

EUC Resource Planning Working Group Recommendations for the *“Austin Energy Resource, Generation and Climate Protection Plan to 2035”*

Clean and Carbon-Free Energy for an Affordable and Livable Austin

Presentation to the Electric Utility Commission
February 12, 2024

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Kaiba White, Vice-Chair, EUC Resource Plan WG

Overview

1. Working Group Members & Process
2. Setting the Context for Recommendations
 - a. City climate goal - net zero by 2040, w/ most reductions by 2030
 - b. Federal money available
 - c. Fayette current usage and emissions
 - d. Local air pollution should be avoided
3. Our Preferred Resource Mix
 - a. Demand Reduction First
 - b. No Coal ASAP
 - c. Reduced Gas (REACH), retire by 2035
 - d. Solar and Renewables
 - e. Expanded Storage
 - f. EVs and DERMS
4. Affordability Goal
5. Future Studies & Process

EUC Resource Planning Working Group Members

EUC WG consisted of 16 Members: 5 from EUC, 4 from RMC and 7 additional

Cyrus Reed	Electric Utility Commission
Kaiba White	Electric Utility Commission
Dave Tuttle	Electric Utility Commission
Randy Chapman	Electric Utility Commission
Mick Long	Electric Utility Commission
Alison Silverstein	Resource Management Commission
Paul Robbins	Resource Management Commission
GeNell Gary	Resource Management Commission
Melissa Caragati	Resource Management Commission

Christian Fogerty	Sunrise Austin
Micalah Spenrath	residential customer
Autumn Gallardo	Foundation Communities
Al Braden	residential customer
Rodrigo Leal	Joint Sustainability Committee
Jim Stanway	Samsung
Marian Sanchez	PODER

EUC Workgroup Process

- WG analyzed 11 Austin Energy scenarios, 4 additional scenarios, separate presentations from associations and vendors, and made many requests for information from Austin Energy
- Presentations, resources, meeting notes and final recommendations and individual statements are posted here: <https://austineucresourceplanningwg.org/>
- WG met 14 times between September 2023 to January 2024 and released recommendations on February 1st
- Final Product Released on Feb 1, 2024 endorsed by 14 of 16 members.
 - One member - Melissa Caragati - recused herself as she left the RMC to take a job with the City of Austin
 - One member - Jim Stanway - while supporting most of the recommendations offered a dissenting opinion
 - Two other members - Mick Long and Randy Chapman - signed the recommendations and also offered additional comments

Federal Funding Can Help City of Austin and AE Meet Climate Goals

Two Federal Bills, the Infrastructure Investment and Jobs Act (IIJA) and the Inflation Reduction Act (IRA) offer significant funding:

- **Weatherization:** \$174 million (TDHCA) - includes money both for traditional weatherization agencies but also an RFP to administer a multi-family program
- **Energy efficiency:** \$10-15 million in revolving funds plus \$690 million in EE rebates, EE block grants and Building Code implementation (SECO)
- **Greenhouse Gas Reduction Fund (GGRF):** \$27 billion in all
- **Solar for All** - \$7 billion competitive competition both TDHCA and several coalitions of local governments in Texas have applied
- **National Clean Investment Fund:** \$14 billion for TA and lending institutions
- **Climate Pollution Reduction Grants:** \$250 million for planning and \$4.6 billion for competitive grants for implementation

City of Austin, AE and CAPCOG have been aggressive in applying for funding.

The Working Group believes that grants and other incentives from the IIJA and IRA will make the goals in the recommended plan more affordable and easier to achieve.

Air Pollution in Austin's Airshed a Concern

- Transportation is the leading cause of both ozone and PM 2.5, but Austin Energy's power plants are large point sources and thus are the low-hanging fruit for reducing emissions
- Austin area currently violates the federal health-based ozone standard and the new PM 2.5 standard, released on February 7th
- Eliminating nitrogen oxide emissions from power plants and avoiding investing in new sources that create air pollution is key to avoiding a nonattainment designation that will come with local economic costs
- Investing locally in new resources that could increase NOx or PM pollution would move in wrong direction and will make it very likely that Austin will continue violating health-based standards

Pollutant	Years	Federal Standard	Local Design Value
PM 2.5 (annual)	2019-2021	9	9.1
Ozone (8-hour)	2021-23	70	77 (Dripping Springs)
Ozone (8-hour)	2021-23	70	71 (Austin)

Austin Climate Goals

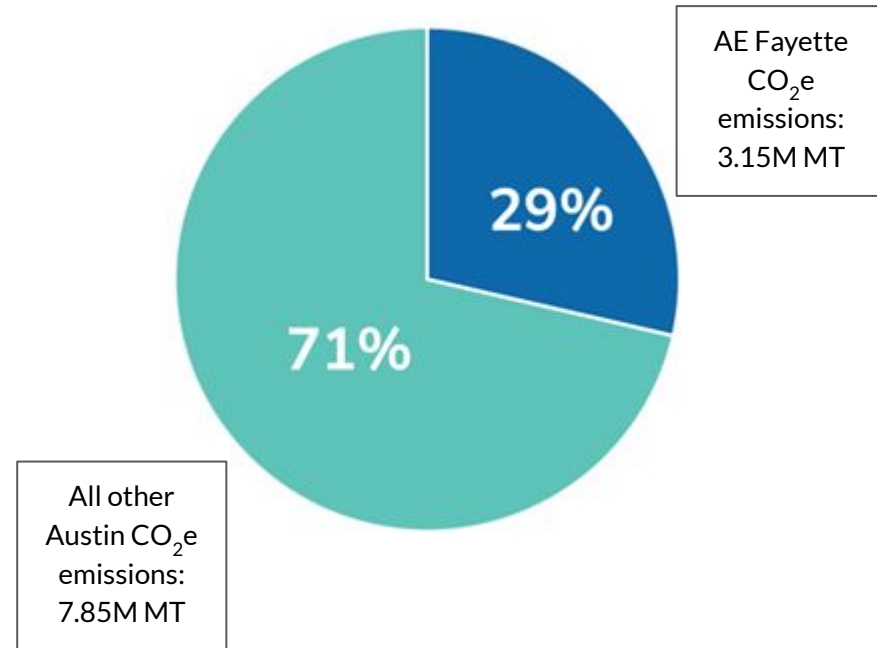
- The 2030 Resource Plan committed AE to being a zero-carbon utility by 2035 at the latest.
- The City of Austin's established climate protection goals are a driving force for this plan. The goal adopted by the Austin City Council in the Austin Climate Equity Plan (ACEP) is to achieve net-zero community-wide greenhouse gas emissions by 2040, with approximately 75% of those reductions to be achieved by 2030 with minimal use of carbon offsets only for the most difficult to decarbonize sectors.
 - **City of Austin can not meet its 2040 goal or interim goals without eliminating carbon emissions from coal and gas plants.**
- **The WG recommended 2035 AE Resource Plan builds on the past AE climate goal and aligns with the goals in the Climate Equity Plan.**



Cannot Meet Climate Goals w/ Fayette or Gas

- Austin Climate Equity Plan set goal for net-zero community-wide greenhouse gas (GHG) emissions by 2040, with majority of reduction by 2030 and limited use of offsets for hard to decarbonize sectors
- Assumption for achieving Austin GHG reduction goals was Austin Energy shutting down Fayette in 2022 and getting to zero GHG emissions by 2035
- Fayette is, by far, the single largest source of GHG emissions from the Austin community (29% in 2021)

Austin 2021 Greenhouse Gas Emissions



Fayette Coal Plant

- AE and LCRA have 50/50 ownership of Fayette Units 1 and 2, the land the plant is on, and the water rights at the reservoir
- Contract between AE and LCRA has no exit clause
- LCRA and Austin Energy each required to run their portions of Fayette units 1 and 2 to account for half of their Low Sustaining Load (LSL). LSL is the lowest level the plant can be on. AE's portion for the two units is 150 MW.
- LCRA is the operator, so all employees are LCRA employees, not AE
- Austin Energy unable to secure an exit thus far, though plant runs much less



Fayette CO₂ Emissions

Facility	2021 CO2 Metric Tons CO ₂ e
Martin Lake	13,502,540
Oak Grove	12,557,659
Parrish	12,840,973
Fayette (total plant)	10,987,388

**Sam Seymour
(Fayette) is 4th
largest source
of CO₂ in
Texas**

Fayette Greenhouse Gas Emissions	2021 CO2 Metric Tons CO ₂ e
Carbon Dioxide (CO ₂)	10,901,252
Methane (CH ₄)	31,508
Nitrous Oxide (N ₂ O)	54,628

Fayette Current Use

Facility	AE Actual Use, as % of Full Capacity, Calendar Year 2022	AE Actual Use, as % of Full Capacity, 2023 (Jan-Aug)
Fayette (50% of Unit 1 and Unit 2)	41% Unit 1 57% Unit 2	31% Unit 1 32% Unit 2

Facility	AE Fayette Generation as % of All Consumption, 2023, as of end Q3	AE Fayette Generation as % of Consumption, Calendar Year 2022
Fayette (50% of Unit 1 and Unit 2)	10.1% (approximately)	17.1%

Reduce Emissions Affordably for Climate Health

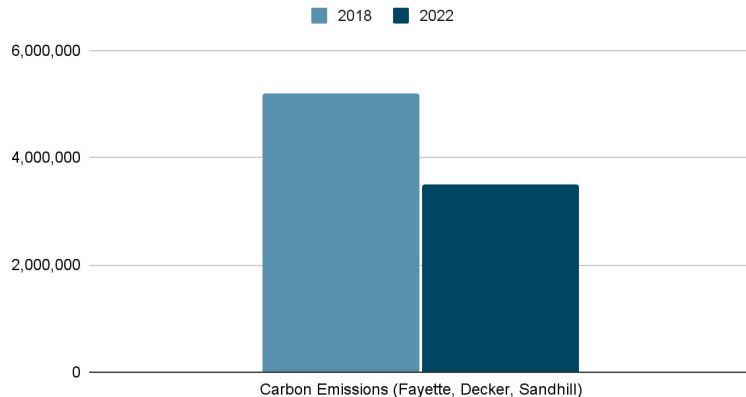
- Existing commitment from 2020 Austin Energy Resource, Generation and Climate Protection Plan: to run Austin Energy's portion of Fayette less by using the Reduce Emissions Affordably for Climate Health ("REACH") strategy until shut down at end of 2022 and then apply REACH to AE's gas generators
- Working group recommends maximizing use of REACH to further reduce use of Fayette to the minimum allowed by contract until shut down at end of 2022 and then to AE's gas generators

"Reduce Emissions Affordably for Climate Health ("REACH"), will incorporate a cost of carbon in the generation dispatch price, allowing Austin Energy to reduce generation output during low-margin periods but keep the resources available for high-margin periods. Austin Energy will apply an annual amount of approximately 2% of the prior year's PSA to implement REACH. Austin Energy will continue to adhere to the City Council affordability metrics through active portfolio management. The REACH plan is expected to reduce the utility's carbon emissions by 30% or approximately 4 million metric tons between approval of this 2030 Plan and Austin Energy's exit from FPP."

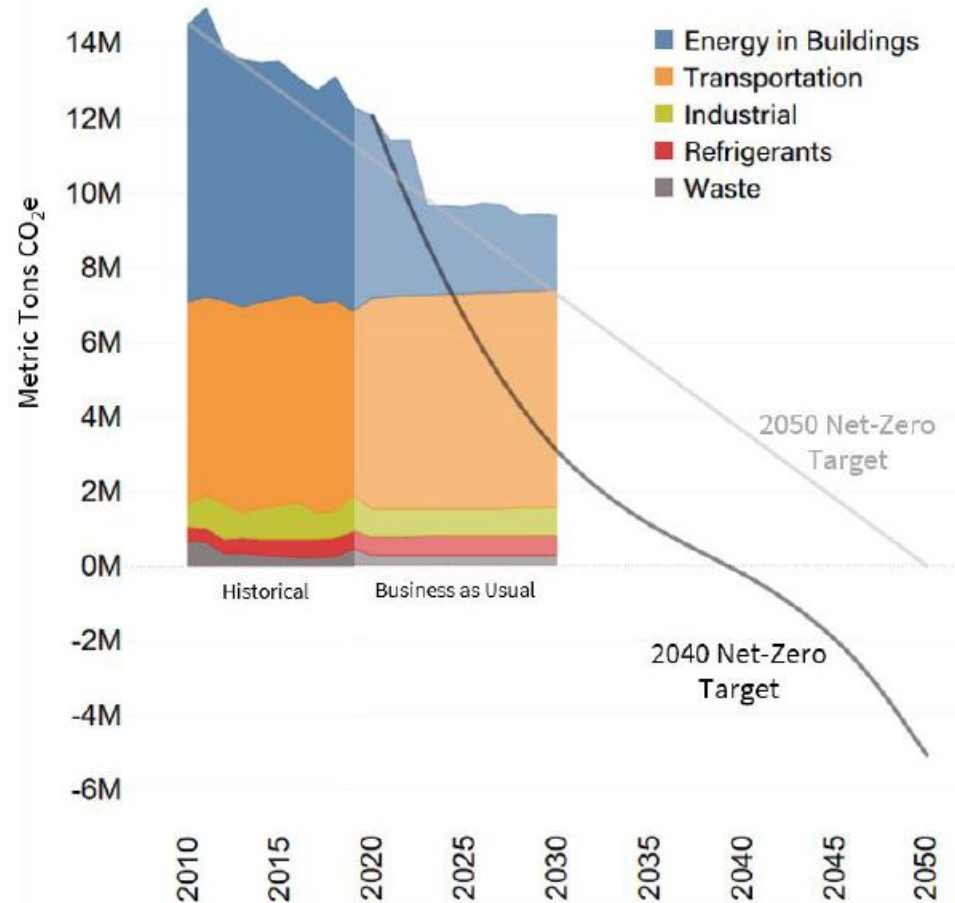
REACH Performance

- 4.12M tons CO2 emissions reduced in 2022
- \$12.45 cost per ton, much less than [EPA social cost of carbon](#) (\$46/per ton) and less than California and REGI carbon markets
- Fayette still running more than required
- Austin not meeting climate goal

Carbon Dioxide Emissions



Previous 2050 Net-zero Target vs. New 2040 Net-zero Target



Methane Gas and Hydrogen Combustion Increases Pollution

Scenario	CO2 Cumulative	NOx Cumulative	SO2 Cumulative
Carbon-Free 2035 w/ Green Hydrogen	27,543,273	7,299	1,025
WG Carbon-Free 2035 Scenario A	22,795,698	6,531	1,001
WG Carbon-Free 2035 Scenario B	22,916,039	6,548	1,001

Working Group Recommends AE Meet Demand w/ Renewables, Demand Response, Energy Efficiency, Existing Nuclear & Batteries

Year	Energy Efficiency	Demand Response	Renewable Energy	Local Solar	Storage	Coal & Nuclear	Gas Generation	Greenhouse Gas Reduction
2027	10% Winter & 18% Summer Peak Reduction	75 MW	65%	350 MW, with at least 150 MW behind-the-meter	150 MW, with at least 100 MW located in the Austin Energy load zone	Retire Fayette ASAP & Use REACH to limit use as much as allowed; No additional Nuclear	Reduce emissions by 33% using REACH. No new gas generation	between 7.6 and 84.5% reduction, depending on if Fayette is retired
2030	15% Winter & 23% Summer Peak Reduction	200 MW	76%	500 MW, with at least 200 MW behind-the-meter	400 MW, with at least 200 MW located in the Austin Energy load zone	No additional Nuclear	Reduce emissions by 66% using REACH. No new gas generation	92.1% reduction, assuming Fayette is retired
2035	20% Winter & 28% Summer Peak Reduction	300 MW	80%	700 MW, with at least 250 MW behind-the-meter	500 MW, with at least 300 MW located in the AE load zone - at least 100 MW of long-duration storage	No additional Nuclear	Gas plants retire. No new gas generation	100% reduction

WG Recommendation: Prioritize Energy Efficiency

- Proposed EE goals will reduce future Austin Energy energy use, peak and net-peak, deferring costs, lowering ancillary service obligations and giving us more flexibility.
- Proposed EE goals are based on a slight expansion in summer current projections, and significant expansion in winter programs
- WG also recommends a potential EE study focused specifically on winter programs
- Goal could be adjusted based on the study
- Working group also makes specific recommendations around equity goals within the access to EE services
- Austin Energy should continue to make sure new buildings are efficient and specifically move toward water heaters and heat pumps in all electric buildings

	2027	2030	2035
AE Current Programs Summer Load Reduction	15%	17%	18%
WG Goal Summer Load Reduction	18%	23%	28%
AE Current Programs Winter Load Reduction	4%	5%	5%
WG Goal Winter Load Reduction	10%	15%	20%

WG Recommendation: Prioritize Demand Response

- Demand response (DR) refers to strategies that allow customers to manually or automatically adjust their electricity usage, often shifting consumption of energy from times when demand or prices are high to times when demand or prices are lower.
- DR is can provide flexible response to peak summer and winter demand.
- DR must be encouraged through payments to reduce demand, including through smart thermostats, pool pumps, water heaters, time-managed of electric vehicle charging and utilization of customer-sited batteries
- Working Group recommends limiting the use distributed natural gas generators in the Resilience as a Service (RAAS) program to times then local prices are at or above \$1,500/MWh because using these resources will have health and environmental impacts on the community, especially neighbors

	2023	2027	2030	2035
AE Current DR Capacity	40 MW			
WG Goal Summer/ Winter DR Capacity		75 MW	200 MW	300 MW

WG Recommendations: Fayette

1. Run plant at the lowest level allowable by contract with LCRA using REACH (150 MW), until closure
2. Stop investing in capital improvements to the plant.
3. Spread cost of Fayette closure over 25 years.
4. Pursue federal funding for replacement power (perhaps near Fayette to create market pressure for plant to shut down)

WG Recommendation: Replace Gas Plants w/ Clean Energy

- AE uses gas plants at Decker and Sandhill to generate revenue
- They are major local sources of air pollution and greenhouse gas emissions
- Working group recommends the use of REACH to reduce use of the plants over time: reducing GHG by 33% by 2027 and 66% by 2030 and total phase-out by 2035
- Increasing local solar, energy efficiency, demand response and batteries can replace much or all value currently provided by gas plants
- Recommends study the need to replace their role in grid reliability (providing reactive power and voltage response) with clean technologies, including synthetic inertial technologies, turbines as synchronous condenser, as well as other voltage solutions at Decker and Sandhill

Percentage of AE load met by Decker GTs (gas turbine peakers), Sand Hill GTs, Sand Hill CC (combined cycle):

Year	FY 2021	FY 2022	FY 2023
Decker GT	0.36%	0.22%	0.54%
Sandhill GT	2.04%	2.46%	3.37%
Sandhill CC	8.95%	7.17%	9.22%

WG Recommendation: Add Renewable Energy

- Austin Energy currently is meeting 50% of its load through contracted renewable energy, mainly wind and solar
- Reaching 65% by 2027 will require another 650 MWs of solar energy (which can be local or utility-scale)
- Reaching 76% by 2030 and 80% by 2035 will require a similar amount of additional solar, or greater amount of wind or other resources
- AE should consider an ownership model because of tax incentive benefits of IRA
- New renewable energy resources should be paired with batteries where appropriate to improve their value and dispatchability.
- AE should consider piloting and study the potential for geothermal energy - a dispatchable technology - to meet part of the long-term goal



Solar Plus Storage in California's Mojave Desert (875 megawatts from solar along with 3,287 megawatt-hours of energy storage)

WG Recommendation: Expand Local Solar

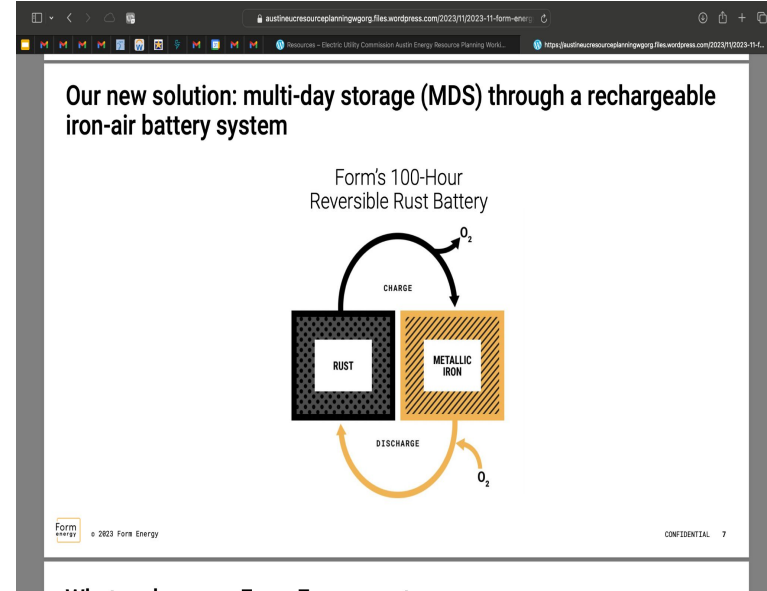
- Austin has been a shining example for local solar, and local solar helps lower peak use and provides generation without air pollutant emissions
- Expanding local solar deployment, including behind-the-meter installations is a key strategy in this plan. Proposed goals:
 - 350 MW, with at least 150 MW behind-the-meter
 - 500 MW, with at least 200 MW behind-the-meter
 - 700 MW, with at least 250 MW behind-the-meter
- Austin Energy should move swiftly to implement new solar programs such as a Standard Offer for Distributed Solar, which is under development. Program capacity should not be capped.
- Allowing third-party leasing and ownership for commercial operations could expand solar use in our load zone
- Community Solar program should be expanded to allow commercial customers to participate.



Photo by Al Braden

WG Recommendation: Storage is Preferred Flexible Resource

- Batteries are presently being built in ERCOT with more than 5,000 MWs operating and more than 11,000 MWs expected by end of 2024, yet Austin Energy has not prioritized this flexible resource
- Recommended electric storage goals:
 - 150 MW by 2027,
 - 400 MW by 2030
 - 500 MW by 2035, including at least 100 MW of long-duration storage
- Several long-duration promising technologies are already being installed in other markets, and AE should investigate the potential to install long-duration sooner rather than later
- At least half of the storage should be located in our load zone to help address local needs, price separation and potential voltage support
- Working group also recommends expansion of thermal storage goal to 50 MW by 2035



Example of a long-duration energy storage technology

WG Recommendations: Electric Vehicles & DERMS

- Deploy intelligent EV charging (also known as “V1G” for one-way flexible vehicle charging) to enable the vehicles to be valuable flexible loads.
- Support or develop programs that allow electric vehicles to become resiliency resources for backup power to homes or businesses with V2H (Vehicle-to-Home) or V2B (Vehicle-to-Building).
- Support the development of the EV infrastructure for the large batteries in local school districts and CapMetro electric bus fleets, such that they can be valuable sources of backup power in the future if the infrastructure is planned up-front.
- Enable the EVs to be distributed storage for the grid with V2G (vehicle-to-grid) as the technology develops.
- Encourage deployment of signage and software to broaden the visibility of charging infrastructure across the service territory and assist EV owners with locating chargers.

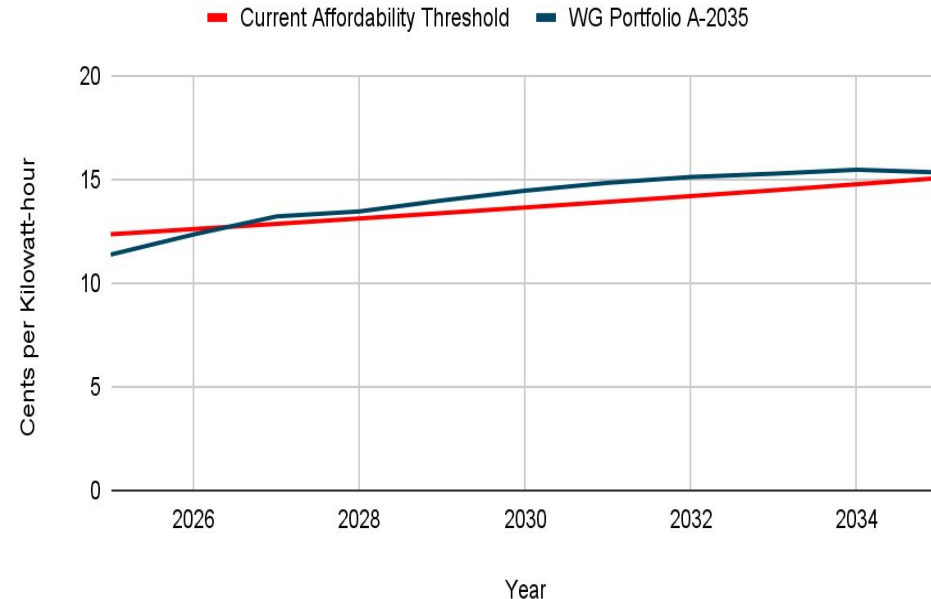
Distributed Energy Resource Management Systems (DERMS)

Austin Energy should begin to move toward a system that allows customer, third-party and utility-owned distributed resources to be aggregated and participate in energy and ancillary services, including potentially in PUCT pilot.

WG Recommendation: Adjust Affordability Goal

- Affordability goal was applied on a rigid annual basis (contrary to AE approach in rate cases) to modeled portfolios
- Current affordability requirement, first adopted by Austin City Council over a decade ago, is too restrictive because it is based on rates, instead of bills, and doesn't account for the cost-saving benefits of energy efficiency.
- Because customers pay bills, not rates, and Austin Energy's average residential consumption is significantly lower than the state average, the Austin Energy affordability goal should reflect the bill-reduction benefits of energy efficiency investments.
- The recommended goal is to "a) control all-in (base, fuel, riders, etc.) bill average increases to residential, commercial and industrial customers to 2% or less per year; and b) maintain AE's current all-in competitive bills for the residential class, and to the extent measurable, the commercial and industrial classes, in the lower 50% of all Texas' all-in electric bills."

Example: Working Group's Scenario A-2035 Was Coded "Unaffordable" Based on 2% Annual Rate Increase Criteria



WG Recommendation: No Hydrogen Combustion

Hydrogen will be an important component of the carbon-free future, but...

- Virtually all research puts the highest and best use of green hydrogen is not in the power sector but in air and sea transportation and industrial processes;
- Green hydrogen is not currently available at scale in Texas;
- Electrolyzers do not currently exist in the Austin area to convert water to hydrogen
- No power plants in Texas are currently combusting hydrogen on a commercial scale
- All credible information indicates green hydrogen will remain expensive because of the amount of energy it takes to create. (70% loss)
- Combustion of hydrogen or gas plus hydrogen creates local air pollution, including NOx that leads to ground-level ozone. Austin is already exceeding EPA standards for ozone.

Austin Energy models with hydrogen INCREASE carbon dioxide and NOx emissions over scenarios without hydrogen

Austin Energy should investigate other uses of hydrogen such as fuel cells (which don't pollute) as an emergency storage component, not as a baseload resource and not using combustion

WG Recommendations: Studies

- **Clean, Renewable, Flexible Energy:** assess new technologies that are carbon-free and flexible, including fuel cells, medium-duration and long-duration electric storage, and geothermal energy.
- **Winter Peak Load Reduction:** identify ways to achieve additional winter peak demand savings through energy efficiency, peak shifting, and demand response.
- **Electrification:** study of different electrification scenarios out to 2050 and evaluate needed reinforcements of the transmission and distribution system.
- **Transmission:** additional study of transmission and renewable energy imports, including a deep analysis of how demand-side measures can modify future Austin Energy load and energy import needs and how grid-enhancing technologies can be used to make Austin's transmission and local assets more capacity-efficient.
- **Reactive Power:** study current and anticipated voltage challenges and reactive power requirements and develop a plan to address and resolve those challenges. That plan should consider use of a) demand-side measures, including targeted energy efficiency and demand response to reduce reactive power needs; b) distributed solar and storage that can produce reactive power; c) transmission options, including new transmission, power electronics, and grid-enhancing technologies, and d) generation solutions.

WG Recommendation: Future Updates

- Updates to this plan should occur at least every 3 years to keep pace with technological and electric market changes.
- Austin Energy should commit to transparently soliciting and integrating feedback from robust community engagement throughout the entire update process.
- The next update should have the benefit of all the above studies.
- In addition to the 10-year operational plan, Austin Energy should include a longer 25-year outlook.

“Never doubt that a small group of thoughtful, committed citizens can change the world; indeed, it's the only thing that ever has.”

~Margaret Mead