Cary Ferchill

301 Congress Ave., Suite 1050
Austin, Texas 78701

Phone: (512) 535-4342
Fax: (512) 535-1017
Email: cary@ferchill.net

August 14, 2009

TO: Austin Generation Resource Planning Task Force

FROM: Cary Ferchill - Member

RE: Bill Impact Analysis -- REVISED

System-Wide Bill Impact Analysis

Like each of you that I have spoken with about this, I was completely lost as to how to interpret the "Generation Scenario Average Monthly Class Bill Impact in 2020 from Current Rates" summary (the "2020 Rate Summary") that was distributed by Steven Machicek at our meeting on August 5. Having seen the later spreadsheet labeled "Replace FPP Generation Option Scenario – Estimated Monthly Rate Impacts" (the "Replace FPP Rate Scenario") that was distributed just before our meeting on August 12, I was still confused. So I talked to Steve, who was very helpful in explaining his work, and I have now been able to fill in the blanks and I think I understand it. I thought I would share my learning with you. For your convenience, copies of the two spreadsheets are attached to this memo.

Like you, I was confused that the net present values and the levelized costs set out for the various scenarios in the PACE reports could be in a very narrow range and at the same time the 2020 bill impacts set out in the 2020 Rate Summary were so divergent, given they are based on the same data. In addition, the rate impact seemed to order the scenarios in an illogical way. For example, the Least Cost Results scenario appeared to lead to higher rates than other scenarios. Logic leads one to believe that if the net present value is about the same and the levelized cost is about the same, then the rate impact should be about the same over the long run. That is just the way the math works as I understand it. However, that didn't appear to be the case in these reports.

Here is where I think the confusion comes from. Steve did the analysis he was asked for, but the ask was not complex enough to give us the information we need. First, the "Percent Increase (decrease)" line in the 2020 Rate Summary is merely the cumulative implied rate increase or decrease in year 2020, without taking into account what happens over the life of the investment. Second, the 2020 Summary does not necessarily model the way the utility would actually set rates or finance capital additions in the event any of these scenarios were followed.

This I think explains the ordering of the lowest to highest rate impact in the 2020 Rate Summary. For example, looking at 2020 rates, the No New Builds scenario appears to be lowest cumulative impact and the Replace FPP Scenario appears to be highest. However, if you looked at cumulative rate impact in 2013, the Replace FPP Scenario would likely appear to be one of the

lowest, and one of the other scenarios would be highest (I don't have detail on all the scenarios to compare). If you chose 2025 or 2035, all of the scenarios would be reordered yet again.

I think that in asking what would be the rate impact of the various scenarios in 2020, it was assumed that rates for all scenarios would naturally rise in a more or less linear fashion over time, so that at any point in time the cumulative rate increases could be compared. In practice this is probably at least partially correct, since AE has the ability to level out predictable expenses (not variable fuel costs) through its financing approach and rate structure and has good reason to do so.

However, in the PACE report, the timing of capital investments and other items appears to be simplified and lumpy rather than constant, so the implied expense for each scenario goes up and down every year. For example, if you look at the Replace FPP Rate Scenario, you will see that implied system-wide rates actually go down in 2010 (-0.3%) and again in 2011 (-0.5%), rise in 2012 (+2.1%), go down again in 2013 (-3.2%), increase a lot in 2014 (+14.9%), go down again in 2015 (-3.9%) etc. through 2020. I think this is a function of (A) the simplified way the PACE model plugs in the various investments as one-time investments on a date certain rather than the way they would actually be made, which is bit by bit over time (we can't build and finance a nuke or anything else in a single day), and (2) that Steve did not assume that AE would make any special effort to keep rates more level rather than increase them one year and decrease them the next as per the PACE investment schedules. In the real world, I doubt AE would decrease rates two years running when they knew they would have to increase them dramatically in the third year to cover additional debt service. They would probably just keep rates as constant as possible and let it balance out over time.

In addition, using the 2020 date captures the capital cost of obtaining assets, but it does not capture all of the benefit of the useful life of the assets that are being purchased. So, if you purchase an asset with a 40-year life in 2019, all of the debt hits the balance sheet and it begins to require annual debt service that will pay it off in 10 or 20 years, but the future benefit of operating the asset for 40 years is not included in the analysis. As I mentioned in our meeting on August 4, I believe that in order to get an understanding of the actual rate impact over time, you have to levelize the rates over the life of the asset, or at least average them out, so that you can get to the overall long-term rate impact.

Steve has shown the levelized system-wide rate for the period 2009-2020 in the latest spreadsheet for the Replace FPP Rate Scenario, but that is the only scenario for which we have seen this analysis. From the spreadsheet you find that the system-wide rate per MWh in 2009 is $86.96. If you look at the box in the lower left-hand corner of the spreadsheet, you will see that he lists two different values for different methods of levelizing rates over the 2009 through 2020 period. The average rate from 2009 through 2020 is $96.13. The second measure, the net present value of those rates, (assuming at a 5% discount rate) is shown to be $94.73.

I cannot be certain how these figures compare to the NPV and levelized cost figures in the PACE report, because the PACE report reflects cost of generation only and Steve's spreadsheet is loaded with additional items that go into determining overall system revenue, such as other system costs and profit for the utility. However, doing my best to back into the system revenue numbers, I believe that the average and levelized rate impact results for the various scenarios will be narrower than the cumulative rate impact in 2020 that is shown in the 2020 Rate Summary. If

so, that would square up more closely with the results from the PACE study scenarios. I can't know for sure until I see the levelized rate impact for the other scenarios.

Still, this will not reflect the lifetime value of the assets, and I believe that the results will be more skewed for scenarios that provide for large capital acquisitions near the end of the study period. So far as I can figure, there is no special aspect of the rate impact analysis that would cause scenarios of similar NPV and levelized cost to have widely varying rate impacts if the entire investment period is taken into consideration. If that is the case, we already have the analysis necessary to weigh scenarios in the PACE report. I don't think we need anything more than that.

If I am missing something here, I request that Steve correct me so we can get this right. I appreciate your indulgence for such a log memo.

Class by Class Rate Analysis

I don't want to beat this issue to death because I wrote about it in my memo of August 4. However, I will point out that the results of the rate allocation among classes in the Replace FPP Rate Scenario illustrates the problem of trying to analyze costs by looking at the disparate rate impact on the various classes of rate payers. The Replace FPP scenario essentially uses massive capital expenditures to replace fuel expenditures over time. If the current rate structure (which allocates fuel cost on a per MWh basis) were to stay in place until 2020, it would dramatically increase residential rates and leave industrial rates only marginally affected. Who could possibly think that would be commercially or politically feasible? On the flip side, some of the other scenarios could have the opposite effect, dramatically increasing industrial rates while leaving residential rates hardly affected. That also would never work. It would wipe out the industrial customers.

So again, I think that we should focus on levelized system-wide costs/rates, and assume that allocation of those rates among the various rate categories will be worked out in a rate proceeding when it makes sense. It is just kidding ourselves to think that we could maintain a rate structure that would substantially re-allocate the burdens among rate payers.

Austin Energy

Generation Scenario Average Monthly Class Bill Impact in 2020 from Current Rates

	Current Rates	No New Builds	Least Cost Results	Nuclear PPA	Strawman	Solar Breakthrough	Electric Vehicles	W-M Emissions Reductions	300 MW DG	Replace FPP
	2009	2020								
Residential (1,000 kWh)										
Base	$ 58.35	$ 46.51	$ 74.34	$ 68.43	$ 76.09	$ 80.08	$ 82.38	$ 84.15	$ 91.75	$ 99.34
Fuel	36.53	44.08	30.30	40.07	34.64	32.91	32.18	31.72	29.10	28.32
Total	$ 94.88	$ 90.59	$ 104.64	$ 108.50	$ 110.73	$ 112.99	$ 114.56	$ 115.88	$ 120.85	$ 127.66
Percent Increase (decrease)		-4.5%	10.3%	14.4%	16.7%	19.1%	20.7%	22.1%	27.4%	34.5%
Monthly $ Amt Increase (decrease)		(4.29)	9.76	13.62	15.85	18.11	19.68	21.00	25.97	32.78
General Service Demand (100 kW, 43,800 kWh)										
Base	$ 2,122	$ 1,692	$ 2,704	$ 2,489	$ 2,768	$ 2,913	$ 2,997	$ 3,061	$ 3,337	$ 3,613
Fuel	1,600	1,931	1,327	1,755	1,517	1,441	1,409	1,389	1,275	1,240
Total	$ 3,722	$ 3,623	$ 4,031	$ 4,244	$ 4,285	$ 4,354	$ 4,406	$ 4,450	$ 4,612	$ 4,854
Percent Increase (decrease)		-2.7%	8.3%	14.0%	15.1%	17.0%	18.4%	19.6%	23.9%	30.4%
Monthly $ Amt Increase (decrease)		(100)	309	522	562	632	683	728	889	1,131
Industrial (5,000 kW, 3,300,000 kWh)										
Base	$ 94,015	$ 74,939	$ 119,785	$ 110,251	$ 122,596	$ 129,026	$ 132,740	$ 135,588	$ 147,829	$ 160,061
Fuel	116,952	141,143	97,002	128,306	110,900	105,367	103,018	101,570	93,173	90,663
Total	$ 210,967	$ 216,082	$ 216,786	$ 238,557	$ 233,496	$ 234,393	$ 235,758	$ 237,159	$ 241,002	$ 250,724
Percent Increase (decrease)		2.4%	2.8%	13.1%	10.7%	11.1%	11.8%	12.4%	14.2%	18.8%
Monthly $ Amt Increase (decrease)		5,115	5,819	27,590	22,529	23,426	24,791	26,192	30,035	39,757
System Wide Rate Impact (2009-2020)		-3.2%	8.8%	14.1%	15.5%	17.5%	19.0%	20.2%	24.8%	31.5%
Capital Requirements (2009-2020)		$ 75,905,000	$ 2,012,455,000	$ 1,754,972,000	$ 2,049,062,250	$ 2,303,947,250	$ 2,662,826,750	$ 2,552,909,250	$ 3,303,889,250	$ 3,949,005,000

Austin Energy
Replace FPP Generation Option Scenario
Estimated Monthly Rate Class Impacts

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Residential (1,000 kWh)												
Base	$ 58.35	$ 63.17	$ 61.73	$ 63.52	$ 61.54	$ 75.02	$ 66.86	$ 77.93	$ 85.10	$ 88.40	$ 90.57	$ 99.34
Fuel	36.53	32.05	32.86	33.08	32.00	33.00	36.26	32.18	29.15	26.62	26.80	28.32
Total	$ 94.88	$ 95.21	$ 94.59	$ 96.60	$ 93.54	$ 108.02	$ 103.13	$ 110.11	$ 114.24	$ 115.03	$ 117.37	$ 127.66
Percent Increase (decrease)		0.4%	-0.7%	2.1%	-3.2%	15.5%	-4.5%	6.8%	3.8%	0.7%	2.0%	8.8%
Cumulative Increase (decrease)												34.5%
General Service Demand (100 kW, 43,800 kWh)												
Base	$ 2,122	$ 2,298	$ 2,245	$ 2,310	$ 2,238	$ 2,729	$ 2,432	$ 2,835	$ 3,095	$ 3,216	$ 3,294	$ 3,613
Fuel	1,600	1,404	1,439	1,449	1,402	1,445	1,588	1,409	1,277	1,166	1,174	1,240
Total	$ 3,722	$ 3,701	$ 3,685	$ 3,759	$ 3,640	$ 4,174	$ 4,020	$ 4,244	$ 4,372	$ 4,382	$ 4,468	$ 4,854
Percent Increase (decrease)		-0.6%	-0.5%	2.0%	-3.2%	14.7%	-3.7%	5.6%	3.0%	0.2%	2.0%	8.6%
Cumulative Increase (decrease)												30.4%
Industrial (5,000 kW, 3,300,000 kWh)												
Base	$ 94,015	$ 101,775	$ 99,455	$ 102,342	$ 99,155	$ 120,873	$ 107,735	$ 125,562	$ 137,111	$ 142,436	$ 145,921	$ 160,057
Fuel	116,952	102,609	105,218	105,924	102,464	105,654	116,098	103,023	93,321	85,247	85,812	90,673
Total	$ 210,967	$ 204,384	$ 204,673	$ 208,266	$ 201,619	$ 226,526	$ 223,833	$ 228,585	$ 230,432	$ 227,682	$ 231,733	$ 250,731
Percent Increase (decrease)		-3.1%	0.1%	1.8%	-3.2%	12.4%	-1.2%	2.1%	0.8%	-1.2%	1.8%	8.2%
Cumulative Increase (decrease)												18.8%
System Wide Rev per MWh	$ 86.96	$ 86.68	$ 86.24	$ 88.01	$ 85.22	$ 97.90	$ 94.08	$ 99.61	$ 102.81	$ 103.17	$ 105.22	$ 114.34
Percent Increase (decrease)		-0.3%	-0.5%	2.1%	-3.2%	14.9%	-3.9%	5.9%	3.2%	0.3%	2.0%	8.7%
Cumulative Increase (decrease)												31.5%
Projected GWh	12,500	12,563	12,675	12,966	13,107	13,129	13,255	13,388	13,541	13,647	13,768	13,912
Revenue from Svc Area Sales (millions)	$ 1,087,000	$ 1,088,907	$ 1,093,035	$ 1,141,178	$ 1,117,008	$ 1,285,367	$ 1,246,974	$ 1,333,519	$ 1,392,092	$ 1,407,878	$ 1,448,614	$ 1,590,661

	Average	NPV @ 5%
Revenue	$ 15,232,232	$11,023,492
GWh	158,450	116,367
	$ 96.13	$ 94.73