Optimal ENERGY Integrated Energy Resources

CPS Energy Save For Tomorrow Energy Plan Phase 1 Review and Recommendations for Phase 2 ("FlexSTEP")

Summary Report

Prepared for

SIERRA CLUB
LONE STAR CHAPTER

by:

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INTRODUCTION

OVERVIEW OF SAVE FOR TOMORROW ENERGY PLAN (STEP)

More than a decade ago, the City of San Antonio and their municipal utility – CPS Energy – launched the Save for Tomorrow Energy Plan (STEP) energy conservation program. The program was in part the result of citizen pressure on city council and CPS Energy which had moved to both permit and construct a new coal-fired power plant (Spruce 2), and later explore expanding their investment in nuclear power. STEP was thus an effort to avoid the need for future supply-side resources by making a modest investment in demand-side and on-site generation resources. The initial plan established a goal of reducing overall electric demand by 771 megawatts between 2009 and 2020.

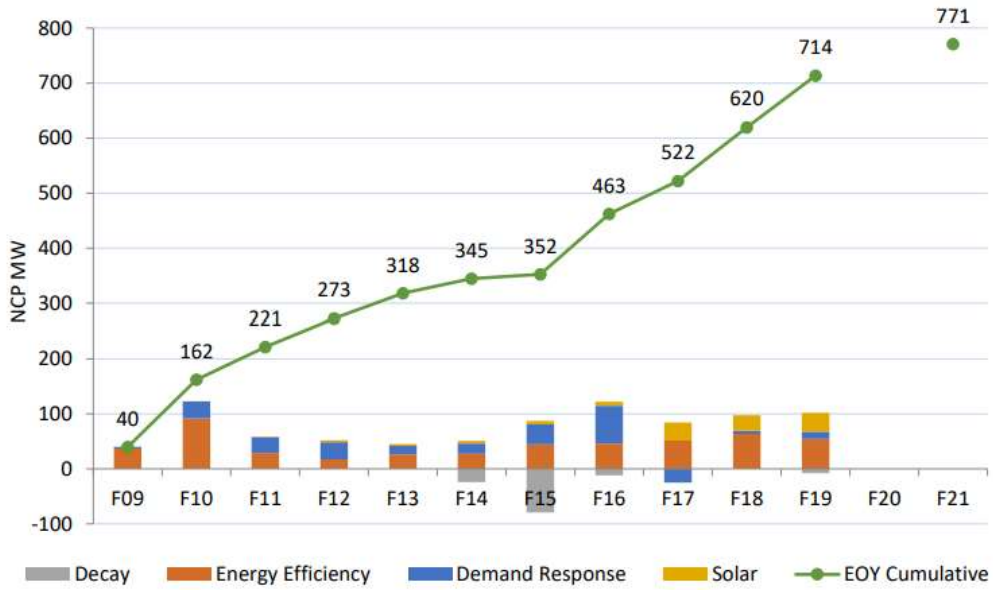

Figure 1. Cumulative Progress toward Meeting STEP Goal[2]

This plan has cut energy demand and overall energy use, saved customers money, reduced environmental impacts, and delayed the need for investment in additional generating capacity.[1] As of Fiscal Year 2019 (February 1, 2018 – January 31, 2019), CPS Energy was on track to meet this goal. At a recent presentation before the CPS Energy board in January, CPS Energy reported meeting the goal by achieving 825 MW of overall demand reduction since the advent of the program.[2] CPS Energy will soon be launching the next phase of their demand-side management (DSM) program.[3]

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[1] https://www.sanantonio.gov/sustainability/Environment/SaveForTomorow

[2] https://cpsenergy.com/content/dam/corporate/en/Documents/Trustees/BOT-Presentations/2020.01.14%20-%20STEP%20Bridge%20v2.pdf

[3] https://www.sanantonio.gov/Portals/0/Files/Sustainability/STEP/CPS-FY2019.pdf ; 2019 results to be published Summer 2020

COVERED IN THIS REPORT

This report will provide a high-level programmatic overview of the initial STEP program, costs, savings and results – broken out by sector and technologies. The report will then compare this performance and program offerings to other energy efficiency programs from other large municipal utilities. After providing this high-level review of past performance and benchmarking against peers - the remainder of the report will focus on recommendations for the future of STEP including:

- Goal setting for the subsequent 10-year DSM plan
  - Goal type
  - Numeric value
- The impacts of a stronger STEP plan/goal
  - Customer costs
  - Emissions reductions
- Programmatic enhancements
  - Existing programs
  - New potential program offerings

PROGRAMMATIC REVIEW AND PROGRESS TOWARDS 2020 GOAL

OVERALL PROGRAM TRENDS

The STEP program initially focused on traditional efficiency measures, but quickly expanded savings from demand response, and more recently – customer-sited solar. In the last several years, CPS Energy's portfolio has undergone dramatic shifts in where new savings are achieved.

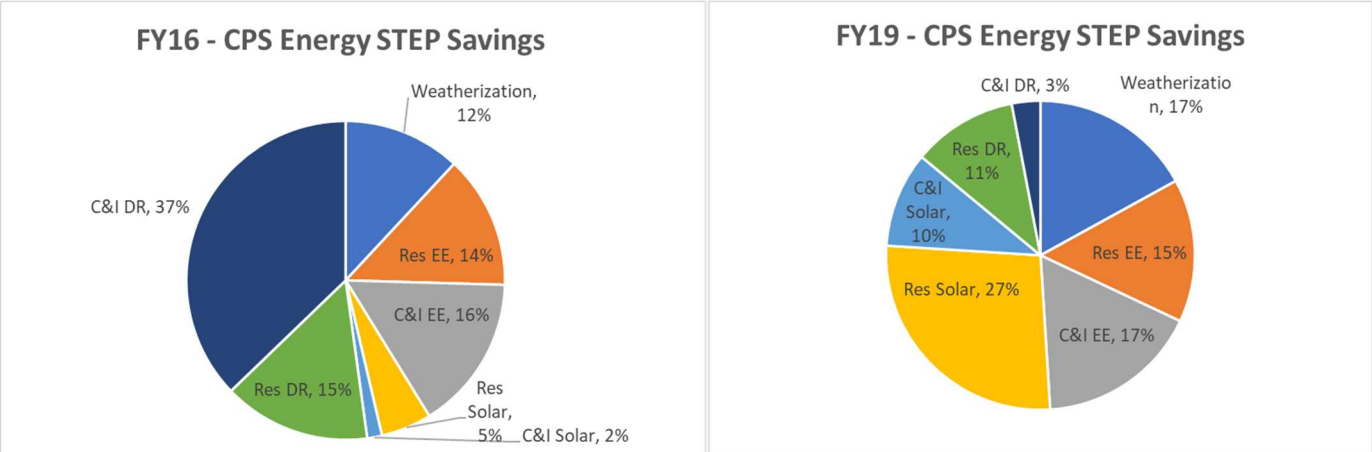

Figure 2. Percentage Breakdown of Savings Towards STEP goal for FY16 and FY19 [4,5]

In FY16, CPS Energy delivered ~111 MW towards their STEP goal, with the majority (52%) coming from Residential and Commercial demand response programs. Just a few years later in FY19, CPS Energy delivered ~94 MW towards their STEP goal, but with a much greater emphasis on solar and traditional efficiency program savings, with just ~14% coming from demand response. An important distinction on the goal of the STEP program is that the targeted savings goal is a reduction in net avoided non-coincident peak demand (measured in megawatts). Energy efficiency programs often target savings that are "coincident" with system-wide peak demand, or savings that occur during the highest demand periods. These savings are more valuable in reducing overall need for new generating capacity.

Specifically targeting non-coincident demand savings, that can occur at any time of day, is an uncommon approach to setting goals for energy efficiency programs, which will be addressed in a later part of this report. More common metrics used in energy efficiency goal setting are reductions in coincident peak demand (Austin Energy example in "Comparisons" section of report) or reductions in overall energy consumption (Los Angeles Department of Water and Power example in "Comparisons" section of report).

[4] https://www.sanantonio.gov/portals/0/files/sustainability/Environment/CPSFY2016.pdf
[5] https://www.sanantonio.gov/Portals/0/Files/Sustainability/STEP/CPS-FY2019.pdf

RESIDENTIAL & INCOME ELIGIBLE EFFICIENCY PROGRAMS

CPS Energy outsourced most residential programs to Franklin Energy in FY19, except for the internally managed Cool Roof program. Around half of all residential savings towards the STEP goal for FY19 came from the Residential HVAC program (47%), which provides rebates for high efficiency central air conditioners, heat pumps and window air conditioners. This program had the largest budget, delivered the most savings, and had the highest benefit-cost ratio of all residential programs. Focusing on cooling provides the greatest customer benefits (both cost savings and comfort improvements). The next largest program in terms of savings was the Residential Retail Partners initiative (17%), which offers in-store rebates for high efficiency lighting. CPS Energy offers several other programs which provide much lower savings (new home construction, home energy assessments, multifamily programs, etc.).

CPS Energy serves income-eligible customers through their Weatherization Program, which provides basic air sealing for walls, attics and floors, as well as insulation on HVAC and hot water distribution systems. This program also offers direct-install of LED light bulbs and low-flow showerheads and faucets. Most of these savings come from HVAC end-uses (84%), followed by LED lighting (14%), and hot water (2%).

COMMERCIAL AND INDUSTRIAL EFFICIENCY PROGRAMS

CPS Energy serves Commercial and Industrial (C&I) customers through a standard offering which covers lighting, HVAC and custom measures ("C&I Solutions"), as well as targeted programs for small businesses and for public/non-profits ("Schools & Institutions"). CPS Energy outsourced all C&I programs to CLEAResult in FY19.

Around half of all C&I savings came through the standard C&I program (47%), however, CPS also captured a respectable amount of savings through their Small Business Solutions offering (28%) and Whole Building Optimization (16%). Unlike Residential programs, the C&I portfolio is much more reliant on lighting savings than other end-uses. Not all C&I programs in CPS Energy's latest evaluation provide an end-use breakdown, however, it appears roughly 2/3 of all C&I savings comes from lighting.[6] This is fairly common for C&I programs, but is an area of growing concern for efficiency program administrators across the country. As the C&I lighting market, particularly linear florescent tube lighting, rapidly transitions to LED technologies – the availability of low-cost C&I savings will dwindle.

DEMAND RESPONSE PROGRAMS

Demand Response (DR) programs are designed to motivate customers to reduce electricity consumption during times of high market prices or when grid reliability is in jeopardy.[7] Rather than delivering savings by reducing overall consumption of electricity during some or all hours of the year via traditional efficiency measures, DR programs look to shift or reduce loads during specific, targeted times (typically mid-afternoon in the Summer, when AC and refrigeration use is highest).

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[6] https://www.sanantonio.gov/Portals/0/Files/Sustainability/STEP/CPS-FY2019.pdf

[7] https://www.energy.gov/oe/services/electricity-policy-coordination-and-implementation/state-and-regional-policy-assistanc-4

As part of CPS Energy's overall energy management programs for customers, DR offerings are available to both residential and commercial customer classes. Residential customers can participate using technologies such as smart thermostats or other load controls attached to air conditioning, electric water heaters or pool pumps. Commercial customers can participate by reducing electrical loads in a manner of their choosing, typically through temperature setbacks on cooling equipment or temporary shutdowns of industrial process equipment.

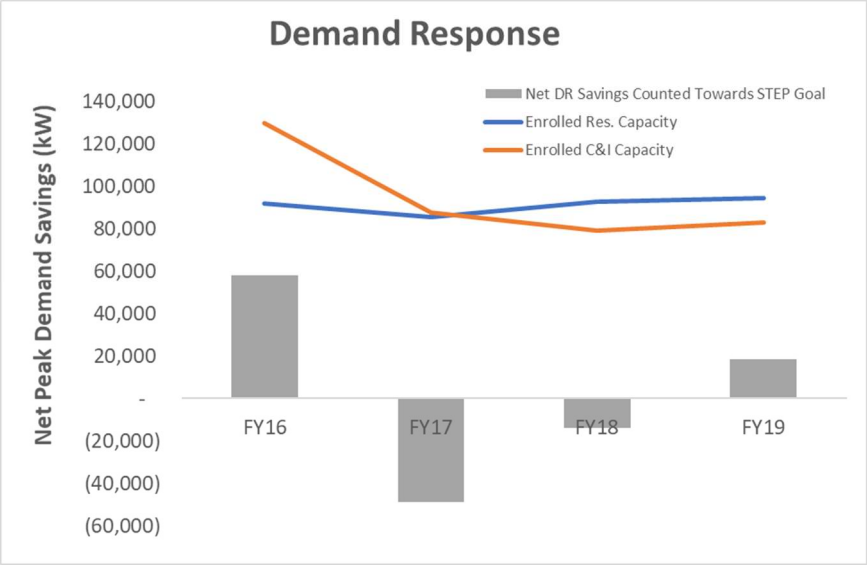

Figure 3. Residential and C&I Demand Response Savings (kW) FY16 – FY19

Over time, new STEP savings attributed to DR have contracted – particularly for commercial customers. Since only incremental DR savings are counted towards the STEP goal, any contraction year-over-year in total DR enrolled capacity is shown as a negative value (hence the negative shown in FY17). While CPS Energy does still have a reasonably strong DR portfolio, the overall share of new savings has declined over the past few years. In FY16, DR was over half of all new savings towards the STEP goal, but just a few years later in FY19 – this figure declined to just 14% of new savings in the portfolio. Note that maintaining the same amount of customer megawatts committed to DR programs has no net impact on overall performance towards the STEP goal.

SOLAR PROGRAMS

CPS Energy has offered solar energy rebates to Residential and Commercial/School customers for over 10 years. In that time, the price of solar photovoltaic panels has declined dramatically – allowing CPS Energy to offer progressively lower incentives, while still growing overall installed capacity in San Antonio. The price per installed watt for both Residential and Commercial systems has more than halved since 2009.

Figure 4, taken from the latest CPS Energy evaluation, shows the trends of solar installations and price over the 10-year STEP period for both Residential and non-residential customers. Note the difference in Y-axis showing that significantly more of the installed capacity

has come from the residential sector, and that the installed price and incentive for residential systems is higher than that of non-residential systems.

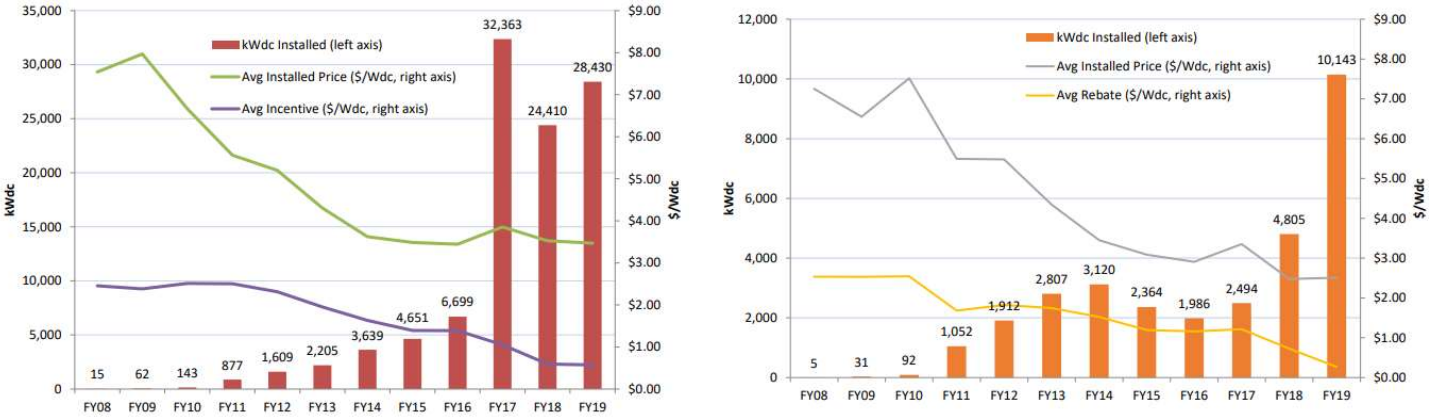

Figure 4. Installed Capacity, Price and Incentive Rates for Residential Solar Installations (left) and Commercial/School Solar Installations (right) from FY08-FY19

Residential installations peaked in 2017 at over 32 MW and have seen some modest declines over 2018-2019.[8] In FY17, the peak year for residential solar installed capacity, the average system size was 7.57 kilowatts and that customer received an effective incentive of approximately $1.05 per watt. In FY18 and FY19, the average incentives for residential systems were approximately $0.59/W and $0.57/W respectively, and while overall installed capacity was lower in each of these 2 years - CPS Energy delivered relatively consistent residential solar volume with ~40% reduction in incentive levels.[9,10,11] The average residential solar system size actually increased moderately during this time period.

In November of 2018, CPS Energy announced plans to change their solar incentive structure from a variable rate ($/W) to a flat rate of $2,500 per system for the first $9 million spent, at which point – the flat rate incentive drops to $1,500 per system. This plan was met with disappointment from the local solar installers community, who anticipated a decline in overall residential solar installations and that new systems would primarily be installed by more affluent households. [12] Preliminary results for the first three quarters of FY20 show that despite the decline in effective incentive levels, overall installed capacity growth for residential solar systems remains relatively stable. [13,14, 15] It is important to note that solar rebates issued in Q1 and Q2 of FY20 were still paid out at the higher $2,500 per system rate. The initial $9 million budget was not expended until the middle of Q3, at which point the lower $1,500 per system rate kicked in. Even so, CPS Energy saw an increase from 6,591 kW of new residential solar installed in Q2 to

[8] https://www.sanantonio.gov/Portals/0/Files/Sustainability/STEP/CPS-FY2019.pdf

[9] https://www.sanantonio.gov/portals/0/files/sustainability/step/CPSFY2017.pdf

[10] https://www.sanantonio.gov/Portals/0/Files/Sustainability/STEP/FY2018Annual.pdf

[11] Average inverter efficiency is 94-96%, so for purpose of high-level analysis difference between AC and DC is ignored

[12] https://www.bizjournals.com/sanantonio/news/2018/12/04/cps-energy-changes-solar-rebate-structure-cuts.html

[13] https://www.sanantonio.gov/Portals/0/Files/Sustainability/STEP/CPS-FY2020-Q1.pdf

[14] https://www.sanantonio.gov/Portals/0/Files/Sustainability/STEP/CPS-FY2020-Q2.pdf

[15] Q3 report provided by CPS Energy but not yet uploaded to City of San Antonio websites

8,720 kW in Q3. This is an encouraging sign that residential solar can continue to grow with lower rebate levels, partly due to declining costs. This is a trend that should be monitored continuously to ensure market growth persists.

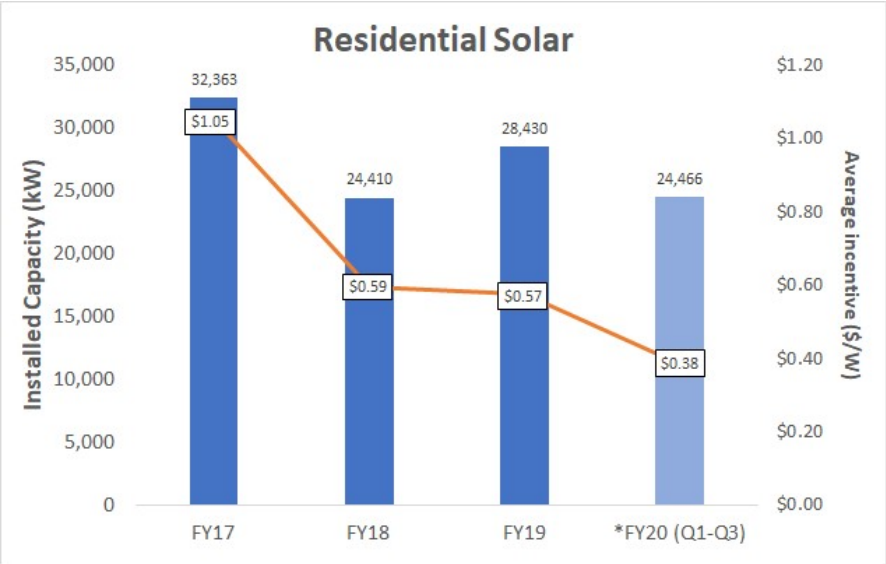

Figure 5. Residential Solar Installed Capacity (kW) and Average Incentive ($/W)

The Commercial/Schools solar program has already begun to see a dramatic decline in program activity in FY20, compared to FY19. CPS Energy set aside $1 million to fund commercial solar systems under the former variable rate structure, but as of Q3 FY20, commercial systems have already exceeded this threshold by over $400,000.

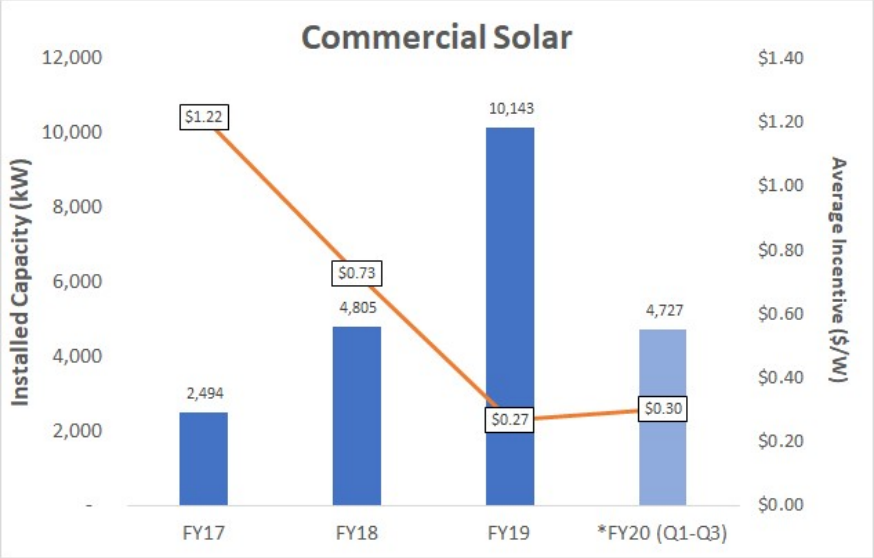

Figure 6. Commercial Solar Installed Capacity (kW) and Average Incentive ($/W)

Commercial systems are now only eligible for the same flat $1,500 per system rebate as residential systems. Moving forward – only very small commercial solar projects will materially

benefit from STEP solar rebates.[16] The average commercial project between FY17 – FY19 was 80 kW. Under the new flat rate of $1,500 per system, the same 80 kW system would receive an effective rebate of less than $0.02/W. As CPS Energy's FY19 evaluation showed, the price per watt of the average commercial solar installation in their territory was approximately $2.50/W, making a less than 2-cent rebate negligible. Given the dramatic decline in overall solar costs in the past decade, commercial systems may continue to grow in the absence of strong incentives, however, CPS incentives will have little impact on the proliferation of new capacity. These funds may be better expended on residential systems where the impact may drive new capacity.

[16] https://www.sanantonio.gov/Portals/0/Files/Sustainability/STEP/CPS-FY2020-Q2.pdf

COMPARISON OF PROGRAMS AND PERFORMANCE TO PEERS

Compared to many jurisdictions, CPS Energy's STEP program offers a relatively robust variety of demand side management (DSM) activities. A portfolio of traditional efficiency, demand response and solar programs is the type of integrated, holistic DSM plan that many program administrators and policy makers would be envious of. That said, municipal utilities such as CPS Energy have more control over what programs they run compared to traditional investor-owned utility companies regulated by state government. For the purpose of comparing CPS Energy to their peers, it is important to limit that comparison to utilities in similar regulatory environments. While CPS Energy and American Electric Power (AEP) are both located in Texas, and in fact neighbors, the rules that govern AEP and CPS Energy are significantly different enough to make such a comparison ineffective.

AUSTIN ENERGY

The closest comparison to CPS Energy is the municipal utility for nearby Austin, Texas – Austin Energy. Austin Energy is approximately half the size of CPS Energy in terms of customer count and electric sales, but both utilities are municipal utilities with some level of oversight from both the Mayor and City Councils of their respective cities. Austin City Council has a dedicated Austin Energy Utility Oversight Committee that meets monthly.[17] In San Antonio, City Council's Planning and Community Development committee provides limited oversight for CPS Energy – mostly addressing land use and utility infrastructure siting, with essentially no input on generation or efficiency programs.[18] In 2007, Austin City Council adopted the Austin Climate Protection Plan (ACPP). In 2010, the Austin City Council adopted a wider Austin Energy Generation Resource Plan. This plan and subsequent efforts adopted by the Austin City Council in 2014 and again in 2017 have led to the formation of several energy efficiency, renewable energy, and emissions reductions goals for Austin Energy. In fact, on March 9th, the Electric Utility Commission and Resource Management Commission recommended adoption of a new 2030 plan which includes a goal of 1,200 MW of demand reduction by 2030, 375 MW of local solar and a carbon-free utility by 2035. On March 26th, the Austin City Council adopted these new goals as part of the 2030 Austin Energy Resource Plan.

Austin Energy's goals are demand reductions of 900 MW by 2025 and 1,200 MW by 2030. These goals are more aggressive than CPS Energy's goal in multiple ways. To start, the raw amount of MW reduction is greater for Austin Energy's DSM plan than CPS Energy's 714 MW goal. However, these goals must be contextualized in two ways: first - how do these goals compare to each utility's peak electric demand, and second – what is the timeframe for each goal? At the time Austin Energy's 900 MW goal was set, their system-wide peak occurred in 2008 and was 2,514 MW (since increased to 2,755 MW in 2017); CPS Energy's system-wide peak occurred in 2010 and hit 4,738 MW. As a percentage of overall system peak demand, Austin Energy's DSM plan is more ambitious (35% savings compared to peak) than CPS Energy's DSM plan (15% savings compared to peak). Another factor that must be considered is the timeframe for each goal.

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[17] http://www.austintexas.gov/department/austin-energy-utility-oversight-committee

[18] https://www.sanantonio.gov/Council/Council-Committees#213331354-planning-and-community-development

Austin Energy's goal was originally set in 2008 with a target completion year of 2025 (17 years), compared to CPS Energy's STEP goal set in 2010 with a target completion year of 2020 (10 years). Accounting for these different time horizons, Austin's goal equates to 2.1% savings per year, compared to 1.5% savings per year in San Antonio – which again, makes Austin's program the more aggressive one.

Even more critical than the numeric differences between Austin Energy's DSM goal and CPS Energy's goal is the actual metrics used to evaluate success. Austin Energy's DSM goal is based on overall peak electricity demand savings and is composed of traditional energy efficiency programs and demand response programs. CPS Energy's goal also targets a reduction in demand, however, CPS Energy measures performance using non-coincident peak demand savings. While both goals target a reduction in demand measured in megawatts (MW), there is a very important distinction between these two metrics. One of the primary drivers for utility investment in new generating capacity are system-wide peak demands. When a utility's instantaneous demand for electricity exceeds overall available supply (or capacity within a confined distribution network) they risk overloading their system, which can cause rolling blackouts. Austin Energy's goal is specifically structured to target reductions in electric demand during those peak times, which in turn, reduces the need for investment in new generation. CPS Energy's STEP goal targets non-coincident peak demand savings, or– savings that can occur at any time of day. CPS Energy simply totals the amount of MW savings across all programs regardless of when those savings occur to arrive a total savings value. If the goal of a utility DSM program is to defer or eliminate the need for investment in new capacity, the savings pursued should be coincident with system-wide peak demands. This point will be returned to in the subsequent comparison to Los Angeles' municipal utility's DSM goal, as well as the recommendations and conclusions section to this paper.

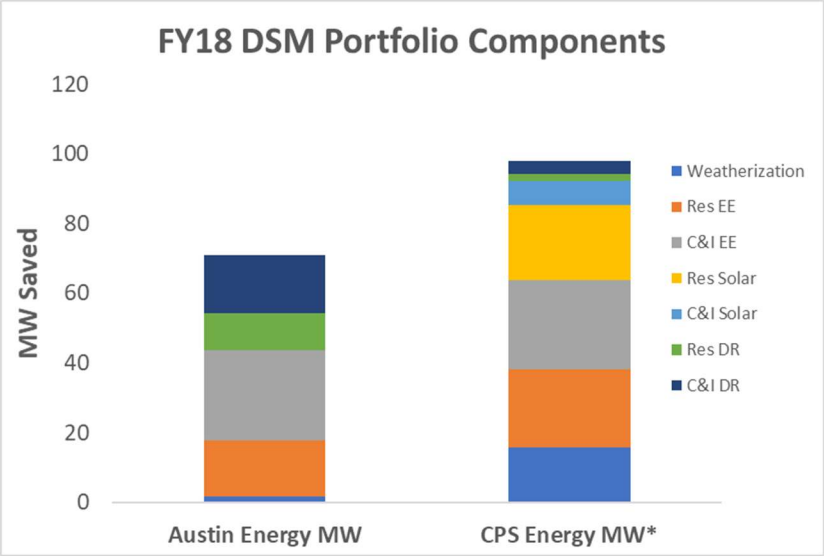

Figure 7. Composition of Austin Energy's DSM portfolio compared to CPS Energy[19]

[19] FY18 is the latest evaluated year for both utilities

In addition to this demand savings goal, it is important to note that in 2017 with the adoption of the 2027 Austin Energy Generation Resource Plan, Austin Energy also made a commitment to save at least one percent of energy every year from their DSM programs. In addition to the long-term DSM goal of 900 MW, Austin Energy committed that those programs would also reduce overall energy use. By contrast, CPS Energy has no specific energy usage savings commitment.

Several differences are apparent when looking at the components of Austin Energy's program savings, compared to CPS Energy. First, CPS Energy delivered 38% more demand savings in FY18 than Austin Energy - although it is important to remember that CPS Energy is approximately double the size of Austin Energy. Second, Austin Energy's DSM portfolio does not contain any solar. Third, weatherization plays a much larger role in CPS Energy's portfolio and DR plays a much larger role in Austin Energy's portfolio.

While Austin Energy does not count solar in their DSM portfolio, they do still offer rebates and incentives for solar as part of their broader program offerings and have a separate goal of installing 200 MW of local solar capacity by 2025 and 375 MW of solar by 2030.[20] Solar programs in Austin and San Antonio have some basic similarities: both utilities have recently converted their solar programs from a variable to fixed rate for residential customers ($2500 per system).[21] Commercial systems, however, receive different treatment in Austin. As noted, CPS Energy's initial funding for commercial solar systems – where customers could still receive a higher, variable incentive rate on a dollar per installed watt basis for their systems – has been exhausted. New commercial solar systems in CPS Energy service territory will now receive the same flat $2500 per system rebate. Perhaps acknowledging that such a small incentive level would be inadequate to influence commercial customer decisions, Austin Energy does not offer any up-front rebates for commercial solar, although they do offer a modest 3-tiered Performance-Based Incentive – which declines based on overall project size.[22]

Another apparent difference in these utilities' treatment of solar is the rate at which customers are compensated for excess solar sold back into the grid. Austin Energy has a dedicated webpage that clearly states the Value of Solar (VoS) rate applied to all electricity generated by customer solar systems. This rate was developed based on research conducted by Clean Power Research, and from January 1, 2018 until the next rate review in 2021 – residential and small commercial solar customers will receive 9.7 cents per kilowatt hour [23, 24]. Larger commercial systems under 1 megawatt in capacity receive 6.7 cents per kilowatt hour, and systems above 1 megawatt receive 4.7 cents per kilowatt hour. These rates send a clear signal to potential solar customers and developers, which they can use to model economic decisions. CPS Energy, on the other hand, has less clear guidance on solar rates.[25] A relatively outdated Solar Billing Factsheet

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[20] https://austinenergy.com/wcm/connect/6dd1c1c7-77e4-43e4-8789-838eb9f0790d/2027+Austin+Energy+Resource+Plan+20171002.pdf?MOD=AJPERES&CVID=lXv4zHS

[21] https://austinenergy.com/ae/green-power/solar-solutions/for-your-home/solar-photovoltaic-rebates-incentives

[22] https://austinenergy.com/ae/green-power/solar-solutions/current-solar-incentive-levels

[23] http://www.cleanpower.com/wp-content/uploads/090_DesigningAustinEnergysSolarTariff.pdf

[24] https://austinenergy.com/ae/rates/residential-rates/value-of-solar-rate

[25] https://www.cpsenergy.com/en/my-home/savenow/rebates-rebate/solar-photovoltaic-rebate.html

shows that CPS allows customers to count their solar generation against their total monthly consumption, and customers are only billed for their consumption above what their solar system produces.[26] If a customer generates more electricity than they consume in any given monthly billing cycle, they can sell their excess power back to the grid at a significantly lower rate of 1.6-2.0 cents per kilowatt hour depending on the time of year.[27]

Another major difference between Austin Energy and CPS Energy's DSM programs is the much greater percentage of savings coming from weatherization programs for CPS Energy. Weatherization programs provide attic/wall insulation, LED lighting, programmable thermostats, and other free energy savings upgrades to income qualifying households. It is not immediately clear why CPS Energy delivers much greater savings from weatherization programs than Austin Energy does, however, there are several possible reasons worth considering. For one, San Antonio has the highest percentage of people living in poverty of any metropolitan area in the United States (15.4% or 381,584 residents).[28] In the same year, the percentage of people living in poverty in Austin was 11.2%, and with the much smaller population – that equates to a little over 100,000 residents. The discrepancy could also be attributed to CPS Energy's goal being reported in non-coincident peak demand savings. If CPS Energy's DSM portfolio focused on true peak demand savings, reported savings from weatherization programs would be about 35% lower than what was counted towards the STEP goal.

Austin Energy's DR program for C&I customers saw a 35% increase in enrollment for their latest fiscal year reported. This was largely driven by the addition of 87 accounts from Austin area school districts and 5 accounts from City of Austin public buildings. Together, these 92 accounts provided most of the year-over-year increase in commercial DR savings (117 new accounts added overall). Austin Energy also saw a significant increase in residential customers enrolled in DR programs utilizing smart thermostats. Austin Energy does not publish an annual evaluation report of their programs like that of CPS Energy, making it difficult to compare enrollment over multiple years. CPS Energy's reports have shown a slight leveling off in overall DR enrollment for both single family and multifamily program participants over the last several years. Since only the new incremental DR savings is counted towards goals, it is possible that Austin Energy is simply behind in market saturation for DR program participation compared to CPS Energy.

Finally, while not directly related to Austin Energy and CPS Energy's respective DSM portfolios, Austin Energy has invested significantly more electric vehicle charging infrastructure. Both utilities acknowledge the critical role electric vehicles play in decarbonizing the transportation sector. As of their FY18 report, Austin Energy managed over 750 level 2 EV charging stations.[29] While CPS Energy does not specifically report the number of level 2 stations,

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[26] https://www.cpsenergy.com/content/dam/corporate/en/Documents/EnergyEfficiency/solar_billing_facts.pdf

[27] Interview with CPS Energy staff – 1/29/2020

[28] https://therivardreport.com/census-data-san-antonio-regions-poverty-rate-rises-tops-nation/

[29] https://austinenergy.com/wcm/connect/1a8638b1-da8f-4495-a834-c5ca426fed2d/CESFY18ProgramProgressReport.pdf?MOD=AJPERES&CVID=mAMGeO8

their EV FAQs state that there are about 150 public charging ports at CPS Energy's charging stations.[30]

LOS ANGELES DEPARTMENT OF WATER AND POWER

While not as comparable to the nearby example of Austin Energy, it is worth exploring efficiency goals of another large municipal utility in a warm climate: Los Angeles Department of Water and Power (LADWP). LADWP serves over twice as many customers as CPS Energy, however, their overall electric sales are smaller. This can largely be attributed to the higher concentration of residential electric customers in LA, compared to San Antonio (LA has more than double the population). LADWP has multiple DSM goals, however, their primary goal is to reduce overall electricity usage 15% by 2027. This goal differs from both CPS Energy and Austin Energy's goal in that it is an energy consumption reduction goal, measured in megawatt hours, rather than an energy demand reduction goal, measured in megawatts. Demand is a measure of power, and peak demand for a given utility occurs during the single hour when grid-wide need for electricity is highest. As previously noted, the need for new, marginal power plants is heavily driven by increases to peak demands.

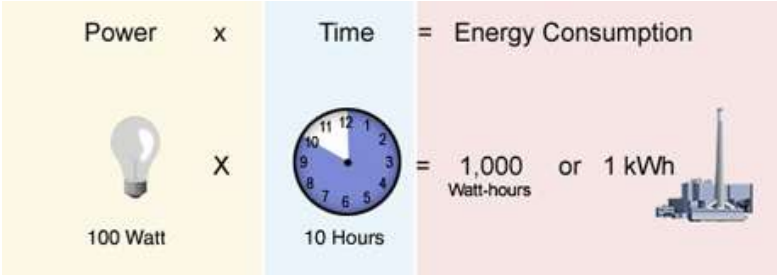

Figure 8. Energy demand (aka power) versus energy consumption[31]

LADWP has a separate goal to reduce peak demands by 500 MW by 2026 through demand response, but their primary energy efficiency goal targets energy consumption savings. By focusing on consumption, LADWP can cost-effectively pursue measures that provide significant customer savings, but little to no peak demand reductions - like LED streetlighting. Efficiency measures that target consumption may also deliver savings during periods when renewable resources like solar are not available and the grid is more reliant on dirtier fossil fuel plants for base-load power.

While CPS Energy's DSM goal is expressed in non-coincident peak demand reductions, their evaluation reports provide data on overall electric consumption reductions associated with their efficiency program activities. This data, along with CPS Energy electric sales data from 2010 (when the STEP program began) can be used to reconstruct CPS Energy's equivalent performance in terms of consumption reductions. Figure 9 compares CPS Energy's incremental annual energy efficiency savings performance to LADWP and the national average for DSM programs as

[30] https://www.cpsenergy.com/content/corporate/en/about-us/programs-services/electric-vehicles/ev-faq-terms.html

[31] http://c03.apogee.net/mvc/home/hes/land/el?utilityname=horryelectric&spc=ud&id=2483

reported by the American Council for an Energy Efficient Economy in their 2017 Utility Energy Efficiency Scorecard.[32]

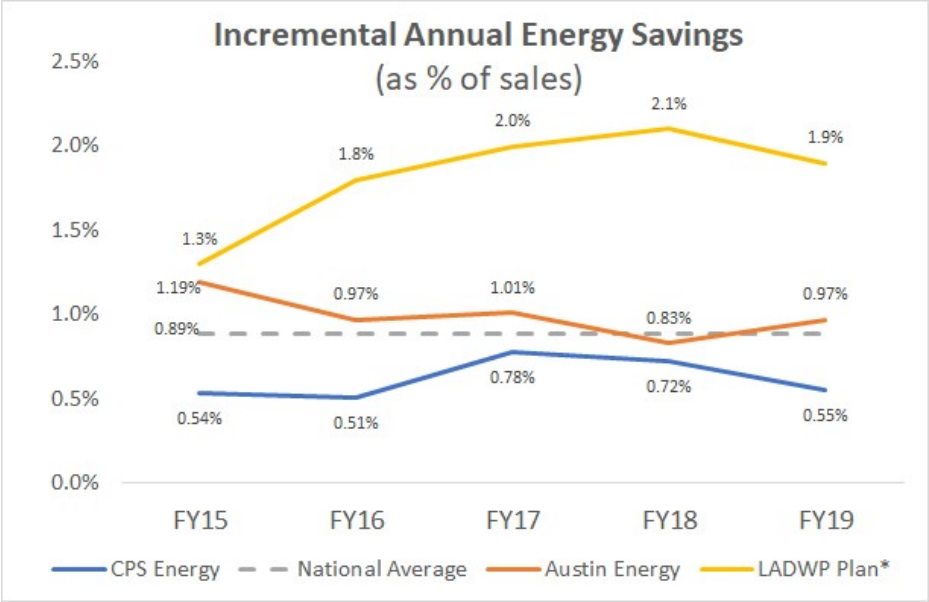

Figure 9. Comparison of CPS Energy, Austin Energy, LADWP and National Average Incremental Annual Energy Consumption Savings [33, 34, 35, 36][37]

CPS Energy's energy efficiency savings is below the national average for utility DSM programs and well below LADWP's planned performance. The STEP program was designed to deliver non-coincident peak demand savings and there is no way of knowing how a different target would have impacted CPS Energy program decision making in retrospect. This comparison also excludes CPS Energy's solar energy achievements. Still, comparing their energy efficiency performance in a more commonly used framework helps contextualize where improvements could be made in the future.

COMPARISONS SUMMARY

These comparisons are not intended to promote one type of DSM goal over another, but rather to show that there are different ways to think about DSM goals. If the objective is to reduce the need for new power plants, a DSM plan should target coincident peak demand savings. If the objective is to reduce overall energy use, a DSM plan should target energy consumption savings. Some DSM plans have direct greenhouse gas emissions reduction goals, and comprehensive plans have multiple targets that address multiple policy objectives. One conclusion that should

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[32] https://www.aceee.org/research-report/u1707

[33] https://cpsenergy.com/content/dam/corporate/en/Documents/Finance/2012_CPSEnergy_Annual_Report.pdf

[34] https://www.sanantonio.gov/sustainability/Environment/SaveForTomorrowReports

[35] ACEEE 2017 Utility Efficiency Scorecard

[36] https://www.ladwp.com/cs/idcplg?IdcService=GET_FILE&dDocName=OPLADWP047230&RevisionSelectionMethod=LatestReleased ; LADWP evaluation documents were unavailable to show actual performance, however their 2018/2019 briefing book states that they achieved their goal ahead of schedule – so actual performance was higher than shown in the graph above.

[37] https://data.austintexas.gov/Utilities-and-City-Services/Energy-Efficiency-Energy-Savings-MWH-/puti-m48v/data

be drawn from these comparisons is that a non-coincident peak demand goal, such as the one adopted in the first phase of the STEP program, is not the best way to provide customer benefits or reduced environmental impact.

	CPS Energy [38, 39]	Austin Energy [40, 41, 42]	Los Angeles DWP [43, 44, 45]
Electric customers	**840,750**	**485,204**	**1,500,000**
Electric sales	**31,340 GWh**	**13,410 GWh**	**22,269 GWh**
Peak demand	**4,738 MW**	**2,514 MW**	**6,502 MW**
Demand-Side Management and Renewable Energy Goals	• 771 MW in non-coincident peak demand savings by 2020 (1.5% per year)	• 1,200 MW in peak demand savings by 2030 (2.1% per year) • Additional 1% annual energy savings goal (measured in MWh) • 65% renewable by 2027 • 375 MW local solar by 2030 • 20% CO2 reduction by 2020 and 100% by 2035.	• 3,600 GWh in energy savings by 2027 (1.5% per year) • 500 MW of Demand response by 2026 • 100% carbon neutral by 2045 (CA state law)

38 https://www.cpsenergy.com/content/dam/corporate/en/Documents/Annual%20Report%202018-19.pdf

39 https://www.cpsenergy.com/content/dam/corporate/en/Documents/Sustainability_Report_2010.pdf; Based on August 23, 2010 peak demand of 4,738MW over 10 years from 2010-2020. *note – CPS goal is based on non-coincident peak demand reductions

40 https://austinenergy.com/ae/about/company-profile/numbers

41 https://austinenergy.com/ae/about/reports-and-data-library/customer-energy-solutions-program-updates

42 https://data.austintexas.gov/Utilities-and-City-Services/Austin-Energy-System-Peak-Demand/a6pm-qynf; based on FY08 peak demand of 2,514 MW over 17 years from 2008-2025

43 https://www.ladwp.com/ladwp/faces/ladwp/aboutus/a-power/a-p-factandfigures?_adf.ctrl-state=s0kxhtu9c_126&_afrLoop=311304745618758

44 https://www.ladwp.com/cs/idcplg?IdcService=GET_FILE&dDocName=OPLADWPCCB629209&RevisionSelectionMethod=LatestReleased; based on 15% goal from 2010-2020, recommitted additional 15% for 2017-2027 based on program success

45 http://rates.ladwp.com/Admin/Uploads/Load%20Forecast/2017/10/2017%20Retails%20Sales%20Forecast_Final.pdf

PLANNING AHEAD FOR 2030 GOAL

GOAL SETTING

When setting energy efficiency/demand-side management goals, it is important to first consider the structure and metrics of a goal, and then determine a reasonable numeric value for the selected goal-type. The original STEP goal targeted non-coincident peak demand savings, which is a suboptimal way to provide societal benefits (environmental or economic). Programs typically target coincident peak demand reductions to help mitigate the need for new utility infrastructure (Austin Energy example) and energy consumption reductions to reduce environmental impacts (LADWP example). The most comprehensive programs have several goals including demand and consumption reduction goals, as well as direct greenhouse gas emissions reduction goals.[46] As a natural gas utility, CPS Energy should also adopt an efficiency goal for that side of their business.

In terms of identifying an aggressive, yet still reasonably achievable, numeric goal – industry standard practice is to conduct an energy efficiency and demand savings potential study. According to CPS Energy staff, a potential study was conducted by Nexant before the original STEP goal was set.[47] Given this study was conducted a decade ago, a logical next step would be to conduct an updated potential study for CPS Energy service territory for the next 10 year phase of the program. Many efficiency technologies that were relatively new at that time (LED lighting, building controls/automation, heat pumps, battery storage, etc.) are now commercially available and offer much greater levels of cost-effective energy savings. CPS Energy has requested a one-year bridge to the original STEP program funding, which would allow them to continue running programs until January 31, 2021.[48] Including the time required to draft and issue a request for proposal, execute a contract with a firm and conduct the study – it is feasible that CPS Energy could complete a potential study and have results by the end of 2020 which could feed into their goal setting for the next 10 year phase of the STEP program.

RECOMMENDATIONS AND CONCLUSIONS

- ***Non-coincident peak savings*** delivers no specific customer, societal or environmental benefits.
- Energy efficiency goals are typically set based on independently conducted energy efficiency potential studies and reviewed by impartial third parties. CPS Energy should conduct such a third-party study within six months based upon well-established best-industry practices.
- Goals for FlexSTEP should be comprehensive by targeting electric and natural gas savings (kWh and MMBtus), coincident peak demand savings (kW) and carbon reductions.

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[46] http://ma-eeac.org/wordpress/wp-content/uploads/Term-Sheet-10-19-18-Final.pdf

[47] Interview with CPS Energy staff – 1/29/2020

[48] https://cpsenergy.com/content/dam/corporate/en/Documents/Trustees/BOT-Presentations/2020.01.14%20-%20STEP%20Bridge%20v2.pdf

- CPS Energy should commit to the following achievable goals -
    - 1.5 percent annual electric savings (measured in MWh)
    - 0.8 percent annual gas savings (measured in MMBtus)
    - 940 MW of coincident peak savings of over 10 years
    - 1.8 million metric tons CO2 saving over 10 years
- FlexSTEP should not abandon traditional EE programs, including weatherization; these measures are proven to save customers money, reduce peak electricity demands and defer the need for additional investments in new capacity.
- CPS Energy recently instituted a change to their residential solar rebate structure. As of the latest report (Q3 2020), this has not had an adverse impact on residential solar installations. All parties should continue to monitor residential solar installation data to ensure these rebates still drive healthy growth in that market.
- Consider either enhancing upfront rebates for C&I solar or end them altogether since current rebates are too low to influence customer decisions.
- Make the solar rate structure more transparent by exploring current net-metering policies and looking at other options for both residential and commercial customers.
- Expand support for programs like the SolarHostSA program and the Big Sun Community Solar program and explore additional community solar programs that are available and accessible to those with limited incomes
- Invest in additional control of customer assets and/or energy storage systems (stationary batteries, EVs and thermal storage) as a new source of demand response service.
- Form a City Council committee dedicated to CPS Energy issues like Austin has for their municipal utility; CPS issues currently are only considered as part of a broader planning committee that merely addresses association land use and utility infrastructure.

IMPACTS OF A STRONGER STEP PROGRAM

Utility efficiency programs in mature markets currently achieve higher savings rates than CPS Energy is achieving. When evaluating goals, it is important to understand the associated costs and benefits. A common mistake is to look at rate impacts from energy efficiency charges in isolation from the reduced energy use that results. Rather we should focus on average bill impacts, which is what customers are interested in. Utilities achieving higher savings spend more on energy efficiency per capita, but these cost-effective investments result in lower average energy bills for customers.

San Antonio's recently approved Climate Action and Adaptation Plan has an aggressive goal of carbon neutrality by 2050. This requires bold action. A stronger FlexSTEP will contribute toward reaching that goal. The efficiency goals outlined above represent a potential 11 percent reduction in the City's GHG emissions by 2030.