall
City Clerk