Supplemental EUC Portfolio Questions Jan. 23, 2024 (updated Jan. 26, 2024)

Modeled peak summer and winter loads by year

Modeled Summer Peak in MW											
	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
A_2030	3,054	2,991	2,913	2,851	2,800	2,774	2,751	2,731	2,727	2,755	2,718
A_2035	3,054	2,991	2,913	2,842	2,799	2,774	2,751	2,731	2,727	2,755	2,718
B_2030	3,036	2,991	2,936	2,873	2,862	2,818	2,845	2,858	2,892	2,957	2,960
B_2035	3,063	3,033	2,994	2,940	2,908	2,882	2,880	2,874	2,893	2,945	2,944
CF_2035	3,079	3,102	3,122	3,131	3,156	3,171	3,189	3,202	3,233	3,261	3,290
CF_2035 Without REACH	3,079	3,102	3,122	3,131	3,156	3,171	3,189	3,202	3,233	3,261	3,290
CF_2035 + HCCC	3,079	3,102	3,122	3,131	3,156	3,171	3,189	3,202	3,233	3,261	3,290
CF_2035 + LDST	3,079	3,102	3,122	3,131	3,156	3,171	3,189	3,202	3,233	3,261	3,290
CF_2035 + LDST + HCCC	3,079	3,102	3,122	3,131	3,156	3,171	3,189	3,202	3,233	3,261	3,290
CF_2035 + LLDST + DST + HCCC	3,079	3,097	3,119	3,131	3,156	3,170	3,187	3,196	3,233	3,261	3,290
CF_2035 + LSOL	3,079	3,080	3,077	3,062	3,069	3,062	3,074	3,075	3,130	3,187	3,188
CF_2035 + LSOL + LLDST + DST	3,079	3,071	3,067	3,057	3,050	3,065	3,070	3,073	3,104	3,124	3,125
CF_2035 + LSOL+ HCCC	3,079	3,080	3,077	3,084	3,109	3,126	3,144	3,159	3,185	3,216	3,244
CF_2035 + LSOL + LLDST + DST + DSM	3,079	3,077	3,080	3,076	3,077	3,072	3,075	3,078	3,105	3,146	3,149
CF_2035 + LSOL + LLDST + DST + HCCC	3,079	3,064	3,054	3,069	3,090	3,105	3,122	3,134	3,168	3,196	3,224
Modeled Winter Peak in MW											
	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
A_2030	2,661	2,656	2,645	2,661	2,632	2,628	2,629	2,657	2,633	2,639	2,647
A_2035	2,661	2,656	2,645	2,661	2,632	2,628	2,629	2,657	2,633	2,639	2,647
B_2030	2,662	2,662	2,657	2,676	2,650	2,646	2,658	2,696	2,680	2,695	2,712
B_2035	2,662	2,665	2,664	2,688	2,662	2,658	2,665	2,698	2,680	2,692	2,708
CF_2035	2,662	2,675	2,687	2,723	2,707	2,715	2,725	2,763	2,749	2,764	2,779
CF_2035 Without REACH	2,662	2,675	2,687	2,723	2,707	2,715	2,725	2,763	2,749	2,764	2,779
CF_2035 + HCCC	2,662	2,675	2,687	2,723	2,707	2,715	2,725	2,763	2,749	2,764	2,779
CF_2035 + LDST	2,662	2,675	2,687	2,723	2,707	2,715	2,725	2,763	2,749	2,764	2,779
CF_2035 + LDST + HCCC	2,662	2,675	2,687	2,723	2,707	2,715	2,725	2,763	2,749	2,764	2,779
CF_2035 + LLDST + DST + HCCC	2,662	2,675	2,647	2,663	2,707	2,692	2,725	2,763	2,672	2,748	2,779
CF_2035 + LSOL	2,662	2,675	2,686	2,722	2,707	2,713	2,725	2,763	2,745	2,760	2,779
CF_2035 + LSOL + LLDST + DST	2,662	2,675	2,646	2,662	2,707	2,692	2,725	2,763	2,659	2,748	2,779
CF_2035 + LSOL+ HCCC	2,662	2,675	2,686	2,722	2,707	2,714	2,725	2,763	2,748	2,763	2,779
CF_2035 + LSOL + LLDST + DST + DSM	2,662	2,675	2,646	2,662	2,707	2,692	2,725	2,763	2,659	2,748	2,779
CF_2035 + LSOL + LLDST + DST + HCCC	2,662	2,675	2,646	2,662	2,707	2,692	2,725	2,763	2,659	2,748	2,779

Annual System Cost for each portfolio

AE Portfolios	Portfolio Cost (PSA + Incremental Fixed Cost due to portfolio changes) in $										
	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
CF_2035	583,900,589	631,491,589	692,276,709	687,744,709	772,508,709	834,069,544	935,548,544	988,948,544	987,052,544	987,052,544	982,468,551
CF_2035_Without_REACH	517,821,589	514,604,589	534,672,709	569,863,709	621,382,709	649,011,544	935,226,544	988,948,544	987,052,544	987,052,544	982,468,551
CF_2035 + HCCC	584,509,589	590,674,068	560,069,690	568,605,393	603,354,393	549,423,896	599,763,896	535,715,855	566,018,855	566,018,855	582,797,862
CF_2035 + LDST	583,418,589	635,117,880	700,597,494	707,475,334	794,904,017	839,209,538	936,491,499	970,562,490	982,140,741	990,813,795	970,052,428
CF_2035 + LDST + HCCC	584,745,829	591,359,581	570,142,848	584,258,301	614,035,414	558,197,452	600,985,981	603,482,343	630,368,475	630,368,475	647,354,123
CF_2035 + LLDST + DST + HCCC	583,557,589	606,771,821	575,575,748	587,823,122	622,610,122	570,599,132	616,899,132	622,388,132	645,797,132	645,797,132	656,621,139
CF_2035 + LSOL	583,418,681	641,677,015	717,989,491	710,451,403	801,157,427	868,803,033	977,278,980	1,027,541,938	1,038,991,423	1,038,991,423	1,038,151,293
CF_2035 + LSOL + LLDST + DST	582,610,925	651,536,118	733,109,067	721,461,038	813,174,052	880,960,272	976,648,196	1,016,349,131	1,041,621,008	1,041,621,008	1,055,446,574
CF_2035 + LSOL+ HCCC	584,745,829	603,200,530	573,257,929	575,189,718	606,971,916	540,321,889	587,817,323	592,623,659	614,803,874	614,803,874	626,345,185
CF_2035 + LSOL + LLDST + DST + DSM	582,610,925	651,431,972	717,610,528	715,073,457	807,208,511	872,273,035	896,122,539	877,189,440	961,430,115	965,430,115	1,023,303,364
CF_2035 + LSOL + LLDST + DST + HCCC	583,762,971	630,634,834	620,569,197	641,823,749	676,277,298	681,013,512	733,293,717	746,809,809	769,284,324	769,284,324	782,349,599

Working Group Portfolios	Portfolio Cost (PSA + Incremental Fixed Cost due to portfolio changes) in $										
	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Portfolio A_2035	615,004,279	694,948,257	749,636,475	729,798,281	774,908,354	779,033,695	851,549,619	847,162,729	853,529,998	869,386,805	792,672,431
Portfolio A_2030	620,997,643	710,565,348	767,835,657	787,149,278	851,384,322	884,083,150	1,129,520,901	1,150,709,261	1,149,109,261	1,152,669,138	1,097,044,267
Portfolio B_2035	610,346,004	676,947,243	736,085,276	731,017,548	477,771,120	799,454,884	873,632,384	879,680,291	890,803,155	894,310,335	868,604,810
Portfolio B_2030	631,595,901	693,302,105	750,793,266	771,119,547	527,722,834	850,160,853	1,124,903,967	1,181,874,187	1,182,439,187	1,182,675,346	1,183,973,194

The table above shows, by year, the annual levelized cost to customers for a particular technology portfolio under normal conditions. This includes the power supply adjustment (PSA) plus the capital and O&M costs of new supply resources. O&M costs for existing supply resources are removed as they are retired. These costs are represented as the gray box ($Cost) on slide 30 and subsequent slides in the November 2023 Austin Energy presentation to the EUC. The levelized value is calculated using the following formula:

$$\frac{\text{NPV (PSA + Incremental Fixed Cost due to Portfolio Changes)}}{\sum (1\text{-Discount Factor})^{n}}$$

The other risks/costs outlined for the various portfolios are explained further below. Note, they are not captured for every year, but instead generally represent the risk in any year.

Levelized cost and definition of what that means/how it is calculated for each resource

The levelized calculation for capital costs includes the recovery of overnight capital cost and fixed O&M costs over the operating life of the asset. The levelized calculation is similar to a mortgage calculation that converts a stream of varying payments to a single fixed payment. Steps involve, a calculation of a Capital Recovery Factor (CRF) which is then multiplied by the net present value of expenditures.

CRF:

WACC*(1+WACC)^Book_Life)/((1+WACC)^Book_Life -1).

Where: WACC stands for weighted average cost of capital.

Risk cost/year with explanation of how that is calculated; also, risk to whom – AE assets or AE customers?

As noted above, the risk categories (represented by the blue, orange and yellow boxes in Austin Energy's presentation) were not calculated for every year from 2025-2035. Instead, we performed a one-year calculation which could generally represent the risk to customers in any given year that risk is realized. Please refer to Batch 6 questions 3 and 8a for additional detail on each of the types of risks assessed. The risk is to Austin Energy customers as they ultimately have to bear the additional costs.

Specific projected costs of ERCOT market rules change risk and how that is calculated

Please see above

Cumulative Emissions by 2035

The following chart shows cumulative emissions (2025-35) in metric tons for each modeled portfolio.

Portfolios	Cumulative Emissions (2025-2035) in MT for Each Modeled Portfolio		
	CO_2	NO_x	SO_x
Do Nothing	23,542,971	7,882	1,013
CF_2035	21,521,278	6,343	995
CF_2035 Without REACH	39,679,537	16,057	3,051
CF_2035 + LSOL	21,290,425	6,310	994
CF_2035 + LDST	21,509,597	6,342	995
CF_2035 + HCCC	27,543,273	7,229	1,025
CF_2035 + LSOL+ HCCC	27,161,011	7,173	1,023
CF_2035 + LDST + HCCC	27,292,948	7,192	1,024
CF_2035 + LSOL + LLDST + DST	21,287,054	6,309	993
CF_2035 + LLDST + DST + HCCC	27,226,759	7,183	1,023
CF_2035 + LSOL + LLDST + DST + DSM	20,970,970	6,262	992
CF_2035 + LSOL + LLDST + DST + HCCC	26,394,535	7,060	1,019

For comparison purposes, Austin Energy also calculated the cumulative emissions for a modeled portfolio that continues to run Decker and Sand Hill units until 2035 and FPP until 2030 with REACH. This is shown in the table above labeled as "Do Nothing". For clarity, in the "Do Nothing" model run, REACH applies to only Fayette Power Project.

Please note, the cumulative emissions above are useful for comparison purposes only. They do not represent actual emissions anticipated. This is because Austin Energy does not intend to build any of the modeled portfolios, which each include, over the course of 10 years, 1000MW of new generation and 1400MW of retired generation. These build/retire values are constant across the portfolios to provide a basis for comparison. Again, AE does not intend to build a portfolio like the ones modeled. In reality, AE is more likely to incrementally build new generation and convert existing generation to a cleaner product while expanding its DSM programs and upgrading transmission. Austin Energy will use an incremental and iterative approach to manage the environmental and rate impact to customers while ensuring a reliable and affordable portfolio for customers. With many variables changing, both within and outside of AE control, one cannot pre-define the exact portfolio make-up year-over-year.

We can, however, provide some logic to support why we anticipate net emissions to reduce, even with the addition of a new local, dispatchable generator, even one that runs on natural gas during a bridging period to carbon-free by 2035. On non-tight market days, Austin Energy will run its newer, more efficient generation in place of some of its existing, less efficient generation. More efficient means better heat rate and less emissions. In essence, Austin Energy will be displacing its own supply stack with a more efficient, lower emission plant to produce the power needed on a typical day. Non-tight market days occur about 90% of the time. On a tight market day, Austin Energy will need all generation in its portfolio to mitigate load zone price separation, so the newer, more efficient generation will run as well as the exiting, less efficient generation. However, in the absence of Austin Energy's newer generation, load would be served by a much less efficient generator in ERCOT's supply stack. On these days (which account for about 10% of the time), Austin Energy will be displacing the ERCOT supply stack with a more efficient, lower emission plant. In net, the addition of a newer, more efficient dispatchable generator in Austin Energy's load zone will lead to fewer emissions. This will get better over time as Austin Energy works to replace natural gas with a cleaner fuel.

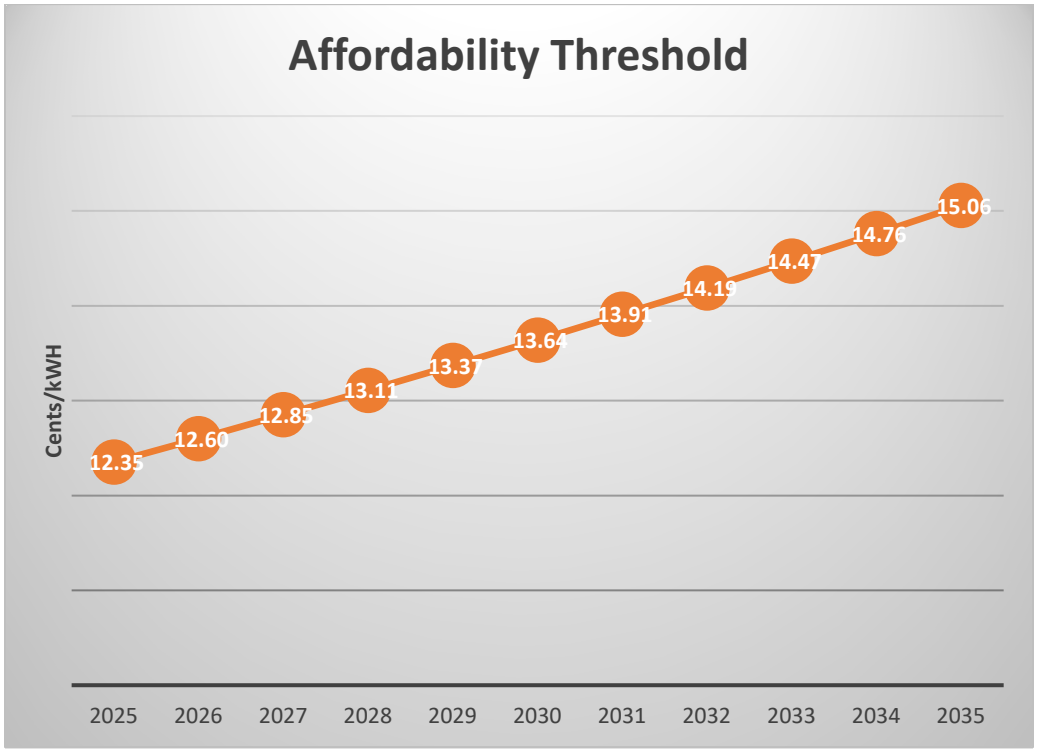
The following chart shows cumulative emissions (2025-35) in metric tons for each EUC Working Group modeled portfolio.

Working Group Portfolios	Cumulative Emissions (2025-2035) in MT for Each Modeled Portfolio		
	CO2	NOx	SOx
A_2035	22,796,698	6,531	1,001
A_2030	14,617,884	5,327	960
B_2035	22,916,039	6,548	1,001
B_2030	14,590,972	5,323	960

Please note, the model does not provide particulate matter data or calculations, and as such, we do not have that information for any of the portfolios.

Explanation of what "affordable" means and where that limit is

Affordability is a goal that is established by the City Council via resolution that was approved on February 17, 2011. It limited the rate increase to 2% or less per year starting in 2011. Based on this metric, Austin Energy determined a system rate threshold that was used as the "measuring stick" for maintaining affordability as shown in the graph below.



There were several portfolios that did not meet the affordability metric because the system rate exceeded the affordability threshold in one or more years evaluated.

E.g.: Portfolio A_2035 from the EUC Working Group has a system rate that exceeded the affordability threshold for 8 out of 10 years in the planning horizon as below:

	System Rate in Cents/kWH										
	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Affordability Threshold	12.35	12.60	12.85	13.11	13.37	13.64	13.91	14.19	14.47	14.76	15.06
Portfolio A_2035	11.37	12.34	13.21	13.45	13.98	14.45	14.83	15.11	15.27	15.46	15.33

The following table shows the results of the affordability analysis for every portfolio (AE and EUC Working Group portfolios). Please note, rate making analysis is a complex effort that is not a formal part of the modeling process. These numbers cannot and should not be taken as actual rates. Instead, they reflect the total cost necessary to recover for each portfolio, and they serve as the best proxy we have for the affordability measure.

	System Rate in Cents/kWh										
	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Affordability Threshold	12.35	12.60	12.85	13.11	13.37	13.64	13.91	14.19	14.47	14.76	15.06
CF_2035	11.09	11.60	12.20	12.31	13.08	13.59	14.14	14.53	14.61	14.66	14.68
CF_2035 Without REACH	10.62	10.77	11.10	11.50	12.03	12.32	14.13	14.53	14.61	14.66	14.68
CF_2035 + LSOL	11.08	11.67	12.38	12.47	13.28	13.83	14.42	14.79	14.96	15.01	15.05
CF_2035 + LDST	11.08	11.62	12.26	12.45	13.23	13.62	14.14	14.40	14.58	14.69	14.60
CF_2035 + HCCC	11.09	11.31	11.28	11.44	11.86	11.58	11.79	11.41	11.72	11.80	11.99
CF_2035 + LSOL + HCCC	11.09	11.40	11.37	11.49	11.88	11.51	11.71	11.79	12.05	12.13	12.27
CF_2035 + LDST + HCCC	11.09	11.31	11.35	11.55	11.93	11.64	11.80	11.87	12.16	12.23	12.41
CF_2035 + LSOL + LLDST + DST	11.08	11.74	12.48	12.55	13.36	13.91	14.42	14.71	14.98	15.03	15.16
CF_2035 + LLDST + DST + HCCC	11.09	11.42	11.38	11.57	11.99	11.72	11.90	12.00	12.26	12.33	12.47
CF_2035 + LSOL + LLDST + DST + DSM	11.08	11.74	12.37	12.50	13.32	13.85	13.87	13.77	14.44	14.52	14.95
CF_2035 + LSOL + LLDST + DST + HCCC	11.09	11.59	11.70	12.00	12.41	12.54	12.75	12.89	13.15	13.21	13.36
Portfolio A_2035	11.37	12.34	13.21	13.45	13.98	14.45	14.83	15.11	15.27	15.46	15.33
Portfolio A_2030	11.41	12.46	13.34	13.85	14.52	15.25	16.69	17.18	17.27	17.34	17.39
Portfolio B_2035	11.31	12.10	12.86	13.15	11.51	14.23	14.61	14.83	15.02	15.10	15.08
Portfolio B_2030	11.52	12.32	13.13	13.65	12.05	14.82	16.46	16.88	16.98	17.03	17.06

Please describe Austin Energy's back-up plan if green hydrogen does not become available or cost-competitive in the Central Texas area in the coming decade.

Austin Energy will continue to evaluate the best path forward to meet our carbon-free by 2035 goal on an ongoing basis. Should it become readily apparent at any time that green hydrogen is not a viable pathway to help meet that goal, we would begin to exercise other options being explored. Without the benefit of perfect knowledge, any talk of an alternate path forward would be speculative at best. Among a long list of potential means for meeting those goals are alternative clean fuels, alternative clean generation solutions (such as geothermal), new wires and grid management technologies as well as looking at additional DSM and DR solutions that appear viable.

Current solutions include a diverse mix of generation, wires (transmission), and non-wires alternatives. We anticipate a changing future landscape would include a similar set of technology "buckets" with specific technologies within those buckets becoming more or less attractive moving forward. If any aspect of our path becomes not viable, we would change our plans to implement given technologies accordingly.

How much of peak summer and peak winter demand is currently reduced through Austin Energy's energy efficiency programs?

The following table shows the forecasted peak load impacts for AE's EE programs

		2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Summer Peak Demand		3,079	3,102	3,122	3,131	3,156	3,171	3,189	3,202	3,233	3,261	3,290
Forecasted	MW added/year	51.8	48.43	44.94	42.45	41.94	41.27	38.63	37.3	37.3	37.3	37.3
	Load impact	13%	14%	15%	16%	16%	17%	17%	18%	18%	18%	18%
Winter Peak Demand		2,662	2,675	2,687	2,723	2,707	2,715	2,725	2,763	2,749	2,764	2,779
Forecasted	MW added/year	51.8	48.43	44.94	42.45	41.94	41.27	38.63	37.3	37.3	37.3	37.3
	Load impact	4%	4%	4%	5%	5%	5%	5%	5%	6%	6%	5%

*Notes:

- Annual load impacts are not based exclusively on the MW added each year, but are based on the regression analysis of the whole portfolio that includes measure lifecycle attrition.
- All performance is based on AE's *current* portfolio mix (with no consideration for a winter performing portfolio)
- Summer Peak is about 800 kW/MW installed and Winter Peak is about 200 kW/MW installed

Please provide the percentage of AE load met on an annual basis for 2021, 2022 and 2023 through generation from:

a. **Decker peakers**
b. **Sand Hill combined cycle**
c. **Sand Hill peakers**

The table below shows the percentage of AE load met by Decker GTs (peakers), Sand Hill GTs (peakers), Sand Hill CC (combined cycle):

	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%