

Electric Utility Commission Resource Planning Working Group 2016-17 Recommendations for Resource Planning Update

The Electric Utility Commission Resource Planning Working Group (Working Group) 2016-2017 worked in collaboration with Austin Energy to update the Austin Energy Resource, Generation and Climate Protection Plan to 2025. Resource planning is intended to be a roadmap that is designed to meet affordability and climate protection goals approved by the Austin City Council. The current update addresses resource plan options through 2027.

The previous update of the plan to 2025 included a statement, which the Working Group supports, regarding the purpose and intent of updating resource plan goals. “The recommendations are designed to be flexible and dynamic. As the circumstances change, the City and Austin Energy will maintain flexibility to modify elements to respond to a range of factors, including economic conditions, customer load, fuel prices and power supply availability, infrastructure build-out, technological development, law and regulations, policy direction, rate structures and customer needs. Therefore, the Plan will need to be adapted and modified to manage risk, maintain system and service reliability, achieve policy goals and meet customer demand for excellence in all aspects of service. As each significant implementation step is undertaken, Austin Energy’s recommendations to the City Council must be supported by assessment of impacts on all customers and by charting the progress each step will make toward achieving the goals outlined in this Plan.”

Austin Energy should receive prior City Council approval before pursuing any significant deviations from the plan. This will allow for a transparent public process, as well as flexibility.

The 2016-2017 Electric Utility Commission Resource Planning Working Group included members who represented business, customer, low-income consumer, environmental interests and City Commissioners. Members were:

- Karen Hadden, Chair
- Bob Batlan
- Janee Briesemeister
- Carlos Castanada
- Todd Davey
- Leo Dielmann
- Betty Dunkerley
- Cary Ferchill
- Richard Halpin
- Brent Heidebrecht
- Rebecca Melancon
- Michael Osborne
- Cyrus Reed
- Paul Robbins
- Susanne Vaughan
- Kaiba White

Khalil Shalabi, VP Strategy, Technology and Markets represented Austin Energy Staff at the meetings. Sathibabu “Babu” Chakka and Erika Bierschbach provided technical support from Austin’s Energy & Market Operations team. Brent Heidebrecht and Carlos Castaneda resigned from the working group before the process ended.

The working group chose to abide by Open Meeting Act rules, publicly announcing meetings and inviting citizen input. Thirteen meetings were held between November 2016 and May 2017:

- Nov. 7, 2016,
- Nov. 29, 2016,
- Dec. 6, 2016,
- Dec. 14, 2016,
- Jan. 10, 2017,
- Jan. 24, 2017,
- Feb. 7, 2017,
- Feb. 28, 2017,
- April 3, 2017,
- April 20, 2017
- May 9, 2017.
- May 16th 2017
- May 30, 2017

Progress Toward Current Goals

Austin Energy provided updated information on the progress made toward previous goals. This slide summarizes the goals and directives from the 2014 Austin Energy Resource Plan Update and progress made toward the goals. Austin Energy must continue working to meet all environmental policies set forth by the City Council, as well as stated affordability and competitiveness goals. In addition to the goals below, the goal of reducing carbon emissions from Austin Energy-controlled resources to zero by 2030 will be important in the next update of this plan.

Recap of Goals & Directives from 2014 Update



- 2014 Austin Energy Resource Plan (Progress to date)
 - 55% renewables by 2025 (30%)
 - 900 MW Demand Side Management by 2025 (576MW)
 - 700 MW energy efficiency by 2020
 - Demand Response
 - 100 MW by 2020 and additional 100 MW by 2025 (54MW)
 - 950 MW solar by 2025
 - 110 MW Local Solar by 2020 and additional 90 MW by 2025 if affordable (74 MW)
 - 750 MW Utility Scale Solar by 2025
 - 275.5 MWs Operational with E. Pecos (Bootleg) of 118 MW Commercial on 4/5/2017
 - 320 MW under contract
 - CO2 emissions
 - 20% reduction from 2005 levels by 2020 (Meeting)
 - Retirement of Fayette Coal Plant beginning in 2023 (in progress)
 - Affordability
 - 2% limit per year (met)
 - Rates should be in the lower 50th percentile statewide (slightly above trending lower)
 - 10 MW (lithium ion batteries) local storage by 2025 + 20 MW of thermal storage (17MW Thermal/3 MWe in progress)
 - Retire Decker steam units by 2019 and replace with 500 MW efficient combined-cycle (pending) – subject to a third party study (complete)

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Modeling Scenarios:

The group recommended various scenarios to be analyzed by Austin Energy. The utility used the production cost model UPLAN modeling to analyze these scenarios. Presentations by Austin Energy and others are online.¹

Austin Energy presented information regarding the cost and risk of achieving various scenarios using 20-year Net Present Value (NPV). The following chart is a summary of results without a

¹ <https://austinenergy.com/wps/portal/ae/about/reports-and-data-library/generation-resource-planning-update/euc-resource-planning-working-group!/ut/p/a1/jZDNTsMwEISfpYccE7suPxG3YFAa2hJQRTC-IBMcJyK1rY3dSDw9CVwApdC9rFb7za5mEEcMcS32jRKuMVq048zPnjGJyZJi>

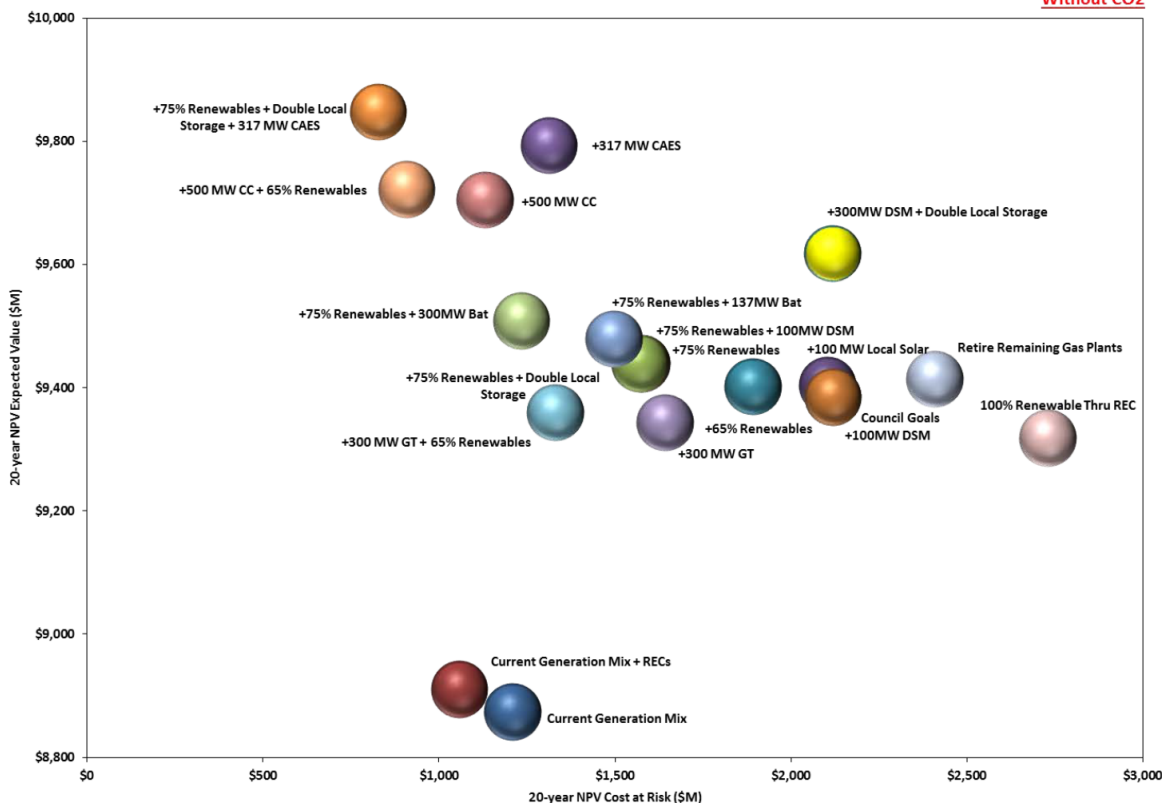
cost for CO2 of the costs and risks associated with each Scenario. Circles to the left on this slide have less financial risk and those on the right have more risk.

20 Year Net Present Value(NPV) vs. Cost at Risk (Without CO2)

20- year Net Present Value vs. Cost @ Risk (Levelized 2017\$)



Without CO2



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The results of the modeled scenarios would be impacted by changes in fuel costs (i.e. natural gas), increasing renewable energy penetration, changing ERCOT market design, and costs associated with the retirement of the Fayette coal plant.

The working group discussed the scenario modeling options presented by Austin Energy in light of affordability and climate protection goals.

Public Testimony:

The Electric Utility Commission Resource Planning Working Group heard from several invited speakers regarding various energy and environmental issues and current technologies, and accepted public comments at the start of each meeting. Many of the public comments received highlighted the importance of reducing greenhouse gas emissions and other pollutants to reduce impacts on the environment and public health. Members of the group were provided an opportunity to present as well.

Affordability:

Affordability is an overarching goal. The affordability goal is an average 2% per year limit on rate increases system-wide and for rates to be in the lower 50th percentile statewide. Austin Energy is currently meeting the affordability goal of keeping overall electric rates from increasing over 2% each year system-wide. Except for the years 2013 and 2014, Austin Energy rates have been in the lower 50th percentile.

The Working Group concurs with the statement in the Austin Energy Resource, Generation and Climate Protection Plan to 2025: An Update of the 2020 Plan, which reads “Austin Energy must be financially sound, the cost of electric service must be affordable for all classes of customers (with particular attention to the low income and underserved customers), and rates must be competitive to ensure the retention and attraction of businesses for a strong local economy.”

Resource Costs

Estimated Levelized Cost of New Dispatchable Resources, 2016 (\$/MWh)										
Plant type	Average Capacity Factor (%)	Fuel Type	Overnight Capital Cost 2016 (\$/KW)	Heat Rate Btu/kWh	Base				Low	High
					Levelized Capital Cost	Levelized O&M	Levelized Fuel	Levelized Total		
Dispatchable Technologies										
Advanced Combined Cycle	55%	Natural Gas	800-1089	6,480	12.58	8.51	30.04	51.13	37.72	80.41
Advanced Combustion Turbine	10%	Natural Gas	400-900	8,200	46.18	10.85	38.31	95.34	64.57	151.21
Compressed Air Energy Storage (CAES)	24%	Gas/Air	1500-2000	4,227	92.55	9.87	26.55	128.97	105.99	161.68
Battery Storage	7%	Battery	775-2000	N/A	278.60	32.01	36.25	346.86	212.34	486.56

Estimated Levelized Cost of New Non-Dispatchable Resources, 2016 (\$/MWh)										
Plant type	Average Capacity Factor (%)	Fuel Type	Overnight Capital Cost 2016 (\$/KW)	Heat Rate Btu/kWh	Base				Low	High
					Levelized Capital Cost	Levelized O&M	Levelized Fuel	Levelized Total (Base)		
Non-Dispatchable Technologies										
Onshore Wind (West Texas)	40%	Wind	See Note 2	N/A	23.69	2.71	0.00	26.40	23.00	30.00
Onshore Wind (South Texas)	30%	Wind	See Note 2	N/A	30.55	5.03	0.00	35.58	31.00	40.43
Photovoltaic (>50 MW West Texas)	33%	Sun	See Note 2	N/A	27.25	5.75	0.00	33.00	28.00	38.00
Photovoltaic (<20 MW Local)	20%	Sun	See Note 2	N/A	74.03	11.87	0.00	85.90	74.00	100.00

Notes:

(1) The above costs are levelized costs in \$/MWh and do not include revenues. The revenues vary depending upon the resources and their performance in the ERCOT market

(2) Sources of Technology Cost:

- Advanced Combined Cycle and Combustion Turbine per Energy Information Administration (EIA) 2014 update, adjusted based upon various discussion with vendors to reflect Austin Energy specific requirements
- Wind and Photovoltaic per latest AE Estimates from the latest Request for Proposal offers as a starting point and projected future capital costs (Range factors the latest approved tax credits & the timing of build out)
- Demand-Side Management per AE budget estimates within ERCOT
- CAES per market indicative offers
- Battery Storage per AE estimates from the Shines Project and market indicative proposals (Range factors the timings of the build out and assumes a 10% cost decline per year)

(3) Levelized capital cost estimates assumes: 100% Debt, Nominal After-Tax Weighted Cost of Capital (WACC) of 5.00%, Book life is based upon the life of the asset.

(4) High estimates include emission cost of \$12 per metric ton for annual CO₂ emissions, if applicable to technology (based on average of prices used in ERCOT's analysis of impact of the Clean Power Plan)

(5) Natural Gas Price \$5.00 per Mbtu, low \$3.00 - high \$9.00 per Mbtu

(6) Fuel cost for batteries and CAES includes the cost associated with their mode of operation (charging & discharging)

(7) The average capacity factor for CAES and Battery Storage assumes both modes of operations (charging & discharging)

(8) The Battery Storage assumes a capacity degradation of 6% per year.

This chart, provided by Austin Energy upon request of working group members, reflects resource cost inputs and does not include revenues that these resources would recover from the market. This chart shows that the most cost-effective new resources are utility scale renewables with a low range of \$23.00 to \$31.00 per megawatt hour and natural gas generation with a low range \$38.00 to \$64.00 per megawatt hour. In general, solar revenue would be higher than West Texas wind due to daytime pricing. South Texas and coastal wind revenue would be higher than West Texas wind revenue due to wind production during summer peak hours. Gas revenue is based on the locational marginal prices (LMP) at the time and the place it is generated. Austin Energy's 2017 levelized cost for new combined cycle gas generation is \$51.00 per megawatt hour.

Climate Goals:

Affordability and climate protection goals approved by Austin City Council can and should be met.

Under the Climate Protection Plan, Austin has a commitment to achieve net zero carbon emissions community-wide by 2050 and to reduce carbon dioxide from all city controlled generation resources to zero by 2030.

Scientists have sounded a warning about the urgency of reducing greenhouse gas emissions significantly in the next few years to avoid catastrophic climate change. Austin Energy has an obligation to do our part to transition away from fossil fuels. As the utility achieves these goals, it will serve as a model for other utilities to follow, expanding emissions reductions beyond its direct control. When carbon constraints are eventually adopted, having a carbon-free energy portfolio will also reduce financial risk for Austin Energy, its customers and the city.

Numerous citizens advised the Working Group to consider the urgency of addressing climate change and to act accordingly to quickly reduce greenhouse gas emissions.

WORKING GROUP RECOMMENDATIONS**Affordability:**

We reaffirm that the recommendations below are subject to the affordability goals, which includes a 2% per year limit on rate increases system wide and a goal for rates to be in the lower 50th percentile statewide. Renewable energy solutions are rapidly advancing and continue to decline in price.

Renewable Energy:

Commit to 65% renewable energy by the end of 2027, and study the possibility of a 75% and 80% goal for 2027.

As a result of improving technology and other reductions in cost of renewable energy generation, it has become feasible for Austin Energy to aspire to higher penetration of renewables in its generation mix. The utility is well on its way to accomplishing the 2025 goal of 55% renewable generation set out in the previous generation plan. Austin should increase this goal to 65% renewable energy generation by 2027, with a study goal of 75 to 80% renewables by 2027 if technically and economically feasible.

With the exception of specific items set out elsewhere in this report² and commitments already made, this plan does not designate the components of the renewable portfolio. Instead, Austin Energy should plan for least-cost and least-risk acquisition of renewable resources. Austin Energy should propose and develop the optimal renewable portfolio to meet this plan's goals

² The specific investment goals referred to here are for energy efficiency, demand response, local solar and energy storage.

and the utility's needs given existing generation assets, market conditions and the needs of the utility.

Austin Energy should explore both long-term and flexible short-term renewable energy contracts to provide affordable renewable solutions for Austin Energy customers.

Austin Energy's UPLAN modeling software estimates the financial gap between 55% renewable and 65% renewable commitments by 2027 to be a reasonable goal.

Dispatchable renewable energy sources do not currently exist on a large scale in Texas and electric storage technologies are not widespread at this time. At some point in the future, this situation may pose a financial risk to Austin Energy. In addition, local transmission constraints and price spikes would make local dispatchable energy resources that can be integrated with renewable energy beneficial to Austin Energy and its customers.

The Working Group advises that dispatchable renewable energy, energy storage, and voluntary demand response need to be part of future resource planning process and have recommended future studies of these and similar resources before the next resource plan.

Local Solar:

Maintain Existing Local Solar Goals:

- 110 MW by the end of 2020 (at least 70 MW customer-sited)
- 200 MW by the end of 2025 (at least 100 MW customer-sited)

Local Solar Incentive Budgets:

- Commit to \$7.5 million per year for FY18 and FY19
- Commit to \$5 million per year for FY20-FY27

Additional Local Solar Policies and Programs:

- Commit to enhanced incentives and/or programs for affordable housing projects by FY 2018.
- Study and possibly pilot a utility managed rooftop solar program that requires no investment from customer participants.

Energy Efficiency and Demand Response:

Austin Energy has the goal of achieving at least 800 MW of energy efficiency and demand response by 2020. In addition, Austin Energy will commit to 1,000 MW by 2027, subject to any methodology changes pursuant to the measurement and verification (M&V) consultant recommendation, code and manufacturer standards, technology, budgets and analysis of progress to date. The 2027 goal will be reevaluated by Austin Energy upon completion of the measurement and verification consultant study, and reset if necessary to reflect proportionate demand reduction savings given any new methodology implemented. Austin Energy will also assess the potential to reach 1100 MW by 2027.

Austin Energy will:

- Budget at least 2.5% gross revenues to Demand Side Management (recovered in the CBC and base rates) – Austin Energy will work with stakeholders to make future goals ‘budget-based’ rather than MW-based as has been done in the past.
- Commit to achieving a target of at least 1% of energy savings (as compared to energy sales) on an annual basis going forward.
- Commit to directing at least 15% of total DSM budget to existing and potential programs for low-income and hard-to-reach markets in the multifamily and single-family areas along with small businesses.

Local Energy Storage:

Commit to achieving 30 MW of local thermal storage by 2027, and a minimum of 10 MW of electric storage by 2025. Austin Energy is currently developing 3 MW of electrical storage with the help of a grant from the DOE SHINES program. Upon completion of these projects in 2018, Austin Energy will develop a roadmap for electrical storage based on the lessons learned from the SHINES project.

Decker Power Plant:

Target ceasing operations and beginning retirement of the Decker steam units, assuming ERCOT approval:

- Steam Unit 1 after summer peak of 2020
- Steam Unit 2 after summer peak 2021

Fayette Coal-Fired Power Plant:

We reaffirm the previous goal, established in 2014, to begin the retirement of Austin Energy’s portion of the Fayette Power Project (FPP), beginning by the end of 2022.

Study Emerging Technologies:

These include dispatchable renewable energy technologies, battery storage, compressed air energy storage (CAES), demand response, and Vehicle to Grid.

Updates:

Conduct resource plan updates in advance of cost of service studies every five years, unless significant changes in technology or market conditions warrant more frequent updates. Austin Energy will rerun cost analysis for the existing plan and provide an update on progress towards reaching established goals every two years. Reports will be provided to the City Council, the Electric Utility Commission and the Resource Management Commission.

Transportation:

Initiate private public partnerships that promote, market, and provide electric vehicle support that will increase utility revenue while reducing air pollution and greenhouse gases. Expand current efforts and, as possible, utilize these vehicles as a valid distributed storage technology.

Individual Comments from EUC Resource Planning Working Group Members

Paul Robbins

While I voted with the majority on most of the recommendations in the final report of the Working Group, I will briefly discuss points of disagreement, as well as an idea that was not considered for lack of time.

1. Protest of Lack of Review of Fayette Coal Plant Retirement – Austin Energy strongly discouraged the Working Group from reviewing or commenting on the proposed retirement of Fayette, stating that discussion could compromise its negotiating position. I am personally disappointed. If we are not allowed to discuss the environmental and economic implications of reaching this fundamental goal, then assuming Fayette’s retirement in our report is little more than empty rhetoric.

2. Vulnerability of ERCOT Grid to Intermittent Renewable Energy – Over reliance on intermittent wind and solar energy can cause economic as well as technical problems on the ERCOT grid. The Working Group officially acknowledged some of this in our report. However, I want to go further and caution Council that the ERCOT grid cannot technically come anywhere close to supporting a system-wide 65% renewable energy goal at this point due to lack of dispatchable clean energy alternatives and/or electric storage.

Austin Energy and several members of the Working Group believe dispatchability is ERCOT’s problem and not Austin Energy’s responsibility. I disagree. By not taking a long-term view, Austin Energy may suffer for this unforeseen problem and pay for its repair in the future, even if it is not Austin’s responsibility at this time.

Confronting the problems of renewable energy dispatchability is where the new leaders in the field of clean energy will need to direct their focus.

3. The Need for Austin Energy Involvement in Clean Energy Research and Development – Austin needs to help initiate and coordinate a nation-wide consortium of utilities, state and local governments, and non-profits to co-fund R&D of clean energy technologies. While theoretically this should be the province of the federal government, consistent and adequate federal funding has often been lacking, and likely will be lacking in this current Administration.

The Working Group did not have adequate time to discuss this concept, so I am submitting it as my own recommendation, asking for the City Council, and the Electric Utility and Resource Management Commissions to study the idea.

4. Austin Energy Participation in Compressed Air Energy Storage (CAES) – Austin Energy has been hypercritical of adding CAES as a dispatchable generation option, believing it is not economical for our utility to participate in a proposed plant in East Texas. My own analysis is that CAES is the most cost-effective electric storage technology available at this time, that it will

become economic when the price of natural gas inevitably rises, and that it has the lowest use of fossil fuel per kwh of any fossil plant. At some point in the future of CAES, substituting natural gas with hydrogen or with waste heat from the compression process itself may emerge as alternatives to eliminate fossil fuel use.

CAES should be treated as low-risk R&D. I believe Austin Energy should be a 10% partner in the first Texas CAES plant, joining with other Texas utilities and power plant owners. If the plant achieves success, it can be replicated. If it fails, no single utility will lose any great amount of money.

I estimate that, even assuming that this plant never operated, this 10% share would only raise AE's revenue requirements about 1/3 of 1% over its requirements in 2016. When natural gas goes up, I believe the CAES plant will actually make a profit.

5. Caution on Expectations for Vehicle to Grid Technology (V2G) – Some people attending Working Group meetings felt strongly about the need to research the use of batteries in electric vehicles to store intermittent renewable energy and route it into offsetting peak demand. While I support Austin Energy's involvement in R&D, I strongly caution Council not to expect too much from V2G in the near future.

The technology has not been commercialized anywhere in the world that I am aware of, its commercialized cost is largely unknown, and many electric vehicles will be on the road in rush-hour traffic at the very times their batteries would be needed for peak demand offset.

Richard Halpin

Additional Recommendations:

1. Increase renewables as generation sources maximizing low-cost contracts and translate those savings into *lower bills for ratepayers*. **Set a bold achievable goal of 100% renewable energy with parallel local storage by 2030**, in sync with already established City Council goals.

2. **Build on the AE storage research underway with more applied storage innovations.** Acknowledge, appreciate and leverage the research grant awards AE has won and the breakthroughs and new business opportunities AE can achieve and implement.

3. **Become known as an even smarter synergy-driven city.** As part of the city budget process, require City of Austin departments to propose in their new budgets major energy-saving goals and energy and cost-reduction partnership programs that will reduce silo behavior of departments and be in sync with our Resource Generation Plan and Climate Protection Plans and Paris accord local goals.

4. **Council could choose to promote programs and give innovation awards to city departments** that demonstrate energy and taxpayer saving breakthrough partnership projects.

5. Continue the cost and energy-saving exemplary leadership the Austin City Council has created in Council Resolutions 157 & 158. Make the required biannual progress review a chance to acknowledge accomplishments, new City of Austin and Austin Energy business income opportunities and a community fiesta. Council Resolution 157 can be found online at <http://www.austintexas.gov/edims/document.cfm?id=216608> and Council Resolution 158 is at <http://www.austintexas.gov/edims/document.cfm?id=216657>

6. Conduct a risk management study through the City Auditor's Office of potential vulnerabilities of South Texas Project 1 & 2 nuclear reactors, in terms of financial, health and catastrophic impacts. The reactors were originally set to retire in 2027 and 2028. A 20-year license extension application was filed in 2010 and an NRC decision is due in September 2017. Now is a good time for the City of Austin to look into the ramifications of continued involvement.

(<https://www.nrc.gov/docs/ML1634/ML16343A176.pdf>)

Background: South Texas nuclear reactors have had a troubled history that includes falsification of weld inspection documents during construction, a leak of a small amount of radioactive material outside the reactor head, a transformer fire and problems with replacement control rods not fitting properly. While operating an existing reactor may be low-cost, aging reactors are known become more risky to operate. Repairs and upgrades are likely to become increasingly expensive. Across the country, aging reactors are beginning to shut down. A nuclear accident could have serious financial, health and safety impacts. The Council could choose to have the City Auditor and Austin Energy look into getting out of our 16% share of the reactors and replacing the energy we receive with cleaner, safer and less financially risky forms of generation.

As an active member in local and national economic and environmental organizations for the past 35+ years, it has become clear to me that our local affordability and environmental priorities are shared with many other communities. Austin is a national leader, and in some ways, even a global leader. The increase of "Faith-Based" activity in these areas is impressive. My team at American YouthWorks co-created the first Austin Energy (AE) "Green Building" demonstration project in 1991. We won many local, state and national Best Practices awards for sustainable energy and human capital model programs over these 35 years. I am convinced that saving taxpayer money and the environment is common sense survival that is most effectively done with synergy. Austin is community advocacy wealthy, politically courageous and owns an electric utility with a smart hard-working community and industry sensitive staff with new leadership. !Si Se Puede!

Joint Statement

Bob Batlan, Janee Briesemeister, Todd Davey, Leo Dielmann and Susanne Vaughan

The EUC Resource Planning Working Group included representatives of diverse community interests that drafted a plan considering Austin's environmental leadership, the financial needs of the utility and affordability. The final report represents a balance of community viewpoints. The recommendations strongly reaffirm Austin's affordability goals, continue Austin's leadership on the environment, climate, and clean energy, and give Austin Energy the flexibility to minimize risk and maintain short and long-term affordability for ratepayers. As members of the Working Group we largely support the goals of the Report for the following reasons.

Affordability was a key driver. It is the primary condition that must be maintained while implanting the recommendations. In that context, the report contains proposals for aggressive but achievable environmental goals, including 65% renewables in the energy mix by 2027 and dates for shutting down the Decker Power Plant. Critically, the recommendations provide Austin Energy flexibility to address changing and uncertain conditions affecting energy markets, federal policies and renewable energy technologies. The recommendations do not "carve out" or set megawatt target goals for any particular type of utility-scale renewable energy or storage technology. The recommendations encourage Austin Energy to consider various solutions to achieve the renewable objectives including short-term agreements for renewable energy. Concerns were expressed about entering long term renewable agreements where costs are forecast to decline and the existing prices are above market levels, thus increasing costs for Austin Energy customers. Further, the Report recognizes that factors outside of Austin Energy's control, such as ERCOT market prices and costs to retire the Fayette Power Plant, could affect the cost analysis supporting the 65% renewables goal. The ability for Austin Energy to be flexible to manage unforeseen circumstances and achieve the recommendations while maintaining affordability is essential to the successful implementation of the Working Group's recommendations.

We appreciate the opportunity to participate in the Working Group process to develop the Report. Varied perspectives of the Austin community worked together to develop a balanced recommendation to address affordability and maintain Austin's environmental leadership position.

Joint Statement On Electric Vehicles

Bob Batlan, Janee Briesemeister, Leo Dielmann, and Susanne Vaughan

We are unable to support the following recommendation relating to Electric Vehicles (EVs): "Initiate private public partnerships that promote, market, and provide electric vehicle support that increase utility revenue while reducing air pollution and greenhouse gasses. Expand current efforts, and as possible, utilize these vehicles as a valid distributed storage technology."

EVs are worthy of study. However, recommendation of private public partnerships is premature and too prescriptive. The group was given insufficient information about the viability and affordability of such a venture. The vague language included implies it is recommended that Austin Energy extend and expand incentives paid to support EV purchase and EV charging stations. EVs are still in the early adopter stage and are not affordable for low-income rate-payers. Subsidizing early adopters is not consistent with Austin Energy's affordability goals and is outside of the scope of a resource plan. Until EV to grid is both viable and cost effective, EVs have no place being uniquely specified in a resource plan. If EV to grid becomes economically viable, the report suggests that Austin Energy has the flexibility to consider utilization of EV batteries as a distributed resource.

Kaiba White

The recommendations adopted by the Electric Utility Commission Resource Planning Working Group are an insufficient response to the climate crisis, don't adequately prioritize clean air and water, and will not ensure Austin Energy is a leader in new clean technology and program adoption.

Scenarios with many solutions were modeled by Austin Energy staff, but most of the proposed goal increases were excluded from the recommendations without any examination of whether or not they would be possible within the affordability goal.

The 75% renewable energy goal was rejected despite the fact that Austin Energy's model showed that it would cost only slightly more than the 65% renewable energy goal and would somewhat reduce cost risk to the utility. Other cities around the world, across the U.S. and even here in Texas are committing to 100% renewable energy in response to the climate crisis. It's important to consider that greenhouse gas emissions reductions in the next few years are more valuable than those made in later years. Scientists are raising the alarm that the climate is reaching a tipping point, at which avoiding catastrophic change won't be possible. Avoiding that calamity is a shared responsibility that extends to Austin Energy.

The previously adopted goal for all Austin Energy-controlled resources to be carbon-free by 2030 should be expanded to 100% carbon-free energy to supply all Austin Energy demand by 2030. That would include the approximately 15% of energy coming from the nuclear reactors at the South Texas Project (STP) and would require Austin Energy to produce or procure the remaining 85% from renewable energy sources. Setting a goal of 75% renewable energy by 2027 would put Austin Energy on a path to be carbon-free by 2030.

Meaningful increases to the energy efficiency, demand response, and local solar goals were rejected based on ad hoc analysis by Austin Energy that was contrary to the modeling results. Austin Energy staff convinced a majority of the working group that energy efficiency – long known to be the most affordable energy resource – is going to be significantly more expensive going forward. No analysis of the existing housing stock compared to the number of buildings that have received efficiency upgrades was presented to support the idea that most of the easy

and affordable efficiency upgrades had been done. Local solar goals were not increased at all, leaving the utility with lackluster goals through 2025 and no goals after that. Policy suggestions for improving equity by ensuring that local solar is accessible low-income residents and renters were rejected or watered down. Energy efficiency and customer-sited solar are important resources that lower customer bills, reduce environmental impacts, and grow the local economy. These resources have been a stronger focus in the past and should continue to be.

Despite Austin Energy's focus on its need to have controllable local generation, energy storage goals were increased by only 10 megawatts over the coming 10 years and demand response goals were not increased at all. Both should be important resources for a low or no-carbon electric utility and both are being utilized to a greater extent at other utilities. No numeric goals for supporting electric vehicle (EV) adoption or preparing the utility to utilize EVs as a resource were included in the plan, despite the considerable attention EVs have attracted in other city discussions.

The goals adopted by the working group will not make Austin Energy a leader in addressing climate change or air pollution, will not best position the utility to take advantage of new technology developments, and don't sufficiently focus on reducing bills (as opposed to rates).

I hope that the Austin City Council will take the time to fully examine all options and make more progressive recommendations that will increase benefits to our city and the planet.

Karen Hadden, EUC Resource Planning Working Group Chair

Meeting both affordability and climate protection goals is crucial, and it is increasingly possible to do so affordably. In fact, renewable energy and affordability go hand-in-hand.

Here's what the New York Times said on June 6, 2017, in an article entitled *In Trump Country, Renewable Energy is Thriving*:

"These red states are not motivated by a sudden desire to reduce greenhouse gas emissions. Nor are they joining solidly Democratic New York, Washington and California in defending the Paris climate agreement that President Trump walked away from last week. Instead, their leaders see tapping the wind, and to a lesser degree the sun, as an economic strategy.

The clean energy push allows their utilities to lock in low power prices for decades, creates manufacturing jobs, puts steady money in the hands of farmers who host wind turbines and lures big employers who want renewable power."

The Austin City Council set strong climate goals in Council Resolutions 157 and 158. The current Council should reaffirm these goals and Austin Energy should be held accountable for meeting them.

Austin Energy's scenario modeling results indicate that a 75% renewable goal by 2027 could be achieved without much additional expense. The urgency of climate change warrants increasing

the renewable energy goal to at least 75% by 2027, and a clear path should be designated to reach 100% renewable energy by 2030, a goal already set by Austin City Council.

The increased use of renewable energy and retirement of old gas and coal plants is not only financially advisable, but will also lead to air quality improvements and result in fewer air pollution related asthma attacks and emergency room visits. The risk of non-attainment of National Ambient Air Quality Standards for the City of Austin will be reduced as well.

Other Texas cities have been taking leading roles toward renewable energy recently, including Georgetown, which announced two years ago that it would supply its customers with 100% solar and wind energy by 2017 because of the low costs. The City of Denton has committed to 70% renewable energy by 2019.

While there is logic in the recommendation to allow Austin Energy the flexibility to choose between solar and wind in order to get the best pricing, we stand to lose the value of setting measurable numerical (MW) goals, which can be used to easily chart progress and assure accountability.

Austin Energy presented a Financial Forecast to the Electric Utility Commission on May 15, 2017. The full slide presentation from which several slides below are excerpted is online at <http://www.austintexas.gov/edims/document.cfm?id=276877>.

The affordability and competitiveness information in the slides included below is useful in making resource plan decisions that include meeting both affordability and climate protection goals. Austin Energy is financially healthy. The utility is meeting the affordability goal of keeping electric rates from increasing over 2% each year system-wide, and no price increases are anticipated in the next five years.

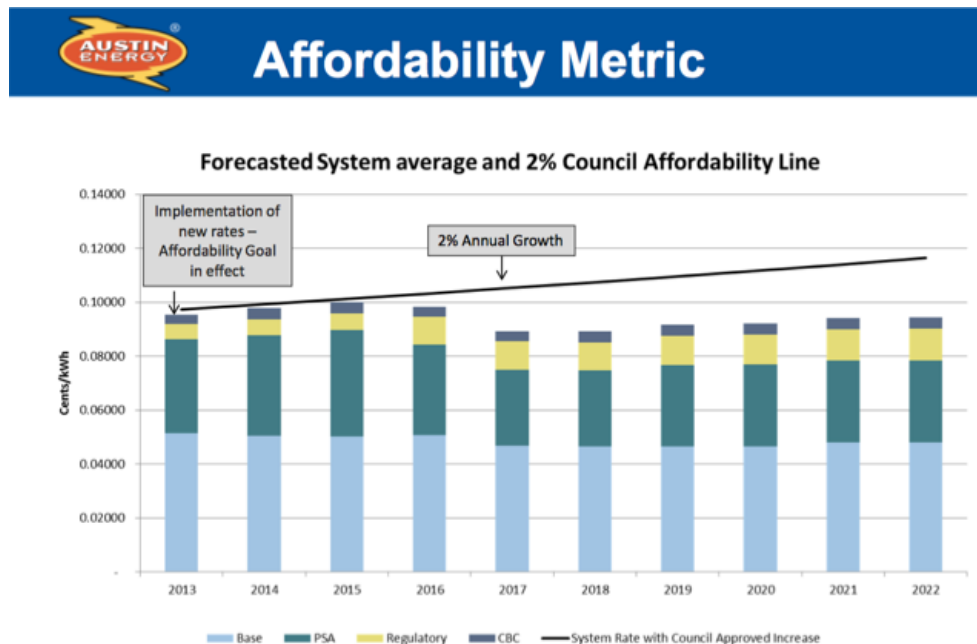
Austin Energy is currently meeting the affordability goal of keeping overall electric rates from increasing over 2% each year system-wide. Except for the years 2013 and 2014, Austin Energy rates have been in the lower 50th percentile, and Austin Energy is on track to meet this affordability goal this year. No base rate increase is expected in 2018, and the 5-year Austin Energy planning horizon forecasts 2% increase in FY 2021.

With the utility in good financial health, Austin Energy is well poised to undertake expanded goals. Hopefully programs and outreach will be designed to maximize benefits to all of the community, especially low-income customers.

Energy efficiency and demand response goals could be strengthened. This affordable resource benefits both the utility and customers. Investment in energy efficiency has helped keep Austin Energy bills low and is a key reason why Austin Energy was able to avoid a rate increase for 17 years. Improvements should be made in measuring and recognizing the full value of energy efficiency as a resource, since UPLAN is not good for modeling energy efficiency.

Lastly, I concur with the recommendation by Richard Halpin to conduct a study through the City

Auditor's office of potential vulnerabilities of South Texas Project 1 & 2 nuclear reactors, in terms of financial, health and catastrophic impacts. Aging nuclear reactors often become costly and unreliable, and an increasing number of reactors across the country are slated for closure because they have become uneconomical. It would be financially advisable to start looking into whether Austin should retain our 16% South Texas Project ownership. The nuclear reactors are set to retire in 2027 and 2028, but will likely get a 20-year operating license extension soon.



Austin Energy Forecast Highlights

FY 2017 Total Requirements \$1.27 billion; 1,718.0 FTEs

- **Austin Energy is financially sound; financial indicators improving**
 - Base revenue grows 2% due to growth in number of customers
 - Forecast indicates compliance with 2% affordability metric and trending toward metric of being in lower 50% of all Texas utilities
- **Key forecast assumptions**
 - Addition of up to 20 new positions projected for FY 2018
 - City-wide cost drivers included at \$5.7 million increase
 - Increases in renewable energy supply purchases projected
 - Council's adopted goal to achieve 55% of supply by 2025; currently at 38%
 - Non-nuclear decommissioning funding of \$8 million
 - Transmission expenses expected to grow by \$6.4 million
 - Lower nuclear and coal operating expenses \$8.7 million



Austin Energy Fund Summary

Austin Energy Fund Summary (in \$M)							
	FY 2017 Budget	FY 2017 CYE	FY 2018 Forecast	FY 2019 Forecast	FY 2020 Forecast	FY 2021 Forecast	FY 2022 Forecast
Beginning Balance	\$310.5	\$334.5	\$365.0	\$380.7	\$394.6	\$409.1	\$440.9
Revenues/Transfers In	1,284.2	1,306.0	1,323.9	1,370.0	1,388.9	1,420.8	1,433.4
Requirements:							
Operating Expenses	579.3	579.3	576.9	585.2	602.6	596.1	602.2
Power Supply Expenses	361.9	371.0	373.0	402.9	408.3	409.6	411.7
Debt Service	103.2	103.2	96.6	112.8	118.9	127.8	132.4
CIP	64.1	64.1	58.7	58.8	69.3	60.2	63.4
General Fund Transfer	108.0	108.0	109.0	110.0	111.0	113.0	115.0
Support Transfers	43.9	43.9	46.0	48.4	51.3	54.3	55.9
AE Reserve Transfers	6.0	6.0	48.0	38.0	13.0	28.0	28.0
Total Requirements	1,266.4	1,275.5	1308.2	1356.1	1374.4	1389.0	1408.6
Excess (Deficiency)	17.8	30.5	15.7	13.9	14.5	31.8	24.8
Ending Balance	\$328.3	\$365.0	\$380.7	\$394.6	\$409.1	\$440.9	\$465.7
FTEs	1,718	1,718	1,738	1,748	1,758	1,768	1,778