VOLUME 3

Evaluation of SMUD's Additional Power Cost Requirements to Serve the Yolo Annexation Load

Global Energy Decisions

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1 GENERAL APPROACH

Global Energy has calculated the incremental power costs SMUD will incur in order to serve the Yolo annexation load. Global Energy performed this analysis by estimating and comparing the cost of power to supply load for two cases: 1) a SMUD-Only Case, and 2) a SMUD + Yolo Case. The change in power costs between these two cases represents the incremental costs SMUD will incur to serve the Yolo annexation load. The goal of this analysis is to capture only the incremental power costs of serving load and does not include costs addressed by others, such as additional transmission and distribution costs, administration costs, service costs and others.

The analysis was performed utilizing a resource planning approach where least-cost generation resources are added to meet load and reliability requirements. The cost of power is then calculated based on this resource build-out. The resource planning approach is the accepted methodology employed by utilities and municipalities in order to evaluate the economics of serving load. Global Energy has done resource planning for a large number of entities. The steps of the analysis are provided in greater detail below.

1.1 ESTIMATE POWER SUPPLY COSTS FOR THE SMUD-ONLY CASE

As an initial matter, it is clear that SMUD will need to add new resources by 2008 just to serve its current SMUD customer loads. SMUD currently has no excess supply to serve Yolo load. The starting point in the analysis was to determine the "gap" between SMUD's expected current customer loads, plus a 15% planning reserve requirement, and existing resources for SMUD (w/o Yolo) over the next 20 years. A 15% Planning Reserve margin is used in California to ensure Resource Adequacy (meaning the power system can continue to provide adequate supply even if certain resources experience forced outages, electric demand comes in higher than expected, etc.)[1] This "gap" was then filled by adding new, least-cost generation resources to SMUD's resource portfolio. Combined cycle resources were added when market power prices justified the investment. The decision to add combined cycle resources was also influenced by SMUD's expected load factor and the expected condition of the spot market. Global Energy analysis indicates that the most economic way for SMUD to fill this "gap" in the early years of this forecast is by adding simple cycle, gas-fired resources. The simple cycle resource is most economic since it has the lower capital cost and there is a good chance that spot market purchases can be made to avoid purchases of gas to run the simple cycle gas turbines. These gas turbines provide protection if prices for spot power go up (or spot power is not available at all), since the gas turbines can be used to ensure power is available and gas purchases may be cheaper than spot power. Finally, the least cost plan was adjusted to reflect renewable resources to satisfy the California's Renewable Portfolio Standard (RPS) target. Once the resource build-out was complete, Global Energy then performed a

[1] PG&E itself is required to maintain a 15-17% Planning Reserve margin. If SMUD does not maintain such a reserve margin, its power supply will be less reliable than a PG&E provided power supply.

hourly chronological operation simulation, running a dispatch model, which calculated the cost of serving load from the resources available or the spot market (including meeting load and ancillary services requirements) for each year under the least cost resource plan described above.

1.2 ESTIMATE POWER SUPPLY COSTS FOR THE SMUD+YOLO CASE

Next, Global Energy repeated the process described in Section 1.1 above, this time building SMUD's resource requirements based on the combined SMUD and Yolo annexation load. By combining the SMUD and Yolo loads in the study, any benefits associated with the synergies of serving the combined load from a single resource portfolio are captured.

1.3 CALCULATE SMUD'S INCREMENTAL POWER COST FOR SERVING THE YOLO ANNEXATION LOAD

In the final step, Global Energy calculated SMUD's incremental power costs associated with serving the Yolo annexation load. This was performed by computing the annual difference in the capital, fixed and variable power supply cost results from the SMUD+Yolo Case minus the results from the SMUD-Only Case for the 20-year study period and calculating the net present value (NPV) for the study period at a discount rate of 6%. [2]

[2] A discount rate of 6% because it is was used by SMUD to reflect the time value of money to SMUD customers.

2 MODELING METHODOLOGY

Global Energy used its state-of-the-art portfolio analysis model to determine the incremental power cost that SMUD would incur to meet Yolo load. The model is an hourly chronological economic dispatch model, dispatching resources hourly to meet hourly loads. Hourly load shapes are derived from historical hourly loads. In addition to meeting hourly loads, the model calculates Operating Reserve requirements hourly and dispatches resources to most economically use the resources to meet the combined hourly load and operating reserve requirement.

The model also reflects the reality that SMUD buys and sells power in the wholesale spot market to perform optimal power dispatch in meeting these hourly loads and operating reserve requirements. For example, if SMUD can buy spot market power at a cost lower than the operation cost of an otherwise needed SMUD resource, it will do so. Similarly, if SMUD has excess resource available in an hour, with the operating cost of that resource being lower than prices in the wholesale spot market, SMUD will run the resource and make the wholesale sale. Global Energy derived the forecast wholesale spot market prices for this analysis from its WECC Power Market Advisory Service database and forecast. The Market Advisory Service is a quarterly updated WECC-wide electricity and fuel price outlook utilized throughout the industry by utilities, municipalities, government agencies, private power companies and banks.

Since Global Energy's analysis does two analyses (one for SMUD-Only and one for SMUD+Yolo), Global Energy is able to capture the power cost efficiencies (if any) that result from combining the SMUD load with Yolo load.

3 ASSUMPTIONS

3.1 LOAD

The 20-year forecast of SMUD's expected load (expressed in GWh) is based on publicly available forecasts performed by SMUD. The expected load for the proposed Yolo annexation was provided by PG&E. It is the same load forecast used by SMUD in its staff report. In estimating peak demand (MW) requirements over the 20-year study period, Global Energy assumed that both SMUD and Yolo annexation load maintained a load factor consistent with SMUD's historical load factor of approximately 43%. Again, this assumption is consistent with SMUD's staff analysis. Tables 3-1 and 3-2 below summarize Global Energy's load and demand forecast for current SMUD and the proposed Yolo annexation over the 20-year study period.

Table 3-1 - 20-year Load Forecast (GWh)

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
SMUD	11,636	11,822	12,051	12,269	12,520	12,720	12,984	13,233	13,493	13,762
Yolo	1,381	1,423	1,434	1,462	1,490	1,519	1,549	1,604	1,612	1,644
Total Load	13,017	13,245	13,485	13,731	14,010	14,240	14,533	14,837	15,105	15,406
	2018	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**
SMUD	14,036	14,324	14,633	14,902	15,197	15,499	15,811	16,148	16,455	16,783
Yolo	1,676	1,709	1,744	1,775	1,806	1,836	1,868	1,898	1,957	1,963
Total Load	15,713	16,033	16,377	16,678	17,003	17,335	17,679	18,046	18,413	18,747

3.2 RESOURCE REQUIREMENTS

Annual resource requirements for the SMUD-Only Case were estimated by applying SMUD's historic annual load factor of approximately 43% to SMUD's load forecast. A planning reserve margin of 15% was then added to forecast total annual resource requirements expressed in MW. Resource requirements for the combined SMUD and Yolo annexation load were calculated in the same manner, using SMUD's historic load factor for both SMUD and the Yolo annexation. The use of SMUD's historic load factor to estimate the Yolo annexation resource requirements is consistent with SMUD's own staff analysis. The table below shows the annual resource requirements for SMUD and Yolo, including planning reserves.

Table 3-2: Annual Resource Requirement Forecast (MW)

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
SMUD	3,112	3,173	3,234	3,295	3,353	3,411	3,479	3,549	3,620	3,692
Yolo	369	381	383	391	398	406	414	429	431	440
Total Load	3,481	3,554	3,617	3,686	3,751	3,817	3,893	3,978	4,051	4,132
	2018	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**
SMUD	3,766	3,841	3,918	3,997	4,076	4,158	4,241	4,326	4,412	4,501
Yolo	448	457	466	475	483	491	500	508	523	525
Total Load	4,214	4,298	4,384	4,472	4,559	4,649	4,741	4,834	4,935	5,026

3.3 RESOURCE REQUIREMENTS

SMUD's existing resource portfolio, assumed to be the same for the SMUD-Only Case and the SMUD+Yolo Case, was developed for the 20-year study period using publicly

available SMUD documents and information. This existing resource portfolio includes the first phase of Consumnes that is currently schedule to be on line in 2006. SMUD's existing resource portfolio includes hydro, renewables, thermal, and contracted power resources. The key to this analysis is capturing the difference in power costs that would be incurred by SMUD as a result of serving the Yolo annexation load. It should be noted that certain costs that do not change from the SMUD-Only Case to the SMUD+Yolo Case are not included in the analysis. For example, while the capacity of the existing resource base is an important factor in the analysis, it was not necessary to determine the capital cost of existing resources. This is due to the fact that these costs are the same in the SMUD-Only Case and the SMUD+Yolo Case and, as a result, cancel each other out when the incremental wholesale power costs are calculated. For this reason, the total SMUD power costs reported in this analysis may not reflect SMUD's total power costs.

3.4 NATURAL GAS PRICE FORECAST

This the most critical input assumption. Global Energy used a forecast made in early 2005 by the California PUC. SMUD staff used an earlier and lower forecast. Since early 2005, natural gas prices (and gas price forecasts) have continued to go up. Consequently, Global has run different scenarios to consider the more recent CEC staff gas price forecast. The table below indicates differences in natural gas price forecasts:

Year	SMUD gas price forecast (nominal)	Global Energy/MPR gas price assumption (nominal)	CEC Staff forecast June 2005 ($2004)	CEC Staff forecast June 2005 (2.2%inflation) (nominal)
2008	4.92	5.3	6.75	7.36
2009	4.81	5.51	6.85	7.64
2010	4.89	5.68	6.75	7.69
2011	5.10	5.78	7.60	8.85
2012	5.12	5.77	8.50	10.12

Global Energy used the California Energy Commission's Revised 2004 California MPR 20-year Gas Price Forecast to simulate market electric power prices in our initial analysis. The MPR gas price forecast is used by the Commission to determine Market Price Referents (MPRs), which are estimations of the long-term market price of electricity for baseload and peaking power products. The CPUC uses MPRs in evaluating bid products received during the 2004 Renewable Portfolio Standard (RPS) power solicitations.

The forecasting methodology for determining the MPR gas price forecast is based on the forward Henry Hub (Hhub) gas price that is basis adjusted to California. NYMEX HHub futures prices are used for all or part of the first five years of the gas forecast. For years 6-20, a fundamentals forecast approach is used since there is little if any trading in gas futures prices after 5 years and hence a "market" derived price is not available. In

addition, a gas hedging transaction cost of 0.082/MMBtu is added to both the NYMEX and fundamental gas prices.[3]

SMUD used an outdated, lower gas price forecast as discussed later in this report. [4]

Table 3-3: CPUC's 2004 20-Year California MPR Natural Gas Forecast (nominal)

Year	Gas Forecast
2005	$ 6.43
2006	$ 6.06
2007	$ 5.61
2008	$ 5.30
2009	$ 5.51
2010	$ 5.68
2011	$ 5.78
2012	$ 5.77
2013	$ 5.88
2014	$ 6.03
2015	$ 6.25
2016	$ 6.41
2017	$ 6.56
2018	$ 6.77
2019	$ 7.04
2020	$ 7.36
2021	$ 7.54
2022	$ 7.74
2023	$ 7.93
2024	$ 8.14

Source: California Public Utilities Commission

[3] The CPUC determined this to be a reasonable forecast of the cost of a gas price hedge in D04-06-015.

[4] Since the time that Global Energy performed this analysis of power cost involved in a SMUD annexation of Yolo, gas prices have risen significantly, so that this Global Energy analysis does not reflect current cost of SMUD meeting Yolo load. A more recent view of gas prices would increase the cost beyond those shown here. Since SMUD staff used an even lower (and older) gas price forecast, the SMUD staff analysis is seriously problematic as a measure of the power cost of serving Yolo load.

As of this writing, the NYMEX forward strip for natural gas is as follows:

Year	Gas Price
2006	10.09
2007	9.05
2008	8.39
2009	7.88

3.5 CAPITAL COST ASSUMPTIONS FOR NEW RESOURCE ADDITIONS

Global Energy used the capital cost estimates adopted by the California Public Utility Commission (Commission) Revised 2004 California 20-year Market Prices Referent (MPRs) for generation resource capital costs in its analysis. Along with the natural gas price forecast discussed above, the Commission uses these capital cost estimates (as well other inputs) to calculate the Commission's MPRs for baseload and peaking power. The capital cost estimate adopted by the Commission for determining the MPR for combined cycle resources ($2004) is $720/kW. For peaking capacity, the capital cost estimate for determining MPR is $556/kW. SMUD used these same capital cost assumptions. SMUD staff also used these capital cost assumptions for baseload and peaking power in their analysis. However, as we discuss later in this report, SMUD's application of these assumptions in their analysis resulted in a significant underestimation of capital cost requirements to serve the Yolo annexation load. This issue is discussed later in this report.

3.6 RENEWABLE ENERGY ADDITIONS TO MEET RENEWABLE PORTFOLIO STANDARDS

SMUD's planning criteria include meeting a Renewable Portfolio Standard (RPS) of at least 20% of load (in GWh) with renewable energy resources. SMUD has not identified where or how it will acquire the necessary renewable energy resources to meet the 20% RPS target for the proposed Yolo annexation load. SMUD has stated it will meet a RPS target for Yolo, and Global Energy assumes it will meet a 20% RPS for Yolo. In order to estimate SMUD's incremental costs associated with meeting the 20% RPS for the Yolo load, Global Energy assumed that SMUD will meet Yolo load requirements with non-renewable generation resources based on the build out described above, and then purchase sufficient green certificates from the market. Global Energy estimates the cost of these green certificates at $5/MWh. For each MWh of Yolo load served, the purchase of green certificates is assumed to increase power costs by $1/MWh. SMUD staff employed similar renewable cost assumptions to estimate the cost of meeting RPS standards for the Yolo annexation load.

4 SIMULATION RESULTS

Using the aforementioned CPUC/MPR gas price forecast, Global Energy's simulation results show that it would cost SMUD $1.49 billion in wholesale power costs to serve the Yolo annexation load for the 20-year study period from 2008 through 2027. On a levelized $/MWh basis, the incremental cost of power to serve Yolo's load from 2008 to 2027 is $80.56/MWh.[5] Table 4-1 shows simulation results on an annual basis. As noted above, the key to Global Energy's analysis is to capture any changes in SMUD's power cost to serve load from the SMUD-Only case to the SMUD+Yolo case. For that reason, Global Energy focused only on those power costs that would potentially change as a result of adding Yolo load.

Table 4-1: Summary Simulation Results

	SMUD Power Costs to Serve Load: ($000)			Load (GWh)	Incremental Cost to Serve ($/MWh)*
YEAR	SMUD-Only	SMUD+Yolo	Yolo	Yolo	Yolo
2008	$429,391	$527,092	$97,701	1,381	$71
2009	$465,634	$567,902	$102,268	1,423	$72
2010	$524,618	$628,919	$104,301	1,434	$73
2011	$589,151	$703,665	$114,514	1,462	$78
2012	$645,471	$760,759	$115,288	1,490	$77
2013	$709,309	$836,153	$126,844	1,519	$83
2014	$740,830	$871,324	$130,495	1,549	$84
2015	$847,826	$971,711	$123,885	1,604	$77
2016	$907,265	$1,029,028	$121,763	1,612	$76
2017	$959,180	$1,085,309	$126,130	1,644	$77
2018	$1,020,693	$1,148,704	$128,011	1,676	$76
2019	$1,096,543	$1,214,522	$117,980	1,709	$69
2020	$1,174,532	$1,295,307	$120,774	1,744	$69
2021	$1,222,052	$1,347,893	$125,840	1,775	$71
2022	$1,276,722	$1,407,084	$130,362	1,806	$72
2023	$1,325,667	$1,508,875	$183,208	1,836	$100
2024	$1,379,069	$1,568,394	$189,325	1,868	$101
2025	$1,449,944	$1,647,679	$197,735	1,898	$104
2026	$1,638,333	$1,845,616	$207,283	1,957	$106
2027	$1,745,680	$1,968,572	$222,891	1,963	$114
NPV ('08-'27)	$10,140,561	$11,627,070	**$1,486,509**		**80.56***
* levelized value					

More detailed analysis results are provided in the Appendix to this Report. Tables A-1 and A-2 in the Appendix show the results of Global Energy's resource build-out,

[5] A levelized basis is used to represent a stream of different costs over a 20 year time period with a constant number of that same time frame, both streams having the same present value. In other words, a stream of $80.56 $/MWh every year for the period 2008-2027 has the same present value (using a 6% discount rate) as the stream of numbers in the right column of Table 4-1.

expressed in MW, for the SMUD-Only and the SMUD+Yolo cases. Global Energy has not added combined cycle for Yolo load in 2008 as was done by SMUD staff. Global Energy delayed the combined cycle for two reasons. First, it is not clear how SMUD could add combined cycle that soon for the purpose of meeting newly acquired Yolo load. Typically it takes one to two years to permit a CCCT and two more years to construct. Secondly, Global Energy's analysis indicates that spot market purchases can be made to displace burning natural gas in the peaker gas turbines, thereby making the gas turbine approach in the early years a more economic decision.[6]

Tables A-3 and A-4 show the generation dispatch results, in GWh, for each resource in SMUD's portfolio for the SMUD-Only Case and the SMUD+Yolo Case. Tables A-5 and A-6 show the cost of power to supply load, in $000, based on the economic dispatch modeling results for the SMUD-Only Case and the SMUD+Yolo Case. The cost of power results include the annual levelized capital costs for new resources added to SMUD's portfolio based on the capital cost assumptions provided above.

Table A-7 provides details for the costs in Table 4-1.

Because of the significant rise in natural gas prices since development of the CPUC/MPR gas price forecast, Global Energy has also done a preliminary revised analysis using the new CEC draft gas price forecast. While that forecast has not been finalized, it is worth seeing how that forecast would impact the cost of power SMUD would incur to serve Yolo load. Using the aforementioned CEC staff gas price forecast, Global Energy's simulation results show that it would cost SMUD $2.25 billion in wholesale power costs to serve the Yolo annexation load for the 20-year study period from 2008 through 2027. On a levelized $/MWh basis, the incremental cost of power to serve Yolo's load from 2008 to 2027 is $122/MWh. Global Energy's analysis of the power costs needed to serve the proposed Yolo annexation load using the CEC staff's gas price forecast is $953 million higher than the estimate made by SMUD staff as indicated in the Table below.

[6] A simple cycle gas turbine is often described as an airplane jet engine with a electrical generator attached to the turbine shaft. Natural gas is generally used to fire/spin the engine, with the spinning generator creating electricity. In this simply cycle mode, the exhaust gas from firing the jet engine released to the air. A combined cycle combustion turbine has additional equipment designed to make use of the hot exhaust gas. In the combined cycle design, the exhaust gas is channeled into a heat recovery steam generator designed to take heat from the exhaust gas and turn water into steam. The steam is then used to turn a steam/turbine. Attached to the shaft of the steam turbine is another generator that creates electricity when spinning. The combined cycle is more efficient since more electricity is created from burning the gas. However, because of the additional equipment needed, the combined cycle plant is more expensive to build than the simple cycle plant.

Power Costs to Serve Yolo Load ($ 000)		
Year	**CEC Gas - Global Energy**	**Staff Report**
2008	$127,680	$84,708
2009	$138,639	$85,308
2010	$139,459	$88,093
2011	$157,467	$92,378
2012	$180,903	$94,544
2013	$184,454	$100,193
2014	$177,120	$104,100
2015	$196,618	$107,907
2016	$207,082	$112,632
2017	$209,547	$116,587
2018	$217,156	$121,969
2019	$209,789	$125,417
2020	$215,348	$130,533
2021	$222,270	$136,009
2022	$231,164	$142,183
2023	$288,586	$148,258
2024	$248,112	$152,778
2025	$258,506	$160,331
2026	$320,135	$164,107
2027	$337,665	$173,353
NPV (08-27)	**$2,253,398**	**$1,299,782**
Difference	$953,617	

5 CRITIQUE OF SMUD'S ESTIMATES

Global Energy's analysis of the power costs needed to serve the proposed Yolo annexation load (using the CPUC/MPR gas price forecast) is $187 million higher than the estimate made by SMUD staff as indicated in Table 5-1.

Table 5-1: Comparison of Global Energy and SMUD Staff Results

Power Costs to Serve Yolo Load ($000)		
YEAR	Global Energy	Staff Report
2008	$97,701	$84,708
2009	$102,268	$85,308
2010	$104,301	$88,093
2011	$114,514	$92,378
2012	$115,288	$94,544
2013	$126,844	$100,193
2014	$130,495	$104,100
2015	$123,885	$107,907
2016	$121,763	$112,632
2017	$126,130	$116,587
2018	$128,011	$121,969
2019	$117,980	$125,417
2020	$120,774	$130,533
2021	$125,840	$136,009
2022	$130,362	$142,183
2023	$183,208	$148,258
2024	$189,325	$152,778
2025	$197,735	$160,331
2026	$207,283	$164,107
2027	$222,891	$173,353
NPV ('08-'27)	**$1,486,509**	**$1,299,782**
Difference	**$186,727**	

SMUD used a spread sheet model developed by RW Beck to estimate the cost of meeting Yolo load. The spread sheet model is not an hourly chronological dispatch model. The model is not capable of representing unit commitment decisions, hourly chronological operation constraints, hourly operating reserve requirements, spot market purchases and sales that SMUD does on a day to day basis. Because SMUD evaluated the Yolo load alone, it did not consider the potential impacts of integrating the Yolo load with SMUD's current customer load and does not capture the economic efficiencies or inefficiencies that would occur by combining hourly Yolo load with SMUD loads.

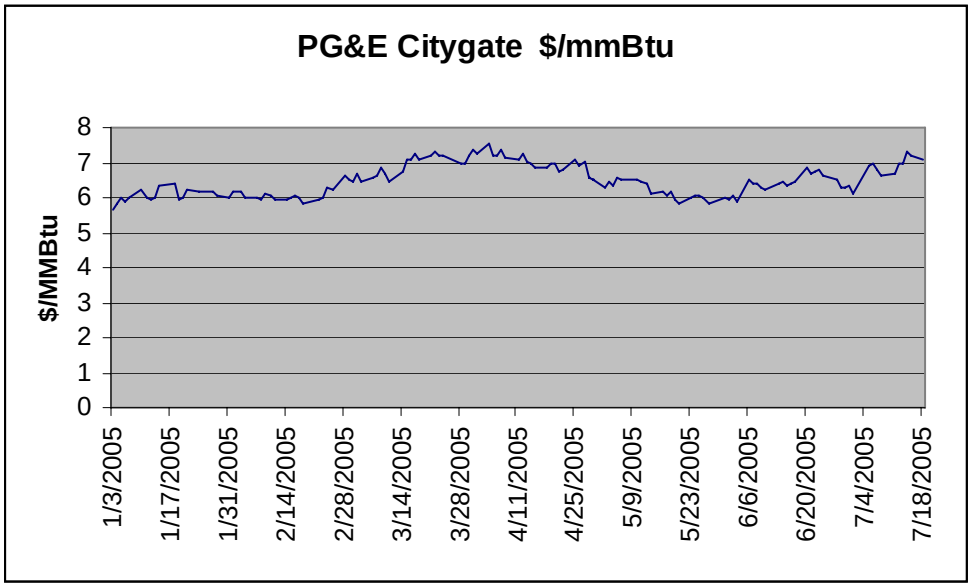
However, the shortcomings in the SMUD analysis described above are overshadowed by two other erroneous assumptions that are critically important to the analysis. SMUD has significantly underestimated 1) the cost of natural gas and 2) the capital costs for new

generation resources. When acquiring a new power supply to meet a new load obligation, the cost of that power supply is critically important. SMUD staff and Global Energy both agree that the primary source of power for the new power supply is new gas fired generation. If one assumes that natural gas prices in 2008 will be significantly below current prices for natural gas and if one assumes the cost of building the plant is half of what is currently being spent for similar plants, the power cost of meeting new load can look fairly attractive. This is what SMUD staff has done.

5.1 CRITIQUE OF SMUD'S ESTIMATES

Natural gas prices at the PG&E Citygate (which location is good for purposes of estimating where gas will need to be delivered [and hence its delivered price] to fuel new gas fired generation in the Sacramento/Yolo vicinity) have ranged between $6 and $7 per MMBtu this year, as Figure 5-1 illustrates. These are unhedged gas prices, leaving them subject to significant volatility as indicated by the swings on Figure 5-1.

Figure 5-1: PG&E Citygate Natural Gas Prices, 2005



The recent California Energy Commission (CEC) Preliminary Reference Case in Support of the 2005 Natural Gas Market Assessment (Figure 5-5) forecasts that natural gas prices at the PG&E Citygate will be $6.75 in 2008 ($2004) and will continue to rise in future years. The $6.75 falls in line with prices so far in 2005 as indicated inFigure 5-1. Despite these indicators (including NYMEX gas futures) that natural gas prices may well be near $7/MMBtu in 2008 and beyond, the SMUD staff analysis assumes that gas prices will be significantly lower than the numbers used by Global Energy (which came from the CPUC officially-adopted Market Price Referent dated February 10, 2005).

Table 5-2: Comparison of Natural Gas Price Forecasts

Year	SMUD gas price forecast (nominal)	Global Energy/MPR gas price assumption (nominal)	CEC Staff forecast June 2005 ($2004)	CEC Staff forecast June 2005 (2.2%inflation) (nominal)
2008	4.92	5.3	6.75	7.36
2009	4.81	5.51	6.85	7.64
2010	4.89	5.68	6.75	7.69
2011	5.10	5.78	7.60	8.85
2012	5.12	5.77	8.50	10.12

As the table above illustrates, the natural gas price forecast used by SMUD staff is very low and should be considered an unrealistic forecast. As compared to the new CEC forecast, even the Global Energy analysis looks optimistic. Given fundamental changes in the natural gas market that are recognized throughout the industry, the SMUD staff forecast misrepresents the expected costs of power and is a key criticism of the SMUD staff analysis. We note that SMUD used a more recent (higher) natural gas price forecast for purposes of indicating a need to a rate increase for existing customers. It seems odd that SMUD would use a more recent (higher) natural gas price forecast for purposes of indicating a need to a rate increase for existing customers while, at a later date, using an older (lower) natural gas price forecast for purposes of Staff's April 18 report to the Board on the cost of serving Yolo load. [7]

As indicated in the Global Energy analysis, simply adjusting gas prices from the low levels used by SMUD staff to the MPR levels used by Global Energy will have a significantly adverse impact on the economics of an annexation of Yolo by SMUD. Global Energy estimates that correcting SMUD's gas price forecast to the MPR forecast would increase SMUD's cost of serving the Yolo annexation load by approximately $100 million. If CEC's latest forecast of gas prices are used rather than the MPR forecast, the economics would be overwhelming against a Yolo annexation by SMUD, resulting in a cost increase to SMUD of over $600 million.

5.2 CAPITAL COSTS OF GAS-FIRED GENERATION

SMUD staff and Global Energy both assumed that new simple cycle and combined cycle gas fired generation would be the most likely technologies for new power supply for SMUD to use to meet a new Yolo county load obligation. Because of the low load factor involved (e.g. 43% load factor), much of the new generation will be simple cycle gas turbine generation. SMUD staff and Global Energy both relied on the CPUC Market Price

[7] Further, the market has moved up significantly since November 2004, and so have public forecasts by CEC,CPUC, Global Energy and others. The reality of higher gas prices and resultant impacts on economics of SMUD annexation of Yolo should be well understood.

Referent cost of construction simple cycle gas turbine generator. The construction cost of such a generator is estimated to be $556/kw ($2004).

Global Energy assumed that SMUD would need to carry 100% of these simple cycle gas turbine capital costs for the new supplies needed to meet Yolo load. However, SMUD staff assumed that SMUD would only need to carry 50% of these costs. The reason given by SMUD staff for including only half the CTs' capital cost was that SMUD staff assumed that some other entity (e.g., a winter peaking entity) could be enlisted to pay the other half. While the idea is plausible, such an arrangement would require a willing counter party and a firm transmission agreement to ensure the peaking power can reach each party's load. In our opinion, it is unlikely that a willing counter party would be found or that such quantities of firm transmission are available. However, while staff nonetheless relied upon the potential benefits associated with this scenario, it did not include any cost for firm transmission.

5.3 CORRECTING FOR SMUD STAFF ERRORS

If SMUD staff analysis was modified to reflect the better assumptions that Global Energy made for natural gas prices and cost of gas turbines generation, the SMUD staff developed cost for serving Yolo load would need to be increased by approximately $180 million (NPV). If gas prices evolve at the currently anticipated levels and if SMUD ultimately cannot find a third party to pay for one-half the capital cost of new gas turbines needed to serve Yolo, the Board will likely find itself in the untenable position of choosing between breaking its promise to current SMUD customers or new Yolo customers or both.

5.4 SMUD STAFF DEFENSE OF THEIR ERRORS

SMUD has taken the position that errors in their gas price estimates and their assumptions regarding only needing to pay for half the capital cost of CTs are immaterial, claiming that fixing these errors would also result in SMUD staff's forecast of PG&E rates increasing.[8] This is not a credible defense for not fixing these materially significant errors. While SMUD staff has not provided the methodology or model that it used to forecast PG&E rates (despite our requests for their analysis) SMUD staff explained that, in its analysis, if gas prices increase by $1/mmbtu for Yolo load served by SMUD, PG&E's fuel-related costs would go up by $0.65. Global Energy has performed an analysis of PG&E power costs for the year 2008 under two gas price scenarios, using publicly available information. The first scenario utilized Global's current gas price forecast while the second scenario increased gas prices by $1/mmbtu. The results from these two scenarios indicated no meaningful change in PG&E's costs. This result occurs because PG&E is "long" on power during the light load (off-peak) hours, hours when higher gas

[8] In forecasting PG&E rates, Staff apparently used the low gas price forecast and assumed any new GTs PG&E would require could be acquired by PG&E at half the capital cost.

prices translate into higher spot power prices. Therefore, while PG&E's costs do increase somewhat with the $1/mmbtu increase in natural gas prices, these costs are largely offset by the higher sales revenue PG&E derives from the higher light load hour spot power prices. The net result is a $0.15 increase in costs for each $1/mmbtu increase in gas prices. SMUD staff confirmed that it did not reflect PG&E light load hour sales when it did its analysis.

SMUD should update its assumptions for gas prices and include all costs of gas turbines needed to meet Yolo load. If SMUD makes adjustments to PG&E costs to reflect these changes, SMUD should be more realistic about PG&E's load resource situation, including the facts that (a) PG&E will make light load hour sales, and (b) PG&E's need for peaking capacity is much less (on a percentage basis) than SMUD will need for Yolo.

5.5 PROBLEMS WITH SMUD SURCHARGE PRINCIPLES

It is clear that SMUD has substantially underestimated the cost of providing power to the Yolo area. Based on Global Energy review of Principle 3c of the July 14 Surcharge Principles, which relates to power costs required to serve the Yolo load, Global Energy believes current SMUD customers would end up covering a significant share of these additional costs, by subsidizing Yolo customers by approximately $300 200? (using MPR..100 gas + 100 50%of GT) or 250 (using CEC) million (NPV). This result would run counter to Condition 1 of the Board Resolution Number 05-05-08 (May 19, 2005) which stated "Existing SMUD customers shall be held harmless as a result of annexation of the Cities of West Sacramento, Davis and Woodland into SMUD's electric service area."

Furthermore, based on recent gas price forecasts produced by the California Energy Commission staff and actual current forward market prices, it appears the Yolo surcharge may well include additional costs associated with natural gas costs in excess of $1/MMbtu above the levels included in the April 18 SMUD staff study. As a result, it looks extremely likely that Yolo customers would see a large increase (as opposed to a modest decrease) compared to PG&E's rates.

Finally, it seems odd that SMUD used a more recent (higher) natural gas price forecast for purposes of indicating a need to a rate increase for existing customers while, at a later date, using an older (lower) natural gas price forecast for purposes of Staff's April 18 report to the Board on the cost of serving Yolo load. More recently, despite continuing increases in natural gas prices, SMUD staff further reduced its estimate of Yolo power costs in its filing with LAFCO. SMUD staff has indicated an unwillingness to explain the basis for this reduction.

<u>Costs to SMUD Customers</u>

Principle 3c of the Proposed Terms and Conditions for LAFCO Application reads:

> "Following the Yolo territory election addressing annexation, SMUD will acquire energy resources to serve the Yolo Customers and to the extent reasonable and prudent will fix the cost of all or a portion of the energy resources. In fixing the cost of the energy resources, if the forward price of natural gas is more than $1 per MMBtu above the natural gas price assumed in the April 2005 SMUD Staff Assessment and Recommendation (SMUD Staff Assessment), the Surcharge Amount shall be increased to include the impact of natural gas prices (in excess of the assumed price plus $1 per MMBtu) on the estimated economic benefits of the annexation."

Global Energy's April 28, 2005 letter to Jim Tracy stated that fully blending the SMUD and Yolo power costs would cost current SMUD customers approximately $211 million (NPV) over 20 years. This number reflected the 2005 CPUC Market Price Referent (MPR) gas price (published by the Energy Division on February 11, and adopted by the Commission on July 21), and was derived by comparing the per unit cost of power for meeting SMUD-only load with per unit cost of power for meeting SMUD-plus-Yolo load. Global then multiplied the SMUD-only load times the increase in power cost to derive the total shift in costs to be borne by current SMUD customers.

The gas price forecast used in this earlier calculation averages $0.67/MMBtu higher than the gas price used in the SMUD staff study. If the gas price were $1/MMBtu higher (rather than $0.67 higher), the cost shift to current SMUD customers would be higher by approximately $25 million. As discussed below, it appears likely that this $1/MMBtu threshold would be triggered. Furthermore, if the Yolo load factor is 43% as assumed by SMUD, rather than the more conservative load factor Global used, then more capital/fixed charges would be needed and the subsidy paid by current SMUD customers would be even higher (approximately a $47 million increase).

Thus, based on today's accepted natural gas price projections, Principle 3c would impose a total cost on current SMUD customers of $200 (MPR)..250 (CEC) million (NPV). This is significantly higher than the estimated $91 million "economy of scale" savings staff has projected. Furthermore, this estimate ignores the costs associated with Principle 3c's requirement to fix the costs of energy resources once the Yolo election is over. Fixing future gas costs would not come without a cost, and if SMUD ultimately chooses to not proceed with the annexation, these hedging costs would be borne by current SMUD customers.

Impact on Yolo Customers

The April 2005 SMUD Staff Assessment relies on a gas price forecast that is outdated and very low in comparison to gas price indicators available today. The SMUD staff forecast assumed gas prices would be less than $5/MMbtu in 2008 (in nominal dollars). It is somewhat puzzling that SMUD would continue to rely on a forecast developed in September 2004 (by Global Energy, in fact), when the SMUD Board Finance Committee considered more current gas price forecasts in its November 9, 2004 meeting to set the context for a 6% rate increase to its current customers.

Today, however, the NYMEX future strip for gas delivery in 2008 is above $8/MMbtu. The California Energy Commission Staff Report dated June 2005 forecasts that gas prices for delivery to SMUD would be approximately $6.70/MMBtu in 2008 (see Figure 5-5, p. 45). Since this is expressed in 2004 dollars, an assumed 2 % annual inflation results in $7.25/MMbtu in nominal dollars, or an increase of over $2.25/MMbtu over the SMUD staff estimate. Based on these indicators, unless the market turns dramatically, the $1/MMbtu trigger in Principle 3c would be surpassed, and would result in higher prices to Yolo customers.

Using the CEC forecast as a basis for estimating the amounts above the $1/MMbtu trigger, Global has estimated the total additional costs to Yolo customers as in excess of $700 (950 total less 250 carried by SMUD customers) million (NPV). Holding everything else equal, this would eliminate the estimated 2% savings, and in fact end up setting rates to Yolo customers significantly above PG&E's rates.

SMUD Refusal to Share Information

Despite continuing increases in natural gas prices, SMUD staff reduced its estimate of Yolo power costs in it's filing with LAFCO (as compared to its April 2005 report to the Board). Global Energy is currently unclear on exactly what SMUD staff did (data and methodology) that reduced such power cost in the LAFCO filing. Global Energy recently requested information related to these revised numbers. Earlier this year SMUD staff indicated a desire to share information on what differences in methodology and data caused Global Energy and SMUD staff to derive different costs of serving Yolo load. However, SMUD staff has recently indicated that "continuing discussion of these issues does not seem fruitful."

6 APPENDIX – RESULTS TABLES

Table A-1: Resource Requirements (MW): SMUD-Only Case

RESOURCE REQUIREMENTS	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
SMUD-Only Demand (MW)	3,112	3,173	3,234	3,295	3,353	3,411	3,479	3,549	3,620	3,692	3,766	3,841	3,918	3,997	4,076	4,158	4,241	4,326	4,412	4,501
Reserve Margin, 15%	467	476	485	494	503	512	522	532	543	554	565	576	588	600	611	624	636	649	662	675
Total SMUD+Yolo Resource Needs (MW	3,579	3,649	3,719	3,789	3,856	3,923	4,001	4,081	4,163	4,246	4,331	4,417	4,506	4,597	4,687	4,782	4,877	4,975	5,074	5,176
SUPPLY RESOURCES																				
SMUD-owned Hydro																				
Camino	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150
Jaybird	152	152	152	152	152	152	152	152	152	152	152	152	152	152	152	152	152	152	152	152
Jones Fork	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Loon Lake	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82
Robbs Peak	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25
Slab Creek	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Union Valley	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47
White Rock	224	224	224	224	224	224	224	224	224	224	224	224	224	224	224	224	224	224	224	224
Hydro Total	**692**	**692**	**692**	**692**	**692**	**692**	**692**	**692**	**692**	**692**	**692**	**692**	**692**	**692**	**692**	**692**	**692**	**692**	**692**	**692**
SMUD-owned Renewable																				
Solano Wind	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Photovoltaic	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Renewable Total	**112**	**113**	**114**	**115**	**116**	**117**	**118**	**119**	**120**	**121**	**122**	**123**	**124**	**125**	**126**	**127**	**128**	**129**	**130**	**131**
SMUD-owned Thermal																				
McClellan Peaker	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72
New CT Capacity	900	1,000	1,100	1,250	1,350	1,350	1,350	1,600	1,700	1,800	1,850	1,950	2,050	2,050	2,050	2,050	2,050	2,050	2,250	2,350
Thermal Total	**972**	**1,072**	**1,172**	**1,322**	**1,422**	**1,422**	**1,422**	**1,672**	**1,772**	**1,872**	**1,922**	**2,022**	**2,122**	**2,122**	**2,122**	**2,122**	**2,122**	**2,122**	**2,322**	**2,422**
Joint Powers-Owned Facilities																				
New CC Capacity 1	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500
New CC Capacity 2						250	250	250	250	250	250	250	250	500	500	500	500	500	500	500
New CC Capacity 3																	250	250	500	500
New CC Capacity 4																				
CVFA-Carson Ice	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94
SCA-P&G	163	163	163	163	163	163	163	163	163	163	163	163	163	163	163	163	163	163	163	163
SPA-Campbell Soup	172	172	172	172	172	172	172	172	172	172	172	172	172	172	172	172	172	172	172	172
Joint Powers-Owned Total	**929**	**929**	**929**	**929**	**929**	**1,179**	**1,179**	**1,179**	**1,179**	**1,179**	**1,179**	**1,179**	**1,179**	**1,429**	**1,429**	**1,429**	**1,679**	**1,679**	**1,929**	**1,929**
LT Contracts																				
Wapa 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wapa 2 (energy = fn(hydro))	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400	0	0
PP&L (Coal)	96	96	96	96	96	96	96	0	0	0	0	0	0	0	0	0	0	0	0	0
Snohomish	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PPM Energy 1 (BaseLoad 7x24)	48	48	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PPM Energy 2 (50% CF)	48	48	48	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PPM Energy 3 (SummerPeak 6x16)	95	95	95	95	95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PPM Energy 4 (Wind)	75	75	75	75	75	75	75	0	0	0	0	0	0	0	0	0	0	0	0	0
City of Klamath Fall 1 (50% CF)	48	48	48	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
City of Klamath Falls 2 (Summer Peak 6x	29	29	29	29	29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Morgan Stanley (On Peak Firm) 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Morgan Stanley (On Peak Firm) 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CDWR Exchange (Summer Peak 6x16)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kiefer Landfill (biomass)	8	8	8	8	8	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Camp Far West (hydro)	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
LT Contracts Total	**853**	**853**	**805**	**709**	**709**	**585**	**577**	**406**	**406**	**406**	**406**	**406**	**406**	**406**	**406**	**406**	**406**	**406**	**6**	**6**
ST Market Purchases	22	-9	8	22	-12	-72	13	14	-6	-24	10	-5	-17	-177	-87	6	-150	-53	-5	-4
Total SMUD Resources	**3,579**	**3,649**	**3,719**	**3,789**	**3,856**	**3,923**	**4,001**	**4,081**	**4,163**	**4,246**	**4,331**	**4,417**	**4,506**	**4,597**	**4,687**	**4,782**	**4,877**	**4,975**	**5,074**	**5,176**

Table A-2: Resource Requirements (MW): SMUD+Yolo Case

RESOURCE REQUIREMENTS	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
SMUD-Only Demand (MW)	3,112	3,173	3,234	3,295	3,353	3,411	3,479	3,549	3,620	3,692	3,766	3,841	3,918	3,997	4,076	4,158	4,241	4,326	4,412	4,501
Yolo Annexation Demand (MW)	369	381	383	391	398	406	414	429	431	440	448	457	466	475	483	491	500	508	523	525
Total SMUD+Yolo Demand (MW)	3,481	3,554	3,617	3,686	3,751	3,817	3,893	3,978	4,051	4,132	4,214	4,298	4,384	4,472	4,559	4,649	4,741	4,834	4,935	5,026
Reserve Margin, %	522	533	543	553	563	573	584	597	608	620	632	645	658	671	684	697	711	725	740	754
Total SMUD+Yolo Resource Needs (MW)	4,003	4,087	4,160	4,239	4,314	4,390	4,477	4,575	4,659	4,751	4,846	4,943	5,042	5,143	5,243	5,346	5,452	5,559	5,676	5,780
SUPPLY RESOURCES																				
SMUD-owned Hydro																				
Camino	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150
Jaybird	152	152	152	152	152	152	152	152	152	152	152	152	152	152	152	152	152	152	152	152
Jones Fork	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Loon Lake	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82
Robbs Peak	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25
Slab Creek	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Union Valley	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47
White Rock	224	224	224	224	224	224	224	224	224	224	224	224	224	224	224	224	224	224	224	224
Hydro Total	**692**	**692**	**692**	**692**	**692**	**692**	**692**	**692**	**692**	**692**	**692**	**692**	**692**	**692**	**692**	**692**	**692**	**692**	**692**	**692**
SMUD-owned Renewable																				
Solano Wind	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Photovoltaic	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Renewable Total	**112**	**113**	**114**	**115**	**116**	**117**	**118**	**119**	**120**	**121**	**122**	**123**	**124**	**125**	**126**	**127**	**128**	**129**	**130**	**131**
SMUD-owned Thermal																				
McClellan Peaker	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72
New CT Capacity	1,350	1,450	1,550	1,700	1,750	1,750	1,750	1,850	1,950	2,000	2,150	2,200	2,300	2,300	2,300	2,350	2,350	2,350	2,600	2,700
Thermal Total	**1,422**	**1,522**	**1,622**	**1,772**	**1,822**	**1,822**	**1,822**	**1,922**	**2,022**	**2,072**	**2,222**	**2,272**	**2,372**	**2,372**	**2,372**	**2,422**	**2,422**	**2,422**	**2,672**	**2,772**
Joint Powers-Owned Facilities																				
New CC Capacity 1	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500
New CC Capacity 2						500	500	500	500	500	500	500	500	500	500	500	500	500	500	500
New CC Capacity 3														250	250	250	500	500	500	500
New CC Capacity 4																			250	250
CVFA-Carson Ice	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94
SCA-P&G	163	163	163	163	163	163	163	163	163	163	163	163	163	163	163	163	163	163	163	163
SPA-Campbell Soup	172	172	172	172	172	172	172	172	172	172	172	172	172	172	172	172	172	172	172	172
Joint Powers-Owned Total	**929**	**929**	**929**	**929**	**929**	**1,429**	**1,429**	**1,429**	**1,429**	**1,429**	**1,429**	**1,429**	**1,429**	**1,679**	**1,679**	**1,679**	**1,929**	**1,929**	**2,179**	**2,179**
LT Contracts																				
Wapa 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wapa 2 (energy = fn(hydro))	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400	0	0
PP&L (Coal)	96	96	96	96	96	96	96	0	0	0	0	0	0	0	0	0	0	0	0	0
Snohomish	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PPM Energy 1 (BaseLoad 7x24)	48	48	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PPM Energy 2 (50% CF)	48	48	48	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PPM Energy 3 (SummerPeak 6x16)	95	95	95	95	95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PPM Energy 4 (Wind)	75	75	75	75	75	75	75	0	0	0	0	0	0	0	0	0	0	0	0	0
City of Klamath Fall 1 (50% CF)	48	48	48	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
City of Klamath Falls 2 (Summer Peak 6x1	29	29	29	29	29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Morgan Stanley (On Peak Firm) 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Morgan Stanley (On Peak Firm) 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CDWR Exchange (Summer Peak 6x16)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kiefer Landfill (biomass)	8	8	8	8	8	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Camp Far West (hydro)	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
LT Contracts Total	**853**	**853**	**805**	**709**	**709**	**585**	**577**	**406**	**406**	**406**	**406**	**406**	**406**	**406**	**406**	**406**	**406**	**406**	**6**	**6**
ST Market Purchases	-4	-22	-2	22	46	-255	-160	7	-10	32	-24	21	19	-131	-32	21	-125	-19	-3	0
Total SMUD Resources	**4,003**	**4,087**	**4,160**	**4,239**	**4,314**	**4,390**	**4,477**	**4,575**	**4,659**	**4,751**	**4,846**	**4,943**	**5,042**	**5,143**	**5,243**	**5,346**	**5,452**	**5,559**	**5,676**	**5,780**

Table A-3: Resource Dispatch Results (GWh): SMUD-Only Case

LOAD (GWh)	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
SMUD-Only Demand (GWh)	11,636	11,822	12,051	12,269	12,520	12,720	12,984	13,233	13,493	13,762	14,036	14,324	14,633	14,902	15,197	15,499	15,811	16,148	16,455	16,783
Yolo Annexation Demand (GWh)																				
Total SMUD Demand (GWh)	11,636	11,822	12,051	12,269	12,520	12,720	12,984	13,233	13,493	13,762	14,036	14,324	14,633	14,902	15,197	15,499	15,811	16,148	16,455	16,783
SUPPLY RESOURCES																				
SMUD-owned Hydro																				
Camino	363	363	363	363	363	363	363	363	363	363	363	363	363	363	363	363	363	363	363	363
Jaybird	532	532	532	532	532	532	532	532	532	532	532	532	532	532	532	532	532	532	532	532
Jones Fork	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22
Loon Lake	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97
Robbs Peak	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49
Slab Creek	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Union Valley	118	118	118	118	118	118	118	118	118	118	118	118	118	118	118	118	118	118	118	118
White Rock	545	545	545	545	545	545	545	545	545	545	545	545	545	545	545	545	545	545	545	545
Hydro Total	**1,728**	**1,728**	**1,728**	**1,728**	**1,728**	**1,728**	**1,728**	**1,728**	**1,728**	**1,728**	**1,728**	**1,728**	**1,728**	**1,728**	**1,728**	**1,728**	**1,728**	**1,728**	**1,728**	**1,728**
SMUD-owned Renewable																				
Solano Wind	286	286	286	286	286	286	286	286	286	286	286	286	286	286	286	286	286	286	286	286
Photovoltaic	31	33	35	37	39	42	44	46	48	50	52	54	56	58	60	62	64	66	68	70
Renewable Total	**317**	**319**	**321**	**323**	**325**	**328**	**330**	**332**	**334**	**336**	**338**	**340**	**342**	**344**	**346**	**348**	**350**	**352**	**354**	**356**
SMUD-owned Thermal																				
McClellan Peaker	16	16	24	41	58	63	68	79	86	87	91	91	93	84	91	92	88	89	87	88
New CT Capacity	137	159	239	414	710	862	1,072	1,737	2,273	2,725	2,878	3,106	3,161	3,034	3,390	4,411	3,878	4,029	3,791	3,947
Thermal Total	**153**	**175**	**263**	**455**	**768**	**925**	**1,140**	**1,816**	**2,359**	**2,812**	**2,969**	**3,197**	**3,254**	**3,118**	**3,481**	**4,503**	**3,966**	**4,118**	**3,878**	**4,034**
Joint Powers-Owned Facilities																				
New CC Capacity 1	3,098	3,062	3,226	3,521	3,750	3,761	3,792	3,840	3,868	3,865	3,885	3,882	3,908	3,900	3,897	3,904	3,919	3,907	3,917	3,914
New CC Capacity 2						1,744	1,779	1,801	1,827	1,890	1,912	1,903	1,929	3,752	3,811	3,859	3,866	3,878	3,894	3,893
New CC Capacity 3																	1,879	1,882	3,737	3,764
New CC Capacity 4																				
CVFA-Carson Ice	338	339	351	367	384	411	426	441	456	451	460	462	457	477	486	510	516	513	512	510
SCA-P&G	501	507	552	617	663	722	757	772	803	794	807	799	809	813	836	850	867	861	860	858
SPA-Campbell Soup	910	913	961	1,011	1,051	1,080	1,105	1,114	1,134	1,127	1,120	1,118	1,122	1,133	1,147	1,149	1,153	1,149	1,152	1,150
Joint Powers-Owned Total	**4,848**	**4,821**	**5,090**	**5,516**	**5,848**	**7,718**	**7,858**	**7,968**	**8,087**	**8,127**	**8,185**	**8,164**	**8,225**	**10,075**	**10,176**	**10,272**	**12,199**	**12,190**	**14,071**	**14,089**
LT Contracts																				
Wapa 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wapa 2 (energy = fn(hydro))	1,130	1,130	1,130	1,130	1,130	1,130	1,130	904	904	904	904	904	904	904	904	904	904	904	0	0
PP&L (Coal)	356	355	355	355	356	355	355	0	0	0	0	0	0	0	0	0	0	0	0	0
Snohomish	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PPM Energy 1 (BaseLoad 7x24)	419	418	207	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PPM Energy 2 (50% CF)	311	304	330	161	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PPM Energy 3 (SummerPeak 6x16)	200	200	200	200	160	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PPM Energy 4 (Wind)	659	657	657	657	328	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
City of Klamath Fall 1 (50% CF)	329	319	343	165	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
City of Klamath Falls 2 (Summer Peak 6	60	60	60	60	60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Morgan Stanley (On Peak Firm) 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Morgan Stanley (On Peak Firm) 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CDWR Exchange (Summer Peak 6x16)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kiefer Landfill (biomass)	70	70	70	70	70	70	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Camp Far West (hydro)	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21
LT Contracts Total	**3,556**	**3,534**	**3,375**	**2,821**	**2,125**	**1,577**	**1,506**	**925**	**925**	**925**	**925**	**925**	**925**	**925**	**925**	**925**	**925**	**925**	**21**	**21**
ST Market Purchases	1,263	1,416	1,469	1,637	2,002	1,161	1,166	1,492	1,430	1,441	1,532	1,654	1,823	959	961	844	390	461	348	398
ST Market Sales	-229	-171	-194	-210	-276	-716	-745	-1,028	-1,371	-1,607	-1,640	-1,684	-1,664	-2,246	-2,421	-3,120	-3,748	-3,627	-3,944	-3,843
Total SMUD Resources	**11,636**	**11,822**	**12,051**	**12,269**	**12,520**	**12,720**	**12,984**	**13,233**	**13,493**	**13,762**	**14,036**	**14,324**	**14,633**	**14,902**	**15,197**	**15,499**	**15,811**	**16,148**	**16,455**	**16,783**

Table A-4: Resource Dispatch Results (GWh): SMUD+Yolo Case

LOAD (GWh)	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
SMUD-Only Demand (GWh)	11,636	11,822	12,051	12,269	12,520	12,720	12,984	13,233	13,493	13,762	14,036	14,324	14,633	14,902	15,197	15,499	15,811	16,148	16,455	16,783
Yolo Annexation Demand (GWh)	1,381	1,423	1,434	1,462	1,490	1,519	1,549	1,604	1,612	1,644	1,676	1,709	1,744	1,775	1,806	1,836	1,868	1,898	1,957	1,963
Total SMUD Demand (GWh)	13,017	13,245	13,485	13,731	14,010	14,240	14,533	14,837	15,105	15,406	15,713	16,033	16,377	16,678	17,003	17,335	17,679	18,046	18,413	18,747
SUPPLY RESOURCES																				
SMUD-owned Hydro																				
Camino	363	363	363	363	363	363	363	363	363	363	363	363	363	363	363	363	363	363	363	363
Jaybird	532	532	532	532	532	532	532	532	532	532	532	532	532	532	532	532	532	532	532	532
Jones Fork	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22
Loon Lake	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97
Robbs Peak	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49
Slab Creek	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Union Valley	118	118	118	118	118	118	118	118	118	118	118	118	118	118	118	118	118	118	118	118
White Rock	545	545	545	545	545	545	545	545	545	545	545	545	545	545	545	545	545	545	545	545
Hydro Total	**1,728**	**1,728**	**1,728**	**1,728**	**1,728**	**1,728**	**1,728**	**1,728**	**1,728**	**1,728**	**1,728**	**1,728**	**1,728**	**1,728**	**1,728**	**1,728**	**1,728**	**1,728**	**1,728**	**1,728**
SMUD-owned Renewable																				
Solano Wind	286	286	286	286	286	286	286	286	286	286	286	286	286	286	286	286	286	286	286	286
Photovoltaic	31	33	35	37	39	42	44	46	48	50	52	54	56	58	60	62	64	66	68	70
Renewable Total	**317**	**319**	**321**	**323**	**325**	**328**	**330**	**332**	**334**	**336**	**338**	**340**	**342**	**344**	**346**	**348**	**350**	**352**	**354**	**356**
SMUD-owned Thermal																				
McClellan Peaker	25	24	33	51	66	60	67	78	84	86	89	89	92	84	90	92	90	91	88	89
New CT Capacity	259	297	393	626	993	855	1,083	1,681	2,190	2,628	2,810	3,053	3,137	2,989	3,356	4,402	3,821	3,986	3,725	3,904
Thermal Total	**284**	**320**	**426**	**676**	**1,059**	**915**	**1,150**	**1,759**	**2,274**	**2,714**	**2,899**	**3,143**	**3,229**	**3,073**	**3,446**	**4,494**	**3,911**	**4,077**	**3,813**	**3,993**
Joint Powers-Owned Facilities																				
New CC Capacity 1	3,494	3,411	3,566	3,683	3,784	3,789	3,820	3,825	3,877	3,875	3,884	3,895	3,901	3,881	3,911	3,936	3,941	3,931	3,927	3,895
New CC Capacity 2						3,475	3,572	3,711	3,752	3,749	3,812	3,843	3,843	3,831	3,886	3,905	3,914	3,911	3,910	3,904
New CC Capacity 3														1,825	1,860	1,900	3,747	3,763	3,797	3,838
New CC Capacity 4																			1,879	1,874
CVFA-Carson Ice	339	339	352	367	387	409	427	442	455	454	462	463	462	477	484	510	516	513	512	509
SCA-P&G	502	507	553	613	664	721	762	773	805	798	811	800	813	809	829	858	864	860	859	856
SPA-Campbell Soup	910	912	961	1,011	1,050	1,079	1,102	1,114	1,139	1,124	1,125	1,117	1,121	1,133	1,142	1,149	1,154	1,150	1,146	1,147
Joint Powers-Owned Total	**5,244**	**5,169**	**5,433**	**5,674**	**5,885**	**9,473**	**9,683**	**9,866**	**10,028**	**10,000**	**10,093**	**10,117**	**10,140**	**11,955**	**12,112**	**12,258**	**14,135**	**14,128**	**16,031**	**16,023**
LT Contracts																				
Wapa 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wapa 2 (energy = fn(hydro))	1,130	1,130	1,130	1,130	1,130	1,130	1,130	904	904	904	904	904	904	904	904	904	904	904	0	0
PP&L (Coal)	356	355	355	355	356	355	355	0	0	0	0	0	0	0	0	0	0	0	0	0
Snohomish	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PPM Energy 1 (BaseLoad 7x24)	419	418	207	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PPM Energy 2 (50% CF)	332	332	340	168	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PPM Energy 3 (SummerPeak 6x16)	200	200	200	200	160	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PPM Energy 4 (Wind)	659	657	657	657	328	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
City of Klamath Fall 1 (50% CF)	335	327	344	167	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
City of Klamath Falls 2 (Summer Peak 6x16)	60	60	60	60	60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Morgan Stanley (On Peak Firm) 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Morgan Stanley (On Peak Firm) 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CDWR Exchange (Summer Peak 6x16)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kiefer Landfill (biomass)	70	70	70	70	70	70	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Camp Far West (hydro)	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21
LT Contracts Total	**3,584**	**3,570**	**3,386**	**2,830**	**2,125**	**1,577**	**1,506**	**925**	**925**	**925**	**925**	**925**	**925**	**925**	**925**	**925**	**925**	**925**	**21**	**21**
ST Market Purchases	1,938	2,205	2,256	2,605	3,102	1,025	1,039	1,300	1,225	1,337	1,421	1,512	1,702	921	932	801	388	473	315	388
ST Market Sales	-79	-67	-64	-105	-215	-805	-903	-1,073	-1,410	-1,633	-1,691	-1,731	-1,688	-2,268	-2,487	-3,219	-3,759	-3,637	-3,850	-3,762
Total SMUD Resources	**13,017**	**13,245**	**13,485**	**13,731**	**14,010**	**14,240**	**14,533**	**14,837**	**15,105**	**15,406**	**15,713**	**16,033**	**16,377**	**16,678**	**17,003**	**17,335**	**17,679**	**18,046**	**18,413**	**18,747**

Table A-5: Power Cost to Serve Load Results ($000): SMUD-Only Case

Power Cost to Serve Load ($000)	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
SUPPLY RESOURCES																				
SMUD-owned Hydro																				
Camino	2,213	2,249	2,322	2,394	2,431	2,503	2,576	2,612	2,685	2,757	2,830	2,902	2,975	3,048	3,120	3,193	3,265	3,374	3,447	3,519
Jaybird	3,246	3,299	3,405	3,512	3,565	3,671	3,778	3,831	3,938	4,044	4,150	4,257	4,363	4,470	4,576	4,682	4,789	4,949	5,055	5,161
Jones Fork	132	135	139	143	145	150	154	156	161	165	169	174	178	182	187	191	195	202	206	210
Loon Lake	593	603	622	642	651	671	690	700	719	739	758	778	797	816	836	855	875	904	923	943
Robbs Peak	300	304	314	324	329	339	349	354	363	373	383	393	403	412	422	432	442	457	466	476
Slab Creek	8	8	8	9	9	9	9	9	10	10	10	11	11	11	11	12	12	12	12	13
Union Valley	722	733	757	781	793	816	840	852	875	899	923	946	970	994	1,017	1,041	1,065	1,100	1,124	1,148
White Rock	3,327	3,381	3,491	3,600	3,654	3,763	3,872	3,927	4,036	4,145	4,254	4,363	4,472	4,581	4,690	4,800	4,909	5,072	5,181	5,290
Hydro Total	**10,540**	**10,713**	**11,059**	**11,404**	**11,577**	**11,923**	**12,268**	**12,441**	**12,787**	**13,132**	**13,478**	**13,823**	**14,169**	**14,514**	**14,860**	**15,206**	**15,551**	**16,070**	**16,415**	**16,761**
SMUD-owned Renewable																				
Solano Wind	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Photovoltaic	40	43	47	51	55	61	65	70	75	80	85	90	96	102	108	114	121	128	135	143
Renewable Total	**40**	**43**	**47**	**51**	**55**	**61**	**65**	**70**	**75**	**80**	**85**	**90**	**96**	**102**	**108**	**114**	**121**	**128**	**135**	**143**
SMUD-owned Thermal																				
McClellan Peaker	948	995	1,453	2,472	3,428	3,768	4,159	4,999	5,542	5,793	6,233	6,485	6,912	6,353	7,118	7,330	7,180	7,559	7,655	7,988
New CT Capacity	82,781	99,121	128,595	170,131	207,321	222,465	242,531	347,544	416,076	477,126	518,007	573,983	614,164	618,343	666,956	781,224	750,065	787,065	836,358	903,391
Thermal Total	**83,729**	**100,115**	**130,048**	**172,603**	**210,749**	**226,233**	**246,690**	**352,542**	**421,618**	**482,920**	**524,240**	**580,468**	**621,076**	**624,696**	**674,074**	**788,554**	**757,246**	**794,625**	**844,013**	**911,379**
Joint Powers-Owned Facilities																				
New CC Capacity 1	127,065	130,970	141,346	156,242	165,622	169,031	174,542	182,770	188,646	192,885	199,927	207,525	218,168	222,945	228,565	234,553	241,693	249,383	258,620	267,448
New CC Capacity 2						78,682	82,271	86,183	89,500	94,458	98,567	101,939	107,874	215,039	223,826	232,171	238,731	247,681	257,205	266,064
New CC Capacity 3																	116,143	120,425	247,443	257,765
New CC Capacity 4																				
CVFA-Carson Ice	15,678	16,362	17,427	18,532	19,370	21,314	22,731	24,530	26,087	26,422	27,917	29,306	30,033	32,450	34,037	37,040	38,494	39,659	40,929	42,120
SCA-P&G	21,643	22,919	25,753	29,370	31,658	35,356	38,203	40,544	43,611	44,085	46,306	47,797	50,636	52,111	55,151	58,080	60,919	62,640	64,777	66,919
SPA-Campbell Soup	37,629	39,397	42,814	45,825	47,566	49,872	52,285	54,606	57,002	58,035	59,557	61,829	64,895	67,113	69,738	71,609	73,836	76,196	79,057	81,762
New CC Levelized Costs	44,108	45,211	46,341	47,500	48,687	74,857	76,728	78,646	80,613	82,628	84,694	86,811	88,981	121,608	124,648	127,764	163,698	167,790	206,382	211,542
Joint Powers-Owned Total	**246,124**	**254,859**	**273,681**	**297,470**	**312,904**	**429,112**	**446,761**	**467,279**	**485,459**	**498,513**	**516,968**	**535,206**	**560,587**	**711,266**	**735,964**	**761,218**	**933,514**	**963,773**	**1,154,413**	**1,193,620**
LT Contracts																				
Wapa 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wapa 2 (energy = fn(hydro))	6,893	7,006	7,232	7,458	7,571	7,797	8,023	6,508	6,689	6,870	7,051	7,232	7,413	7,593	7,774	7,955	8,136	8,407	0	0
PP&L (Coal)	9,282	9,627	9,925	10,098	10,104	10,267	10,529	0	0	0	0	0	0	0	0	0	0	0	0	0
Snohomish	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PPM Energy 1 (BaseLoad 7x24)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PPM Energy 2 (50% CF)	12,399	12,643	14,070	6,869	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PPM Energy 3 (SummerPeak 6x16)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PPM Energy 4 (Wind)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
City of Klamath Fall 1 (50% CF)	13,147	13,246	14,616	7,046	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
City of Klamath Falls 2 (Summer Peak 6x16)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Morgan Stanley (On Peak Firm) 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Morgan Stanley (On Peak Firm) 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CDWR Exchange (Summer Peak 6x16)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kiefer Landfill (biomass)	4,492	4,592	4,707	4,825	4,956	5,064	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Camp Far West (hydro)	128	131	135	139	141	146	150	152	156	160	164	169	173	177	181	186	189	196	200	205
LT Contracts Total	**46,342**	**47,245**	**50,685**	**36,434**	**22,772**	**23,273**	**18,701**	**6,660**	**6,845**	**7,030**	**7,215**	**7,400**	**7,585**	**7,770**	**7,955**	**8,140**	**8,325**	**8,603**	**200**	**205**
ST Market Purchases	52,233	59,857	68,089	82,825	105,467	64,408	67,400	88,321	87,464	90,249	99,350	110,597	126,863	69,679	73,707	62,442	29,283	35,987	27,744	33,354
ST Market Sales	-9,616	-7,198	-8,990	-11,637	-18,052	-45,701	-51,057	-79,487	-106,982	-132,744	-140,643	-151,042	-155,843	-205,977	-229,947	-310,008	-364,971	-369,242	-404,588	-409,781
Total SMUD Resources	**429,391**	**465,634**	**524,618**	**589,151**	**645,471**	**709,309**	**740,830**	**847,826**	**907,265**	**959,180**	**1,020,693**	**1,096,543**	**1,174,532**	**1,222,052**	**1,276,722**	**1,325,667**	**1,379,069**	**1,449,944**	**1,638,333**	**1,745,680**

Table A-6: Power Cost to Serve Load Results ($000): SMUD + Yolo Case

Power Cost to Serve Load ($000)	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
SUPPLY RESOURCES																				
SMUD-owned Hydro																				
Camino	2,213	2,249	2,322	2,394	2,431	2,503	2,576	2,612	2,685	2,757	2,830	2,902	2,975	3,048	3,120	3,193	3,265	3,374	3,447	3,519
Jaybird	3,246	3,299	3,405	3,512	3,565	3,671	3,778	3,831	3,938	4,044	4,150	4,257	4,363	4,470	4,576	4,682	4,789	4,949	5,055	5,161
Jones Fork	132	135	139	143	145	150	154	156	161	165	169	174	178	182	187	191	195	202	206	210
Loon Lake	593	603	622	642	651	671	690	700	719	739	758	778	797	816	836	855	875	904	923	943
Robbs Peak	300	304	314	324	329	339	349	354	363	373	383	393	403	412	422	432	442	457	466	476
Slab Creek	8	8	8	9	9	9	9	9	10	10	10	11	11	11	11	12	12	12	12	13
Union Valley	722	733	757	781	793	816	840	852	875	899	923	946	970	994	1,017	1,041	1,065	1,100	1,124	1,148
White Rock	3,327	3,381	3,491	3,600	3,654	3,763	3,872	3,927	4,036	4,145	4,254	4,363	4,472	4,581	4,690	4,800	4,909	5,072	5,181	5,290
Hydro Total	**10,540**	**10,713**	**11,059**	**11,404**	**11,577**	**11,923**	**12,268**	**12,441**	**12,787**	**13,132**	**13,478**	**13,823**	**14,169**	**14,514**	**14,860**	**15,206**	**15,551**	**16,070**	**16,415**	**16,761**
SMUD-owned Renewable																				
Solano Wind	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Photovoltaic	40	43	47	51	55	61	65	70	75	80	85	90	96	102	108	114	121	128	135	143
Renewable Total	**40**	**43**	**47**	**51**	**55**	**61**	**65**	**70**	**75**	**80**	**85**	**90**	**96**	**102**	**108**	**114**	**121**	**128**	**135**	**143**
SMUD-owned Thermal																				
McClellan Peaker	1,434	1,407	1,977	2,997	3,862	3,565	4,104	4,954	5,438	5,678	6,103	6,339	6,794	6,394	7,051	7,335	7,370	7,702	7,757	8,115
New CT Capacity	127,660	146,207	173,672	224,580	263,039	259,008	281,337	367,807	429,804	490,152	528,371	569,524	606,397	608,662	658,097	821,996	787,312	826,652	874,659	951,425
Thermal Total	**129,094**	**147,614**	**175,649**	**227,577**	**266,901**	**262,573**	**285,442**	**372,761**	**435,242**	**495,830**	**534,473**	**575,864**	**613,191**	**615,055**	**665,148**	**829,330**	**794,682**	**834,354**	**882,416**	**959,539**
Joint Powers-Owned Facilities																				
New CC Capacity 1	142,278	145,167	155,463	162,850	166,932	170,057	175,750	182,155	189,074	193,360	199,844	208,280	217,844	221,839	229,331	236,403	243,012	250,835	259,375	266,134
New CC Capacity 2						156,850	165,061	177,017	183,309	187,538	196,488	205,696	214,915	219,279	228,050	234,640	241,446	249,613	258,246	266,785
New CC Capacity 3														104,698	109,472	114,386	231,569	240,623	251,102	262,495
New CC Capacity 4																			124,413	128,388
CVFA-Carson Ice	15,734	16,400	17,520	18,527	19,563	21,201	22,801	24,587	26,042	26,596	28,004	29,316	30,462	32,450	33,877	37,007	38,488	39,612	40,920	42,082
SCA-P&G	21,694	22,948	25,792	29,174	31,688	35,311	38,454	40,715	43,748	44,274	46,616	47,791	50,933	51,855	54,692	58,661	60,686	62,592	64,754	66,781
SPA-Campbell Soup	37,594	39,374	42,814	45,809	47,539	49,812	52,137	54,658	57,271	57,885	59,771	61,752	64,837	67,113	69,501	71,608	73,909	76,248	78,727	81,546
New CC Levelized Costs	44,108	45,211	46,341	47,500	48,687	99,809	102,304	104,862	107,484	110,171	112,925	115,748	118,642	152,010	155,810	159,705	196,437	201,348	240,779	246,798
Joint Powers-Owned Total	**261,408**	**269,100**	**287,931**	**303,859**	**314,409**	**533,040**	**556,508**	**583,994**	**606,927**	**619,823**	**643,647**	**668,583**	**697,633**	**849,244**	**880,733**	**912,411**	**1,085,547**	**1,120,872**	**1,318,316**	**1,361,010**
LT Contracts																				
Wapa 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wapa 2 (energy = fn(hydro))	6,893	7,006	7,232	7,458	7,571	7,797	8,023	6,508	6,689	6,870	7,051	7,232	7,413	7,593	7,774	7,955	8,136	8,407	0	0
PP&L (Coal)	9,282	9,627	9,925	10,098	10,104	10,267	10,529	0	0	0	0	0	0	0	0	0	0	0	0	0
Snohomish	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PPM Energy 1 (BaseLoad 7x24)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PPM Energy 2 (50% CF)	13,247	13,792	14,482	7,164	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PPM Energy 3 (SummerPeak 6x16)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PPM Energy 4 (Wind)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
City of Klamath Fall 1 (50% CF)	13,349	13,566	14,640	7,132	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
City of Klamath Falls 2 (Summer Peak 6x16)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Morgan Stanley (On Peak Firm) 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Morgan Stanley (On Peak Firm) 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CDWR Exchange (Summer Peak 6x16)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kiefer Landfill (biomass)	4,493	4,592	4,707	4,825	4,959	5,064	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Camp Far West (hydro)	128	131	135	139	141	146	150	152	156	160	164	169	173	177	181	186	189	196	200	205
LT Contracts Total	**47,392**	**48,714**	**51,120**	**36,816**	**22,775**	**23,273**	**18,701**	**6,660**	**6,845**	**7,030**	**7,215**	**7,400**	**7,585**	**7,770**	**7,955**	**8,140**	**8,325**	**8,603**	**200**	**205**
ST Market Purchases	80,443	93,223	105,000	129,429	159,164	55,234	57,422	76,006	74,709	82,451	91,632	100,469	117,918	66,917	70,352	58,808	28,638	36,207	24,741	32,085
ST Market Sales	-3,206	-2,929	-3,320	-6,933	-15,611	-51,469	-60,630	-81,825	-109,167	-134,681	-143,502	-153,416	-157,030	-207,486	-233,878	-316,971	-366,339	-370,453	-398,565	-403,134
Total SMUD Resources	**525,711**	**566,480**	**627,485**	**702,203**	**759,269**	**834,634**	**869,775**	**970,107**	**1,027,417**	**1,083,666**	**1,147,028**	**1,212,814**	**1,293,562**	**1,346,117**	**1,405,278**	**1,507,040**	**1,566,526**	**1,645,781**	**1,843,659**	**1,966,608**

Table A-7: Power Cost to Serve Yolo Load Results ($000): Yolo

SMUD-Only	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
CT (levelized) Cost component: $000	74,015	88,509	112,322	141,699	158,858	162,829	166,900	219,950	245,489	267,032
CC (levelized) Cost component: $000	44,108	45,211	46,341	47,500	48,687	74,857	76,728	78,646	80,613	82,628
Total Capital Cost: $000	118,123	133,720	158,664	189,199	207,545	237,686	243,628	298,597	326,102	349,660
Variable Cost component: $000	311,268	331,914	365,954	399,952	437,926	471,623	497,202	549,229	581,164	609,520
Total Cost: $000	**429,391**	**465,634**	**524,618**	**589,151**	**645,471**	**709,309**	**740,830**	**847,826**	**907,265**	**959,180**
CT (levelized) Cost component: $/MWh	6.36	7.49	9.32	11.55	12.69	12.80	12.85	16.62	18.19	19.40
CC (levelized) Cost component: $/MWh	3.79	3.82	3.85	3.87	3.89	5.88	5.91	5.94	5.97	6.00
Total Capital Cost: $/MWh	10.15	11.31	13.17	15.42	16.58	18.69	18.76	22.56	24.17	25.41
Variable Cost component: $/MWh	26.75	28.08	30.37	32.60	34.98	37.08	38.29	41.50	43.07	44.29
Total Cost: $/MWh	**36.90**	**39.39**	**43.53**	**48.02**	**51.55**	**55.76**	**57.06**	**64.07**	**67.24**	**69.70**
	2018	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**
CT (levelized) Cost component: $000	289,499	318,317	342,865	351,437	360,223	369,228	378,459	387,920	448,924	486,441
CC (levelized) Cost component: $000	84,694	86,811	88,981	121,608	124,648	127,764	163,698	167,790	206,382	211,542
Total Capital Cost: $000	374,192	405,128	431,846	473,044	484,870	496,992	542,157	555,710	655,306	697,983
Variable Cost component: $000	646,501	691,415	742,686	749,008	791,851	828,675	836,912	894,234	983,028	1,047,698
Total Cost: $000	**1,020,693**	**1,096,543**	**1,174,532**	**1,222,052**	**1,276,722**	**1,325,667**	**1,379,069**	**1,449,944**	**1,638,333**	**1,745,680**
CT (levelized) Cost component: $/MWh	20.62	22.22	23.43	23.58	23.70	23.82	23.94	24.02	27.28	28.98
CC (levelized) Cost component: $/MWh	6.03	6.06	6.08	8.16	8.20	8.24	10.35	10.39	12.54	12.60
Total Capital Cost: $/MWh	26.66	28.28	29.51	31.74	31.91	32.07	34.29	34.41	39.82	41.59
Variable Cost component: $/MWh	46.06	48.27	50.75	50.26	52.11	53.47	52.93	55.38	59.74	62.42
Total Cost: $/MWh	**72.72**	**76.55**	**80.27**	**82.00**	**84.01**	**85.53**	**87.22**	**89.79**	**99.56**	**104.01**

SMUD+Yolo	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
CT (levelized) Cost component: $000	111,022	126,442	146,883	181,552	195,168	200,047	205,049	244,389	265,529	287,573
CC (levelized) Cost component: $000	44,108	45,211	46,341	47,500	48,687	99,809	102,304	104,862	107,484	110,171
Total Capital Cost: $000	155,130	171,653	193,224	229,052	243,856	299,856	307,353	349,251	373,012	397,743
Variable Cost component: $000	370,581	394,827	434,261	473,151	515,414	534,778	562,423	620,856	654,404	685,922
RPS cost for Yolo Load: $000	1,381	1,423	1,434	1,462	1,490	1,519	1,549	1,604	1,612	1,644
Total Cost: $000	**527,092**	**567,902**	**628,919**	**703,665**	**760,759**	**836,153**	**871,324**	**971,711**	**1,029,028**	**1,085,309**
CT (levelized) Cost component: $/MWh	8.53	9.55	10.89	13.22	13.93	14.05	14.11	16.47	17.58	18.67
CC (levelized) Cost component: $/MWh	3.39	3.41	3.44	3.46	3.48	7.01	7.04	7.07	7.12	7.15
Total Capital Cost: $/MWh	11.92	12.96	14.33	16.68	17.41	21.06	21.15	23.54	24.70	25.82
Variable Cost component: $/MWh	28.47	29.81	32.20	34.46	36.79	37.56	38.70	41.84	43.33	44.52
RPS cost for Yolo Load: $/MWh	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11
Total Cost: $/MWh	**40.49**	**42.88**	**46.64**	**51.25**	**54.30**	**58.72**	**59.95**	**65.49**	**68.13**	**70.45**
	2018	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**
CT (levelized) Cost component: $000	305,289	318,317	337,335	345,768	354,412	410,915	421,188	431,718	493,816	539,029
CC (levelized) Cost component: $000	112,925	115,748	118,642	152,010	155,810	159,705	196,437	201,348	240,779	246,798
Total Capital Cost: $000	418,214	434,065	455,977	497,778	510,222	570,620	617,625	633,066	734,595	785,828
Variable Cost component: $000	728,813	778,749	837,586	848,339	895,055	936,419	948,900	1,012,715	1,109,064	1,180,781
RPS cost for Yolo Load: $000	1,676	1,709	1,744	1,775	1,806	1,836	1,868	1,898	1,957	1,963
Total Cost: $000	**1,148,704**	**1,214,522**	**1,295,307**	**1,347,893**	**1,407,084**	**1,508,875**	**1,568,394**	**1,647,679**	**1,845,616**	**1,968,572**
CT (levelized) Cost component: $/MWh	19.43	19.85	20.60	20.73	20.84	23.70	23.82	23.92	26.82	28.75
CC (levelized) Cost component: $/MWh	7.19	7.22	7.24	9.11	9.16	9.21	11.11	11.16	13.08	13.16
Total Capital Cost: $/MWh	26.62	27.07	27.84	29.85	30.01	32.92	34.94	35.08	39.90	41.92
Variable Cost component: $/MWh	46.38	48.57	51.14	50.87	52.64	54.02	53.67	56.12	60.23	62.99
RPS cost for Yolo Load: $/MWh	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.10
Total Cost: $/MWh	**73.11**	**75.75**	**79.09**	**80.82**	**82.76**	**87.04**	**88.72**	**91.30**	**100.24**	**105.01**

YOLO	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Total Capital Cost: $000	37,007	37,932	34,561	39,853	36,310	62,170	63,725	50,654	46,911	48,084
Total Variable Cost : $000	59,313	62,913	68,307	73,200	77,488	63,154	65,221	71,627	73,240	76,402
RPS Cost for Yolo Load ($000)	1,381	1,423	1,434	1,462	1,490	1,519	1,549	1,604	1,612	1,644
Total Cost: $000	**97,701**	**102,268**	**104,301**	**114,514**	**115,288**	**126,844**	**130,495**	**123,885**	**121,763**	**126,130**
	97701	102268	104301	114514	115288	126844	130495	123885	121763	126130
Total Capital Cost: $/MWh	26.80	26.66	24.11	27.26	24.37	40.92	41.14	31.58	29.11	29.26
Total Variable Cost: $/MWh	42.95	44.22	47.65	50.08	52.01	41.57	42.11	44.66	45.44	46.48
RPS Cost for Yolo Load: $/MWh	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Total Cost: $/MWh	**70.76**	**71.88**	**72.75**	**78.34**	**77.39**	**83.50**	**84.25**	**77.24**	**75.55**	**76.74**
	2018	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**
Total Capital Cost: $000	44,022	28,937	24,130	24,734	25,352	73,628	75,469	77,355	79,289	87,845
Variable Cost component: $000	82,312	87,334	94,900	99,331	103,204	107,745	111,988	118,481	126,036	133,083
RPS Cost for Yolo Load: $000	1,676	1,709	1,744	1,775	1,806	1,836	1,868	1,898	1,957	1,963
Total Cost: $000	**128,011**	**117,980**	**120,774**	**125,840**	**130,362**	**183,208**	**189,325**	**197,735**	**207,283**	**222,891**
Total Capital Cost: $/MWh	26.26	16.93	13.83	13.93	14.04	40.11	40.40	40.75	40.51	44.74
Variable Cost component: $/MWh	49.10	51.11	54.41	55.95	57.15	58.70	59.95	62.42	64.40	67.78
Total Cost: $/MWh	**76.36**	**69.04**	**69.24**	**70.88**	**72.19**	**99.81**	**101.35**	**104.17**	**105.91**	**113.52**

NPV Total Capital Cost: $000	537,106
NPV Variable Cost component: $000	930,951
NPV RPS Cost for Yolo Load: $000	19,039
NPV Total Cost: $000	1,486,509

Levelized Capital Cost: $/MWh	29.11
Levelized Variable Cost: $/MWh	50.45
Leveelized RPS Cost for Yolo: $/MWh	1.03
Levelized Total Cost: $/MWh	**80.56**