



Confidential Memorandum

To: Shannon Fisk, Earthjustice

From: Dr. Tommy Vitolo, Synapse Energy Economics

Date: September 6, 2012

Re: Off-System Sales

This memorandum details the extent to which the energy generated by coal-fired units considered for environmental retrofits (LaCygne 1, LaCygne 2, Montrose 1, Montrose 2, and Montrose 3) is used to supplement net off-system sales. The analysis compares two Plans: the no retirements plan (AAAK1), and retire LaCygne 1 but retrofit the other units plan (ADDK1). I believe that this comparison illustrates the impact of retrofits on net off-system sales for other coal-fired units under consideration for environmental retrofits as well.

To better understand how net off-system sales are impacted by the retirement of specific coal units, I compared Plan AAAK1 (no retirements) to ADDK1 (retire only LaCygne 1). Specifically, I used the data contained in the Energy Composition Chart files,¹ each of which contains the energy (GWh) generated by each generator unit for each year, 2012 – 2031. I filtered the data to only use ^{**} HC ^{**},² the “mid” case for all variables. By using a pivot table, I was able to tabulate LaCygne 1’s generation, the generation of all other units combined, and the total generation, all in GWh. By subtracting the generation necessary to meet system load³, I then tabulated net off-system sales (GWh). These calculations were performed for both Plan AAAK1 and Plan ADDK1, and presented at the end of this document in Table 1 and Table 2.

Observe that KCPL has significant net off-system sales in both studies, on the order of ^{**}HC^{**}% of all generation in AAAK1 and closer to ^{**}HC^{**}% in ADDK1. Further, observe that in both studies, in all years 2012 – 2031, the total amount of net off-system-sales energy is substantially more than the total amount of energy generated by LaCygne 1.

¹ Microsoft Excel files ^{**}

HC
^{**}

² I believe Endpoint 14 to be the endpoint which represents “mid” case for all variables ^{**}HC^{**}

^{**}

³ From Microsoft Excel file ^{**}

HC

^{**} Note that I am unsure of which level of DSM is incorporated in this prediction, but because studies AAAK1 and ADDK1 have the same quantity of DSM, I believe that this remains instructive, and may understate the quantity of net off-system sales.

One can then take the difference between the two results. This represents how much more (or less) energy is generated from each unit in the two studies when compared directly. As one would expect, there is more energy generated at LaCygne 1 in the AAK1 Plan than ADDK1 beyond year 2015, as ADDK1 retires LaCygne 1. Notice that the extra LaCygne 1 generation in Plan AAK1 is very closely correlated with the extra Total Generation. That is, in years after 2015, LaCygne 1 generates about $^{**} HC ^{**}$ GWh per year, and the KCP&L system generates a total of about $^{**} HC ^{**}$ GWh more per year in plan AAK1 (no retirements) than in ADDK1 (LaCygne 1 is retired). For every single year from 2015 until the end of the study, more than $^{**}HC ^{**}\%$ of the electricity generated at the retrofitted LaCygne 1 unit can be directly linked to an increase in net off-system sales. This information is contained in Table 3.

KCPL appears to presume that they can sell energy off-system at a higher price than their operating costs at any of the five coal units discussed in this memorandum, for all or most hours of the year, for every single year from 2015 to 2031. I reach this conclusion because AAK1 is identical to ADDK1 except for the availability of LaCygne 1 for years 2015 – 2032, and in those years LaCygne 1 is dispatched at or near full availability and capacity, with nearly all of its energy added to the net off-system sales column. This 17 year assumption about off-system sales price versus operating cost is what allows them to run the LaCygne and Montrose (retrofitted) units almost every hour of the year in which they are available, regardless of that hour's KCPL load. KCPL needs capacity to meet reserve margin requirements, but it is using an assumption of what amounts to infinite demand for the energy generated at LaCygne and Montrose to ensure the capacity factors necessary to “justify” their retrofits. If those sales don't materialize because market price falls below the generation costs, the capacity factors of those units will fall and may render the retrofits non-economic. Low natural gas prices, depressed demand due to DSM elsewhere in the Southwest Power Pool (SPP), or new generation coming online with lower marginal costs elsewhere in SPP could render retrofitted LaCygne and Montrose units uneconomic for more and more hours each year. To the extent that the economics of the retrofit investment depend on net off-system sales) and it appears to be quite a large extent), the economics are uncertain and speculative.

Table 1. Plan AAK1

Year	LaCygne 1 Generation	All Other KCP&L Generation	Total KCP&L Generation	Load Requirement	Net Off- system Sales	Net Off- system Sales as % of Total Generation
2012	** HC					
2013						
2014						
2015						
2016						
2017						
2018						
2019						
2020						
2021						
2022						
2023						
2024						
2025						
2026						
2027						
2028						
2029						
2030						
2031						**

Table 2. Plan ADDK1

Year	LaCygne 1 Generation	All Other KCP&L Generation	Total KCP&L Generation	Load Requirement	Net Off- system Sales	Net Off- system Sales as % of Total Generation
2012	**					
2013	HC					
2014						
2015						
2016						
2017						
2018						
2019						
2020						
2021						
2022						
2023						
2024						
2025						
2026						
2027						
2028						
2029						
2030						
2031						**

Table 3. Plan AAAK1 as compared to Plan ADDK1

Year	Change in LaCygne 1 Generation	Change in All Other KCP&L Generation	Change in Total KCP&L Generation	Percent of LaCygne 1 Generation Sold Off-system ⁴
2012	**H C			
2013				
2014				
2015				
2016				
2017				
2018				
2019				
2020				
2021				
2022				
2023				
2024				
2025				
2026				
2027				
2028				
2029				
2030				
2031				**

⁴ **Percent of LaCygne 1 Generation Sold Off-system** is the change in total KCP&L generation divided by the change in LaCygne 1 generation, that is, the fraction of additional LaCygne 1 generation which resulted in a GWh-for-GWh increase in net off-system sales.