Austin Energy White Paper

Potential Demand Side Management MW Savings by 2025, 2027 and 2029 – An Assessment of Projections and Market Conditions Impacting Goal Achievement

Austin Energy, City of Austin

Contents

Potential Demand Side Management MW Savings by 2025, 2027 and 2029 – An Assessment of Projections and Market Conditions Impacting Goal Achievement

Introduction

The purpose of this analysis is to provide a preliminary assessment of the potential Austin Energy Demand Side Management (DSM) megawatt (MW) savings by 2025, 2027, 2029. This analysis is to also include a feasibility assessment for achieving 300 MW (of the total MW goal) derived solely from demand response (DR) programs. This is a preliminary assessment to be followed by the more formal, third-party study currently underway by DNV-GL. It is anticipated that a brief, high level study will be available by the end of calendar year 2019 with a more robust report available mid-2020. The data provided here are projections only and may be impacted by factors unknown at the present time, but that may surface over the next 5 to 9 years.

This report will not be providing any analysis or estimates for renewable energy goals. The focus of this report is energy and demand reduction savings.

Executive Summary

Some key takeaways from this preliminary analysis of potential DSM megawatt savings are:

- Savings from 2020 to 2025 and beyond will be impacted by several factors including market conditions, budgets and changing technology.
    - Market conditions include current market penetration, historic market saturation and potential market transformation. The level of customer participation over the past 30 years, combined with current and new technologies, will impact and influence MW savings achievement through 2029.
- Building codes will be impacted by recent state legislation[1] impacting potential future MW savings that may be claimed as part of the Austin Energy Green Building program.
- The renter population in Austin impacts the reach of rebate programs. (Split incentive wherein the property owner provides any capital and tenant benefits from the improvements. Additionally, the competitive rental market and low occupancy rates in Austin create an added barrier to program adoption.)
- Returning program participants generate less MW savings than first time participants due to more efficient homes/measures.
- The Customer Energy Solutions (CES) analysis is supported by both the 2014 KEMA study and the AE Financial staff analysis.

[1] See Texas HB 2439, effective September 1, 2019.

- The estimated CES DSM MW savings forward to 2025, 2027 and 2029 are projected to be 1100, 1200 and 1350, respectively.
- This would assumes DR savings of 200 MW by 2025 for nearly all models and by 2027 for all models.
- No model was shown to achieve 300 MW in DR by 2027 or 2029.
- Note that these are modeled goals. These will most likely change and adjust with input from the DNV-GL benchmarking project currently underway.

In summary, the ability to reach 1100 MW by 2027 appears achievable. However, there remain unknown and unforeseen market and financial conditions which may impact and influence the achievement of these goals.

Data Sources

Data and reports used for this analysis include current Customer Energy Solutions annual progress reports; the 2012 KEMA study (revised 2014), assessing goals to 2020; and Austin Energy Finance DSM Program Goals analysis. Portions of the data for this analysis were used from these reports without including the full reports. For reference, the KEMA study can be found at https://austinenergy.com/ae/about/reports-and-data-library/customer-energy-solutions-program-updates.

Methodology

Multiple steps were taken to provide the final estimates of savings for 2025, 2027 and 2029. The final assessment will be based on an analysis of program potential as of September 2019 with support from historic reports.

Assess Current State and Compare Future Estimates across Each Study

As the reports contain estimates, predictions and models, each report varied in its methodology of calculating potential savings. The consistent information was retrieved from each report and moved to the next stage. Anomalies were noted and removed where necessary. For example, the MW savings for Emergency Response Service (ERS) in 2016 was removed in calculating future trends in savings as it is unknown at this time if that level of megawatt savings can be achieved again in a single year from the ERS program.

Each study had a slightly different end year of projection. CES projects savings to 2025. AE Finance projects savings to 2030. The KEMA study projected savings to 2020. These estimates were compared in terms of actuals achieved and MW predicted in years between 2012 and 2018. Additional comparisons included the projections for 2019 and 2020. These were noted as trends or anomalies. However, as the KEMA and AE Finance studies are were used as supporting resources, these differences were noted but not adjusted. The final analysis uses only the predictions from the CES estimates. These were then compared to the KEMA study and AE Finance analysis for validation of results. As all

numbers, within the years 2020 to 2029, were similar, no adjustments were needed on the supporting reports.

Each analysis also used differing methods for predicting future annual savings. These differences were retained but should be noted as the annual differences do not match CES actuals, thus may impact totals for 2025 and beyond.

As studies were compared and assessed against actuals, adjustments were made to calculate what the new totals might be. For example, AE Finance began tracking in 2003. The baseline for the current MW goal is 2007. The early Finance goal years were backed out to begin all tracking at the first goal year, 2007. Any resulting totals for 2025 and beyond should account for years starting in 2007.

Apply Known and Predicted Program and Market Changes

Assessments attempted to adjust for possible market changes and potential program changes. Lighting will have less of an impact in the coming years. Most programs are based on currently standards and expected installations. While it is not expected that customers will return to former lighting standards based on recent Department of Energy rulings (https://s3.amazonaws.com/public-inspection.federalregister.gov/2019-18940.pdf) on lighting, these new regulations may impact future installations.

As appliances become more efficient, with longer lifespans, the return rate for customers is reduced. Effective with fiscal year 2020, the impact of Green Building designs will be tracked with a different baseline based on increased energy efficiency levels in the City of Austin energy code. The baseline will move from the year 2000 to 2008. This move accounts for more recent building codes, thus, reducing the savings to be achieved above code. There are specific reasons for considering updating the code baseline. The first reason is consistency with best practices in the industry. Baselining for tracking deemed savings is a best practice, but the particular code selected as the baseline is dependent upon a number of variables. For Austin Energy, it was originally anchored to the 2001 code because that was the code which was adopted by the City when the Climate Protection Plan was first developed in 2007. Over time, as subsequent codes have been adopted, the baseline got further from the current code with ever more efficient versions having been passed. This results in savings appearing inflated. Changing the baseline better aligns deemed savings with current code. The second reason for updating the code baseline is to be consistent with other industry leaders. The 2008 code adopted by the City of Austin aligns with the 2006 IECC and ASHRAE baselines. Changing baselines within the context of old goals can be challenging. Changing the baseline when goals are being reconsidered allows goals to be reset using the new assumptions which not only allows for better forecasting but for better reporting. With these reasons as support, the 2008 City of Austin Energy Code will serve as the new baseline.

Other known program changes that will affect future MW savings are the retirement of the 15+ year old radio-controlled thermostat program, effective FY2020. These currently comprise more than 40% of the thermostat demand response peak shavings program. Plans currently are underway to incentivize customers to the newer Wi-Fi-enabled thermostats. However, early years of transitioning will have

fewer thermostat program participants, with greater costs. Additional impacts will be noted later in the document.

Each of these known and predicted changes impacts and potentially lessens goal achievement. Additionally, as more focus is given to low income housing, greater budgets will be needed for less demand reduction savings overall. This ratio between DSM MW savings and the CES budget will need to increase if goals are to be attained. In other words, if Austin Energy is to continue to achieve ambitious DSM MW goals, rebate and marketing budgets will need to increase to reach customers not currently participating in programs. All of this must be viewed through the lens of Austin Energy's affordability goals (system average rate increases less than 2% per year and with rates in the lower 50% of utilities statewide).

Another market condition to address is returning program participants. While they meet the 10-year requirement, having participated previously and installing higher efficiency measures, the dwelling will not achieve the same level of savings as a home that did not have energy efficiency improvements installed previously. With Austin Energy providing these energy efficiency programs for over 30 years, repeat participants constitute a known impact of reducing potential future demand reduction savings.

The high rental population in the Austin Energy service territory creates a challenge for the rebate process. Multifamily dwellings comprise approximately 48% of the residential customer base. Within the single-family homes, the rental estimates are near 25% of homes. These numbers of rental properties can complicate the rebate process. The need for releases from owners and/or the interaction with owners not in Austin or Texas can negatively impact the successful program reach and savings potential. Moreover, the low vacancy rate in Austin and the surrounding areas reduce the incentive for property owners to participate in the program, often requiring 100% incentives to attract participation.

As demand reduction opportunities are reduced, it will take more resources to obtain more modest results. Staff augmentation also will need to be addressed. Programs such as low-income weatherization require more staffing than appliance efficiency or programmable thermostats. Along with program staff, additional marketing and outreach budgets/staffing may be required to effectively address the later stages of the adoption curve.

Assess Attainable Goals for 2025, 2027 and 2029

Following the above steps allows us to provide predictions of potential goals for 2025, 2027 and 2029. The models assume that all program sectors will contribute at the same proportion as the current state. This would mean that Demand Response would continue to contribute about 25% of the total. This would allow dispatchable DR to achieve 200 MW by 2025 for nearly all models and by 2027 for all models. No model was shown to achieve 300 MW in DR by 2027 or 2029. Due to maturing markets and current, proven technologies, it is not expected that demand response will see a major shift toward greater savings in the next 5 to 9 years.

The primary caveat for this methodology and report are the unknowns within the next five, seven and nine years as well as the direct relationship between megawatt savings and budget. Savings come at a cost. For example, there is a per year platform cost for the power partner thermostat (PPT) program regardless of the number of participants. This platform cost consists of a cloud-based service through which curtailment events are coordinated with participating customers. Regardless of the number of customers participating, the information technology costs remain the same. Basic economic principles predict that as markets become smaller and we move to the right side of the adoption curve, it will take more money to attract and retain energy efficiency participants.

Results

Customer Energy Solutions Analysis

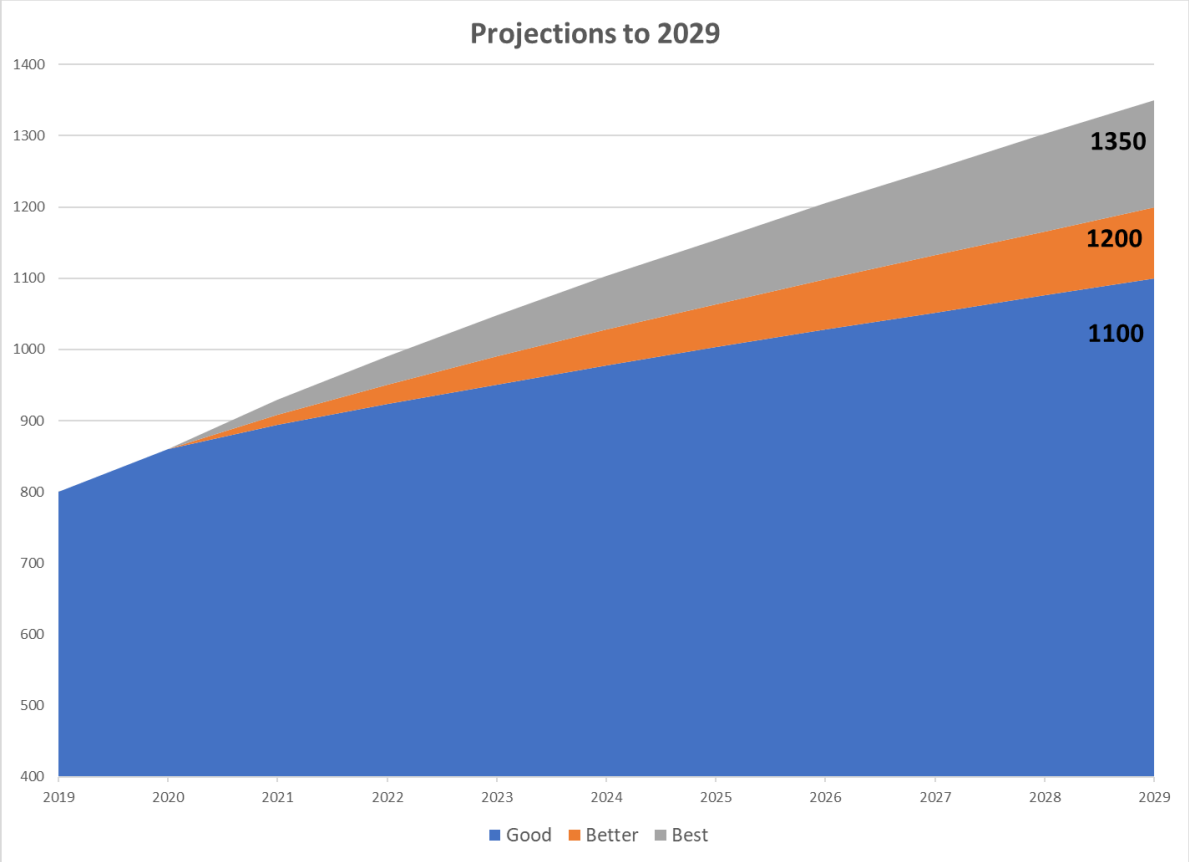
Customer Energy Solutions assessed the savings from the aspect of the two major program groupings – Energy Efficiency Services and Green Building program offerings. For each area, the teams took known parameters and estimated a trend going forward as well as the potential impact of Green Building codes and reduced the overall savings by the predicted proportion. FY2020 is the first year to show the impact of this change in MW savings prediction. MW savings goal for FY2019 were predicted to be 70 MW. Estimates for total MW savings for FY2019 are near 65 MW. The trend toward less savings each year is being realized in FY2019. The FY2020 savings are predicted to be lower at 61 MW. The decrease in growth is primarily a function of the first year of adjustments in energy code baselines from the year 2000 to 2008. Future reductions in the years to 2025 and beyond take into account additional market conditions and unforeseen program modifications. These modifications may be the inclusion of additional eligible participants, the sunsetting of programs not meeting the Total Resource Cost test, and future legislation that impacts rebate program delivery. A current review of savings from 2FY2007 through FY2018 can be found in the CES FY2018 Program Progress Report (https://austinenergy.com/wcm/connect/1a8638b1-da8f-4495-a834-c5ca426fed2d/CESFY18ProgramProgressReport.pdf?MOD=AJPERES&CVID=mAMGeO8).

While there may be some growth in the Green Building programs as a function of new construction in Austin, there is not expected to be the same level of MW reduction due to the more ambitious energy codes. A potential disrupter for the Green Building program could come from an adverse interpretation or ruling about TX House Bill 2439 (https://legiscan.com/TX/text/HB2439/id/1928074). In principle, the bill is intended to preclude codes from directing specific building materials in the construction of

buildings. It was crafted in response to cities in North Texas using codes to direct builders to use only brick on the exterior of buildings. The legislation as worded, however, is vague, so there is concern that future interpretation might impact participation in Green Building programs. Currently, approximately 30% of Green Building project participation is directed by geographic location, specifically, buildings located Downtown and within the North Burnet/Gateway zoning areas. Approximately 55% of projects are a result of development agreements for density trade-offs such as the Mueller community and other similar Planned Unit Developments (PUDs). Only 15% of projects are not a function of development agreements or location. If the result of a future clarification of the bill is that development agreements might not include code provisions, it could severely impact participation in the Green Building program. While this is not anticipated, as much as 85% of Green Building participation any given year is driven by zoning and agreements. Accounting for predicted and unknown program impacts will significantly reduce achievable DSM MW goals.

Similarly, staff expects to see reduced savings from rebate programs due to repeat participants, market conditions and a focus on lower income participation with reduced deemed savings per rebate dollar spent. Energy efficiency, while creating additional comfort and potentially increasing health benefits, does not often create significant energy savings. Based on recent Energy Information Agency (EIA) data, the average residential customer monthly energy use is 860 kwh, with the average use of low income customers not statistically different than non-low income customers. In fact, the average AE residential bill is the second lowest in the state due to the company's decades-long commitment to energy efficiency. As such, incremental reductions are smaller and come at a greater cost. Finally, changes to the thermostat program (transitioning to smart thermostats) will, in the near term, lessen available demand response during peak events.

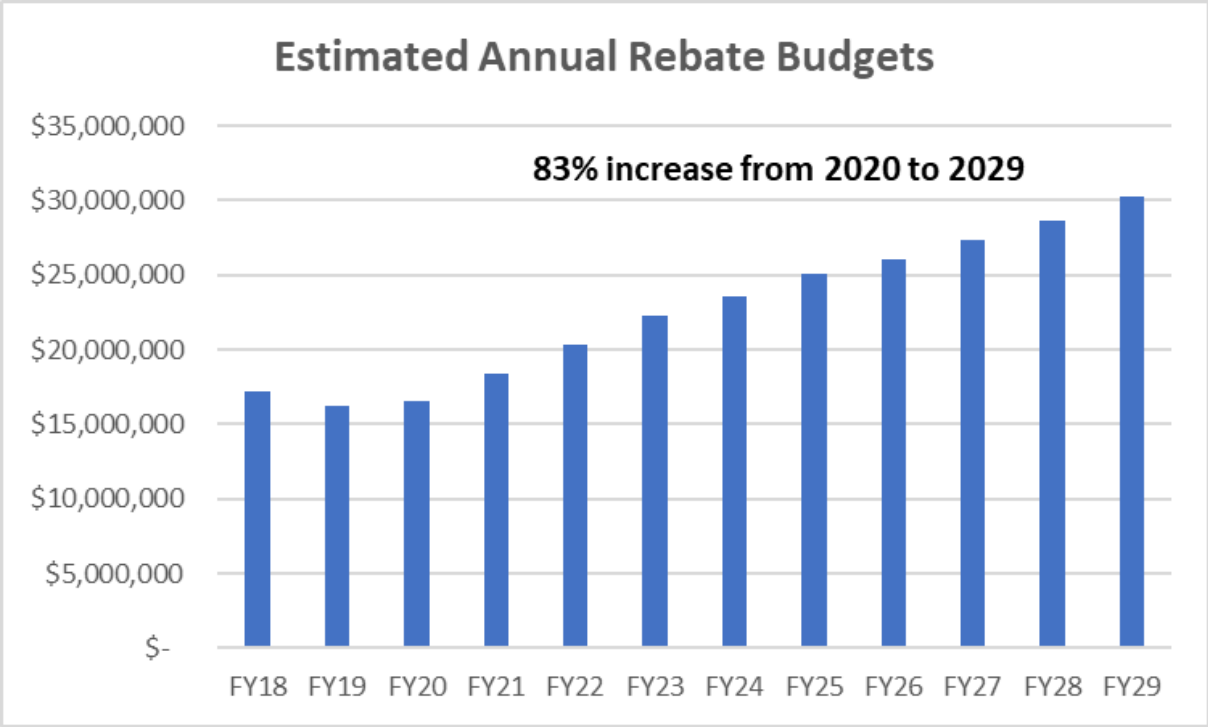
The graph below shows predicted projections for 2025, 2027 and 2029 in three scenarios of Good, Better and Best. "Good" is much like the Business as Usual estimates provided by the 2014 KEMA study where there was no change to program budgets or staffing. "Better" follows the 75% of Business as Usual as recommended by the 2014 KEMA study, indicating that an increase in budgets and staffing would result in greater savings over time. The final scenario, "Best", resemble the 100% Business as Usual prediction as laid out in the KEMA study. This scenario, while providing the greatest MW savings also comes at the greatest cost. The estimated CES MW savings forward to 2025, 2027 and 2029 are predicted to be 1100, 1200 and 1350, respectively. Note that these are modeled goals. These will most likely change and adjust with input from the DNV-GL benchmarking project currently underway.



Applying the 25% ratio in the CES analysis, demand response is still expected to yield 200 MW by 2025. This 200 MW is part of the total DSM MW to be achieved by 2025.

Appendix A provides the annual MW savings, rebate budget costs and additional staffing requirements for individual Customer Energy Solution programs. As can be seen for most of the programs, there is a stabilization of the MW savings, an increase in the rebate budgets and an increase in additional staff over time.

It is assumed that similar to the estimates found in the KEMA models, budgets would need to adjust upward to meet increasing demands for greater outreach for the underserved and hard-to-reach communities. The graph below shows that predicted budget will increase 83% between 2020 and 2029, based on anticipated needs to meet the above goals within a saturated and very mature market. These estimates are conservative by KEMA report measures. However, each analysis predicts the need for increased budgets to maintain ongoing MW savings achievement. Along with increased rebate budgets would come increased operations and maintenance budgets in terms of staffing and technology. Due to the maturity of programs, gaining a new set of program participants will take an investment in skills and tools to continually grow the programs, thus the DSM MW savings.



When looking at the CES analyses, the current estimates of the model along with the comparisons to the KEMA and AE Finance models, Austin Energy is expected to achieve the 900 MW goal by 2022. For 2027, analyses indicate that 1000 MW or greater can be achieved. For 2029, the goal could be set at 1100 or greater. It is recommended these estimates be used as placeholders, since the current study does not account for the variables that might impact the models, thus increasing the unpredictability of long-term goal setting. These remain predictions, dependent on budgets, resources, staffing and favorable market conditions. CES staff is committed to succeed at achieving the above goals.

APPENDIX A

Customer Energy Solution Programs – Individual Program Savings Estimation

The programs below comprise the majority of rebate program offerings and MW savings potential currently available for Austin Energy Customers. Each program provides the estimated savings as well as the needed rebate budget and increase in staff to achieve the MW savings. Programs not represented here include behavioral programs and those programs yet to be launched by Customer Energy Solutions.

RESIDENTIAL

Home Performance Benchmark Projections

	Projected MW Savings	*Rebate Budget Needed*	*Additional Staff Required*
FY20	1.30	$1,800,000	
FY21	1.34	$1,854,000	
FY22	1.38	$1,909,620	
FY23	1.42	$1,966,909	0.5
FY24	1.45	$2,006,247	
FY25	1.48	$2,046,372	
FY26	1.49	$2,066,835	0.5
FY27	1.51	$2,087,504	
FY28	1.51	$2,087,504	
FY29	1.51	$2,087,504	

Program Notes:

- AEP conversions will increase participation in HPWES
- Another tier of homes is being allowed and adapted under the program
- Strengthening Contractor relationships (i.e., increased training) will increase program capacity

AEP Benchmark Projections

	Projected MW Savings	*Rebate Budget Needed*	*Additional Staff Required*
FY20	2.60	$1,600,000	
FY21	2.68	$1,648,000	
FY22	2.76	$1,697,440	
FY23	2.81	$1,731,389	
FY24	2.87	$1,766,017	
FY25	2.93	$1,801,337	
FY26	2.96	$1,819,350	
FY27	2.99	$1,837,544	
FY28	2.99	$1,837,544	1.0
FY29	2.99	$1,837,544	

Program Notes:

- Exploring new technology deployments, such as smarter devices and "energy internet" components
- New measures being added

Direct Install & CAP Weatherization Assistance

	Projected MW Savings	*Rebate Budget Needed*	*Additional Staff Required*
FY20	0.72	$2,200,000	
FY21	0.72	$2,200,000	1.0
FY22	0.72	$2,200,000	
FY23	0.70	$2,200,000	
FY24	0.70	$2,200,000	
FY25	0.68	$2,200,000	1.0
FY26	0.68	$2,200,000	
FY27	0.65	$2,200,000	
FY28	0.65	$2,200,000	
FY29	0.63	$2,200,000	

Program Notes:

- Energy savings is low in this category and will be even lower for returning participants
- Much of the lower income programs will be directed to multifamily to support customers in those dwellings
- More staff is required to meet the outreach needs for the weatherization efforts

SPUR Benchmark Projections

	Projected MW Savings	*Rebate Budget Needed*	*Additional Staff Required*
FY20	1.75	$1,000,000	
FY21	3.00	$1,100,000	
FY22	3.30	$1,210,000	
FY23	3.63	$1,331,000	
FY24	3.99	$1,464,100	
FY25	4.99	$1,610,510	0.5
FY26	4.99	$1,610,510	
FY27	4.99	$1,610,510	
FY28	4.99	$1,610,510	
FY29	4.99	$1,610,510	

Program Notes:

- New contract that includes “mobile coupons” will increase the size of rebates as well as participation
- New products are being explored and added into the program

COMMERCIAL

These programs have been driven by lighting. With the proliferation of LED lamps, the low cost, quick payback projects are limited. As we migrate to more capital-intensive measures with longer paybacks, incentives take on greater importance, as does educating customers around depreciation of the assets, or tax credits they can leverage. Market transformation suggests future diminishing returns. Adding more service-related offerings such as HVAC tune ups, look appealing to offset some of the capital concerns.

Small Business Benchmark Projections

	Projected MW Savings	*Rebate Budget Needed*	*Additional Staff Required*
FY20	4.19	$2,260,170	
FY21	4.09	$2,246,890	
FY22	4.09	$2,349,020	
FY23	4.09	$2,430,730	
FY24	4.09	$2,451,150	0.5
FY25	4.09	$2,512,430	
FY26	4.09	$2,553,290	
FY27	4.09	$2,614,560	
FY28	4.09	$2,655,420	0.5
FY29	4.09	$2,757,550	

Commercial Rebates Benchmark Projections

	Projected MW Savings	*Rebate Budget Needed*	*Additional Staff Required*
FY20	8.98	$2,335,120	0.5
FY21	8.76	$3,064,430	
FY22	8.54	$3,628,070	0.5
FY23	8.32	$4,161,600	
FY24	8.12	$3,956,120	
FY25	7.91	$3,857,220	
FY26	7.71	$3,760,790	0.5
FY27	7.52	$3,666,770	
FY28	7.33	$3,575,100	
FY29	7.15	$3,485,720	0.5

MULTIFAMILY

In the over 20 years of existence, this program has served over 90,000 tenant units. We were experiencing program saturation with older more lucrative measures. Recently, we have revamped the program to include new programs and optimize old ones. This has reinvigorated the program. We expect the program to grow. However, occupancy rates are at an all-time high, making it less attractive for property managers to participate. This means investigating ways to engage with residents. The Multifamily program is historically hard-to-reach given the split incentive. We will continue to push to serve our customers despite these barriers.

MF Rebates Benchmark Projections

	Projected MW Savings	*Rebate Budget Needed*	*Additional Staff Required*
FY20	3.55	$2,012,500	
FY21	4.31	$2,443,750	
FY22	5.08	$2,875,000	
FY23	5.84	$3,306,250	1.0
FY24	6.60	$3,737,500	
FY25	7.36	$4,168,750	
FY26	7.36	$4,168,750	1.0
FY27	7.36	$4,168,750	
FY28	7.36	$4,168,750	
FY29	7.36	$4,168,750	

DEMAND RESPONSE

PPT Benchmark Projections

	Projected MW Savings	*Rebate Budget Needed*	*Additional Staff Required*
FY20	6.40	$700,094	
FY21	3.95	$727,817	1.0
FY22	3.59	$737,627	
FY23	3.04	$727,441	
FY24	2.33	$696,429	1.0
FY25	2.44	$731,250	
FY26	1.54	$677,482	
FY27	1.59	$697,806	
FY28	1.63	$718,741	
FY29	1.68	$740,303	

Program Notes:

- Two additional Power Partner vendors were added to program in FY19
- New technologies are being explored, including Auto DR and two-way communicating thermostats
- Coordinate Multifamily program to install more thermostats

Load Co-Op Benchmark Projections

	Projected MW Savings	*Rebate Budget Needed*	*Additional Staff Required*
FY20	1.87	$1,486,500	
FY21	1.93	$1,531,095	
FY22	1.98	$1,577,028	
FY23	2.04	$1,624,339	
FY24	2.10	$1,673,069	
FY25	2.17	$1,723,261	
FY26	2.23	$1,774,959	
FY27	2.30	$1,828,208	
FY28	2.37	$1,883,054	
FY29	2.44	$1,939,545	

Program Notes:

- Responds as an ERCOT program but serves more as a micro level program
- Assists with grid stability to provide more flexibility to Austin Energy directly
- Supports our load ratio share of transmission costs in ERCOT, price response, and mitigation around intermittent resources

ERS Benchmark Projections

	Projected MW Savings	*Rebate Budget Needed*	*Additional Staff Required*
FY20	16.00		
FY21	3.00		
FY22	6.00		
FY23	5.00		
FY24	4.00		
FY25	3.00		
FY26	2.00		
FY27	0.00		
FY28	0.00		
FY29	0.00		

Program Notes:

- Continue migration to more and more intermittent resources
- Robust resiliency to ensure grid stability.
- Requirement for a customer to bid in at least 1 MW
- Automation as the response times of 10 and 30 minutes

GREEN BUILDING

Information for Austin Energy Green Building includes the residential, commercial and multifamily programs for both energy codes and building ratings. The budget reflects operations, maintenance, rebates and marketing.

GREEN BUILDING Energy Codes and Ratings Benchmark Projections

	Projected MW Savings	*O&M/Rebate Budget Needed*	*Additional Staff Required*
FY20	28.20	$3,316,000	1.0
FY21	21.89	$3,813,400	1.0
FY22	21.99	$4,385,410	1.0
FY23	22.69	$5,043,222	1.0
FY24	23.65	$5,799,705	1.0
FY25	23.87	$6,669,660	1.0
FY26	24.14	$7,670,109	1.0
FY27	24.96	$8,820,626	1.0
FY28	24.91	$10,143,720	1.0
FY29	25.07	$11,665,278	1.0

Program Notes:

- Green Building numbers are highly dependent upon new construction rates for program performance. An economic downturn can dramatically impact construction for years. The result of the 2008 downturn saw Green Building participation drop over the ensuing two years as much as 75%. Unfortunately, recovery from such an event takes longer than the drop off, as program participation did not return to pre-2008 levels again until 2013. That said, program performance has tracked upward with the growth of the City.
- While changing the baseline code may negatively impact the claimed savings, square footage of space and number of homes/residences are the primary drivers of Green Building's costs, which are heavily dependent upon staff. The change in baseline will not impact the number and size of projects being rated.
- Residential, multifamily and commercial ratings projects are currently at all-time highs while staffing levels have remained fairly constant over the last 3-4 years. Current project load is at an unsustainable level for current staffing levels. Additional growth will require an increase of staff.
- It is anticipated that staffing levels and corresponding budgets for Green Building will need to increase by 15-20% annually to maintain current service levels and still provide new service offerings.

References

The following analyses were used to model the Aggregate Analysis. Using a combination of all accessible data and forecast models, the combined investigation was developed. Below are the individual analyses that support the combination found in the final aggregate results.

The KEMA Study

The KEMA study, conducted in 2012 and revised in 2014, indicated various levels of savings based on budgets committed to the energy efficiency programs. These predicted budgets included incentives, marketing and Operations & Maintenance (O&M). Higher savings are linked to greater spending. The table below is from the KEMA study. It shows the results of various models of savings. For this current analysis, the 75 Percent Incentives and 100 Percent Incentives were used in the final analysis.

Table 1-1
Summary of Cumulative DSM Potentials—2012–2020

	Base 2020 Forecast	Austin Energy Program Savings Forecast	DNV KEMA Potential Estimates					
					Achievable Potentials			
			Technical Potential	Economic Potential	BAU Flat Budget	BAU	75 Percent Incentives	100 Percent Incentives
Base 2020 Forecast (No DSM)	3,963							
Out-of-analysis AE Program Savings Forecast		236						
KEMA Base 2020 Forecast	3,727							
Residential Total	1,482	133	636	509	106	107	182	254
Commercial Total	1,477	162	349	276	94	97	146	189
Industrial Total	518		84	70	26	27	37	48
Other Total	250		0	0	0	0	0	0
All Sectors Total (EE)	3,727	295	956	744	226	231	366	492
Savings % of KEMA Base		7.9%	25.7%	20.0%	6.1%	6.2%	9.8%	13.2%
Savings % of Austin No-DSM Base		7.4%	24.1%	18.8%	5.7%	5.8%	9.2%	12.4%
Savings % of Economic Potential		40%			30%	31%	49%	66%
Total DSM (in and out of KEMA analysis)		531	1,192	980	462	467	602	727
Savings % of Austin No-DSM Base		13.4%	30.1%	24.7%	11.7%	11.8%	15.2%	18.4%

Notes: Base peak demand (no DSM) is Austin Energy's forecast assuming the absence of DSM programs. Out-of-analysis savings include Austin Energy's forecasted savings from load management programs and Austin's building codes. DNV KEMA's 2020 base forecast is net of the load management and code savings. The *All Sectors Total* (EE) row excludes the out-of-analysis savings, while the *Total DSM* row includes those savings (236 MW). The demand forecast includes 20 percent for transmission and distribution and spinning reserves.

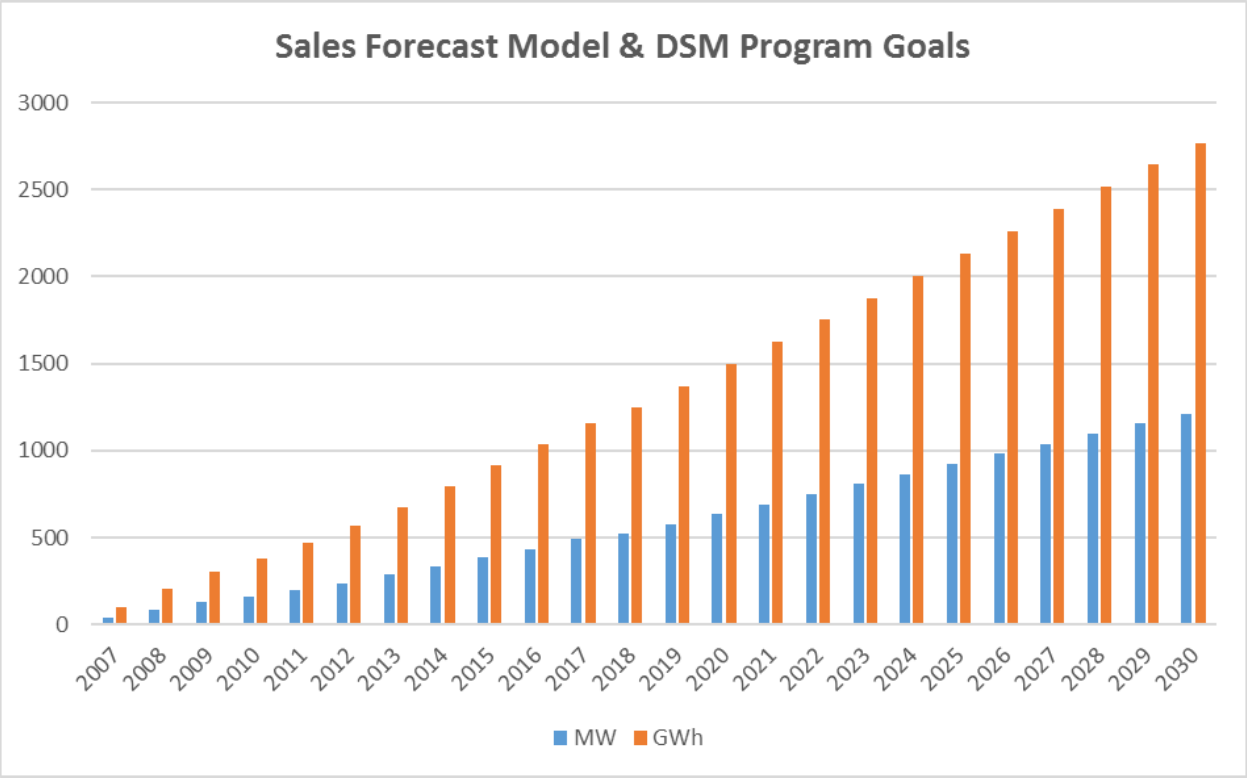
When comparing the KEMA study to CES actuals, the 100% Incentives analysis is closest to the actual savings, as predicted through 2020. Estimating these predicted savings forward to 2025, 2027 and 2029, the MW savings are predicted to be 982, 1084 and 1186, respectively. However, these are only estimates based on 2020 predictions.

As with any rebate program, budgets are a necessary support system for the success of savings achievement. The estimated KEMA budget is $1,015 Million from 2012 to 2020, at approximately $113 Million per year. Using this annual estimate, the budget to 2025 would be $1,581 Million. The budget to 2027 would be $1,807 Million. This is substantially higher than the current or planned spend within CES of $27 Million for rebates, marketing and O&M (as reported for FY2018).

Demand Response in the KEMA study, using the 25% prediction model, would achieve 200 MW by 2025. This 200 MW is part of the total MW to be achieved by 2025.

AE Finance Analysis

AE Finance assessed MW savings based on a ratio related to GWh sales. The growth model does not align with actuals reported in CES. Additionally, the tracking begins in 2003, 4 years before the goal start of 2007. The graph below adjusts for these first four years and starts tracking at 2007. Using the graph data below, Austin Energy's load forecast integrates the impact of DSM goals based on trend adjustments. While CES provided the source data, it does not align with actuals reported in CES. The tracking begins in 2003, 4 years before the goal start of 2007. The graph below adjusts for these first four years and starts tracking at 2007. Using an estimate of 58 MW per year as shown in the graph, both the energy and DR goals are achievable. This estimate does not take into account any possible market impacts or budget needs.



Estimating the AE Finance predicted savings forward to 2025, 2027 and 2029, the MW savings are predicted to be 924, 1039 and 1155, respectively. It is assumed that, similar to the KEMA model, budgets would need to adjust upward to meet increasing demands for greater outreach for the underserved and hard-to-reach communities. However, when performing studies on increasing the renewable goals, the increased budget was not considered.

Demand Response in the AE Finance model, using the 25% prediction model, would achieve 200 MW by 2025. This 200 MW is part of the total MW to be achieved by 2025.